Study on Energy Supply Security and Geopolitics

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This study on Energy Supply Security and Geopolitics was conducted by the Clingendael International Energy Programme (CIEP), Institute for International Relations 'Clingendael', The Hague, the Netherlands.

Project leader:
Prof. dr. Coby van der Linde (CIEP)

Research team:
Dr. Mehdi Parvizi Amineh (University of Amsterdam and Leiden)
Dr. Aad Correljé (Technical University Delft)
Dick de Jong MSc (CIEP)

Research assistant:
Sander Hansen LLM MA (CIEP)

Experts:
Prof. Dr. Kurt Deketelaere (KU Leuven, Belgium)
Dr. Peter van Ham (Clingendael)
Kees Homan LLM (Clingendael)
Dr. Paul Meerts (Clingendael)
Prof. Dr. Kurt Radtke (Waseda University, Tokyo, Japan)
Prof. Dr. Jan Rood (Clingendael)
Prof. Dr. Rob de Wijk (Clingendael)

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List of Acronyms

AGT	Azerbaijan-Georgia-Turkey
AIOC	Azerbaijan International Operating Company
AMBO	Albanian-Macedonian-Bulgarian Oil Pipeline Corporation
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
b/d	barrel of 159 liter of oil (product) per day
Bcf	Billion cubic feet
Bcm	Billion cubic meter
BSEC	Black Sea Economic Cooperation Organisation
BSEP	Black Sea Environmental Program
BSREC	Black Sea Regional Energy Centre
BTC	Baku-Tblisi-Ceyhan (oil pipeline)
CBM	Confidence Building Measures
CCGT	Combined Cycle Gas Turbine
CEA	Central Eurasia
CENN	Caucasus Environmental NGO Network
CFP	Compagnie Française des Pétroles
CIS	Commonwealth of Independent States
CNPC	China National Petroleum Corporation
CNOOC	China National Offshore Oil Corporation
CO_2	Carbon Dioxide
COMECON	Council for Mutual Economic Cooperation
COP	Conference of the Parties (of the Kyoto Protocoal)
DSO	Distribution System Operator
EAEC	Eurasian Economic Community
ECCP	European Climate Change Programme
ECFSP	European Common Foreign and Security Policy
ECO	Economic Cooperation Organisation
EEA	European Economic Area
EIA	Energy Information Administration
EMP	Euro-Mediterranean Partnership
EU	European Union
FDI	Foreign Direct Investment
FIS	Front Islamique du Salut (Islamic Salvation Front)
FSU	Former Soviet Union
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GIA	Groupe Islamique Armé (Armed Islamic Group)
GUUAM	Georgia, Ukraine, Uzbekistan, Azerbaijan, Moldova
HT	Hizb-ut Tahrir (Liberation Party)
IAEA	International Atomic Energy Agency

IEA	International Energy Agency
IEF	International Energy Forum
IEP	International Energy Programme
ILSA	Iran-Libya Sanctions Act
IMF	International Monetary Fund
IMU	Islamic Movement of Uzbekistan
INOGATE	Interstate Oil and Gas Transport
IPE	International Political Economy / International Petroleum Exchange
IPT	Islamic Party of Turkestan
IR	International Relations
IRP	Islamic Renaissance Party
ITC	Iraqi Turkoman Front
KADEK	Kurdistan Freedom and Democracy Congress
KDP	Kurdish Democratic Party
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
Mb	Million barrels
Mb/d	Million barrels per day
MEK / MOK	Mujahedin-e Khalq
MEP	Main Export Pipeline
MERCOSUR	Mercado Comun del Sur (Common Market of the South)
MGS	Master Gas System
MMbtu	Million British Thermal Units
MOP	Meeting of the Parties (of the Kyoto Protocol)
Mt	Millions of tonnes
Mtoe	Million tonnes of oil equivalent
Mtpa	Million tonnes per annum
NAFTA	North American Free Trade Association
NATO	North Atlantic Treaty Organization
NGO	Non-governmental organisation
NIMBY	Not In My Back Yard
NOC	National Oil Company
NTPA	Negotiated Third Party Access
NYMEX	New York Mercantile Exchange
OAPEC	Organization of Arab Petroleum Exporting Countries
OECD	Organization for Economic Cooperation and Development
Op. Cit.	Opere Citato
OPEC	Organization of the Petroleum Exporting Countries
OSCE	Organization for Security and Cooperation in Europe
PDVSA	Petróleos de Venezuela
PKK	Partiya Karkeren Kurdistan (Kurdistan Workers Party)
PUK	Patriotic Union of Kurdistan
RTPA	Regulated Third Party Access
SADC	Southern African Development Community

SCIRI	Supreme Council of the Islamic Revolution in Iraq
SCO	Shanghai Cooperation Organization
SCP	South Caucasus Pipeline
Sinopec	China Petroleum & Chemical Corporation
SOCAR	State Oil Company of the Azeri Republic
TACIS	Technical Assistance to the Commonwealth of Independent States
Tcf	Trillion cubic feet
TCGP	Trans-Caspian Gas Pipeline
TNC	Transnational Company
TNOC	Transnational Oil Company
ToR	Terms of reference
TPAO	Turkiye Petrolleri Anonim Ortakligi (Turkish Petroleum Corporation)
TRACECA	Transport Corridor Europe-Caucasus-Central Asia
TSO	Transmission System Operator
TWH	Tera Watt Hour
UAE	United Arab Emirates
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNSC	United Nations Security Council
US	United States of America
WB	World Bank
WMD	Weapons of Mass Destruction
WTO	World Trade Organization
WWII	World War II
XUAR	Xinjiang Uighur Autonomous Region

Executive Summary

Geopolitical developments and energy security

1. The main result of this study on *EU Energy Supply Security and Geopolitics* is that energy must become an integral part of EU external trade and foreign and security policy-making. EU foreign and security policy and external trade policy are crucial energy policy tools to achieve future security of supply.

2. The recommendation to include energy issues more prominently in external trade and foreign and security policy-making is based on the fact that the dependency on imported energies will increase substantially in the coming decades (COM 769 final, 2000) and that the uninterrupted flow of energy will mainly depend on the political and economic stability of the producer regions. Even though this study has focussed on geopolitical issues from a predominantly energy perspective and that other important issues of external trade (such as the WTO discussions on the entry of new member states, trade relations with developing countries, the Doha round, etc.) and foreign and security policy (such as the impact of EU enlargement on the Mediterranean countries and the Middle East, the position of NATO, etc.) have not been directly analysed, the conclusion is nevertheless that energy will greatly determine foreign relations in the future.

3. Overall, security of energy supply is a vital interest of the member states. If security of supply is or becomes uncertain (for some or all member states) or the level of security is asymmetric among the member states, the urge to implement national energy security policy by certain member states, to guarantee these supplies, might well become stronger. However, due to the integration and liberalisation of the EU energy markets, the scope for national policies to ensure adequate levels of security of their own has decreased significantly. To the extent that member states find it necessary to forge national security of supply policies at the level of national foreign policy-making, this strategy to deal with supply concerns will not only interfere with EU energy policies but could have negative effects on the development of EU foreign and security policies. Considering the external energy dependency of the EU and given the internal market, it may be that the EU has no other alternative but to develop a coherent energy security policy that addresses the current asymmetry in exposure among the member states.

4. The EU is a project that is fundamentally embedded in the multilateral post-1945 world system. Any weakening of multilateralism will strongly impact the environment in which EU enlargement and the deepening of integration can take place. In a less multilateral oriented world system, the EU can be expected to change from an economically driven project into a political-strategic driven project. This does not mean to say that a re-orientation of the EU to a political-strategic project is in conflict with a multilateral world order. However, when such a re-orientation must take place under the mounting external pressure of a less multilateral oriented geopolitical system rather than as a result of internal choices, the EU member states might find that the time frame to realise such a re-orientation does not fit the usually long process of consultations and could therefore create new complications and unpredictable contingencies. Under the circumstances, it is altogether possible, given the current wide diver-

gence in political-strategic issues among the member states and the difficulty in the EU to address the power question that the political-strategic project may not succeed. Notably absence of a common direction in political-strategic issues could jeopardise the formulation of an EU security of energy supply policy and fuel the preference for national approaches.

5. In this study two storylines are developed with different geopolitical futures and energy security outcomes for the period until 2020. There are significant differences in the storylines; differences that warrant distinct policy approaches. However, the future will not develop strictly along these pre-dominantly energy driven storylines. The fact that other interests will also drive the EU external policies implies that the EU would benefit from keeping its (energy) policy options open. Hence, the EU should not commit itself to such a dedicated policy route that an effective future response to a different geopolitical environment is possible. This in turn should, in the short run, encourage policies that take account of this need for flexibility; e.g. look for intensified international cooperation and for the strategic interests of the EU. It appears sensible to hedge for a less multilateral centred world in the coming years. Similarly, this may well result in EU policymaking that takes into account the pursuance of national or regional vital energy interests of other prominent political and economic powers. To this end, the EU should proceed to develop a clearer understanding of its own vital interests, in the medium and long term, and what is required to serve these interests. It is sensible and prudent to assume that the market alone will not suffice and that many of the benefits associated with the exchange process could be provided by properly costed regulation. Therefore it is reasonable to anticipate a greater use of external trade and foreign and security policy-making as an important energy security of supply policy tool.

6. Due to the growing energy import dependency of other main consumer regions, such as the US, India, China and other Asian countries, energy relations will become increasingly politicised. In other consumer countries, energy security will also become a more integral part of foreign and security policy-making. Competition among consumer countries for energy supplies is likely to become more intense than in the previous two decades. The changed circumstance will necessarily have an impact on the international economic and political relations in the world.

7. In the past decades, the Trans-Atlantic relationship has been of great importance in EU-Middle East relations, and has left little room for an independent EU approach (for instance the1970s Euro-Arab Dialogue). The energy interests of the US are a primary factor why the independent approach of the EU has not received much support in the US. In recent years, the fate of the Energy Charter has been similar to earlier initiatives towards energy producing countries. The current Charter is a much-diluted measure compared to the initial plan to build and to strengthen the European-CIS energy relationship. The promotion of the long term energy interests is important and can coincide with stronger relations with neighbouring countries and/or regions. North Africa, the Persian Gulf, the Caspian Sea region and Russia are neighbouring regions of the enlarged EU and are all economies that are, some more than others, important trading partners. With the east and southward shifting borders of the EU, the external trade and foreign and security policy of the EU will certainly be influenced by enlargement; in particular by the possible enlargement with Turkey, which would create direct borders with Iran and

Iraq. There is clearly room for neighbouring countries or regions to integrate their markets with the EU. Consequently, the EU could, as a part of its (energy) policy-making strategy, facilitate a deeper integration of markets.

8. EU external trade policy and foreign and security policy will be instrumental in securing an uninterrupted supply of oil and gas by underpinning the political and economic stability in producer countries and maintaining good relations with these countries. Security of demand is of vital interest to the producer countries, which has to be acknowledged. A coherent and well coordinated EU approach in producer-consumer relations is an important precondition to achieve an acceptable level of energy supply security.

9. As a consequence of the geopolitical developments in the period to 2020, the probability of events affecting the energy security of supply and the exposure of the EU (to the vulnerability of society to the risks) is likely to increase. In addition to traditional energy policies, such as strategic reserves, foreign and security policy should also be seen as crucial element of the energy security toolset. The effectiveness of the policy tools depends not only on the ability to employ domestic energy assets, technical and operational factors, transportation and import facilities, investment climate and the availability of foreign oil and gas supplies, but also on the geopolitical setting in which these policies must perform. Given the dynamic developments in the international political and economic relations, a static approach to energy security does not suffice.

10. Energy supply security therefore requires a dynamic external trade and foreign and security policy towards North Africa, the Persian Gulf, the Caspian Sea region and Russia. Moreover, the EU policies should be focussed on political and economic sustainability in producer regions/countries to guarantee the long term security of supply of oil and gas. For this reason, stability in North Africa and the Persian Gulf must be seen in the wider context of stability in the Middle East and in Central Eurasia. Given the current level and kind of instability in these regions, the realisation of a more stable situation will take time.

11. Sustainable prosperity in the neighbouring oil and gas producing regions will also help the general security situation of the larger EU, particularly when these countries/regions can also attain better domestic political accountability and develop proper governance systems. The EU should make efforts to assist these countries in overcoming their current political and economic difficulties. Existing policy efforts towards the Magreb, Mashrak and Eurasian countries could be intensified to create mutually beneficial and good economic and political relations (see also (Com 262, Communication from the Commission to the Council and the European Parliament on the development of Energy Policy for the enlarged European Union, its neighbours and partner countries, 2003). Such relations would not only greatly benefit the southern and eastern EU member states, but the entire EU.

12. Relations with Russia should be strengthened and reflect the economic and political importance and the already existing inter-dependence between the EU and Russia. In time, Russia could become a member of the European Economic Area (EEA) or a specially created other

economic agreement that reflects the integration of the Euro-Russian markets in general and energy markets in particular.

13. The potential of Turkey to become an important country for oil and gas transit from Russia, the Caspian Sea region and the Persian Gulf adds to the strategic importance of Turkey to the EU. Turkey also connects the EU with the Middle East and is an important player in the Mediterranean. Political-strategic considerations will undoubtedly play an important role in discussions about Turkey's potential EU membership. Much will depend, in the coming years, on the political-strategic orientation of the EU itself. Nevertheless, wider market integration, including energy trade, is an important policy tool to secure energy flows.

General assumptions of the study

14. In the period to 2020, the period under investigation in this study, world demand for oil and gas is predicted to increase. The increase in demand for oil will predominantly take place in the emerging market economies and developing countries, while the growth of demand in industrialised countries will be more modest. In the industrialised countries, the demand for gas will grow substantially, mainly in the electricity generation sector. The contribution of gas to the energy balance will grow while the relative contribution of oil will decline slightly.

15. Because EU oil and gas production is maturing, EU demand for oil and gas will be increasingly satisfied by imports. A similar development takes place in other OECD countries. Demand for oil in non-OECD countries, like China and India, is rapidly increasing and outpacing domestic production, which will increase the need for imported oil.

16. The enlarged EU internal energy market will be completed in 2008.

17. Global economic growth will remain vulnerable to oil price volatility and constrained access to oil supplies.

18. Oil and gas prices are assumed to develop in significant correlation, although the correlation will be less strong than in the past as a result of market liberalisation. Development in the international oil market will continue to have a substantial impact on developments in the international gas markets.

19. In the period to 2020 there will be no physical shortage of oil and gas supplies in the world. Any shortages in the supply in oil and gas in the world that do materialise in that period will be due to political obstacles to investments and trade in oil and gas.

20. In the period to 2020, supplies of oil for the world market are predicted to originate in fewer countries than today. This is due to the fact that proven reserves in oil and gas are unevenly distributed in the world and that only a few countries/regions are surplus producers. Moreover, non-OPEC supplies are maturing which results in an increasing call on OPEC oil in the future. The Persian Gulf represents about 60 percent of world proven oil reserves.

21. Proven gas reserves are not as concentrated as oil reserves but are still fairly concentrated. Russia, including the Caspian Sea Region and the Middle East each represent about one-third of proven reserves.

22. Large consuming countries such as the US, China, Japan, India, and the member states of the EU are predicted to rely increasingly on the same oil and gas resources in Russia, the Caspian Sea region and the Persian Gulf for their supplies. With the exception of Russia, the political and economic stability of the Caspian Sea region and the Persian Gulf is distressing. In an environment of serious geopolitical competition for resources, these two unstable regions can easily become further destabilised when the external pressure to supply oil and gas markets cannot be combined with internal political and economic stability. Consuming countries should cooperate to prevent such a situation to develop. Moreover, they would act in their own interest when they help the producing countries to obtain political and economic stability.

Economic and political stability in oil producing countries

23. Many oil producing countries have experienced the negative effects of producing a singular product for the world market (Dutch disease) and the growing need for internal expenditure to create employment. The internal distribution of the oil revenues has created political disputes in various producing countries, where governance systems are weak.

24. As a consequence of the centralist political organisation of many producing countries - very frequently - manifested in the lack of independent political institutions, markets and academe the necessary checks and balances in the civil society are weak. Given the position of elites in society and the large amounts of capital involved in oil and gas production and government expenditure, producing countries are more vulnerable to corruption practices.

25. The stability of the oil market depends on the ability and willingness of OPEC to meet demand at a reasonable price and on the availability of spare capacity that can compensate for any temporary production losses or meet sudden demand increases. Because there was sufficient spare capacity available, the world has been able to cope with depressed supplies from Iran since 1979 and temporary losses of Iraqi supplies in the 1980s, 1990s and 2003. In the past ten years, spare capacity has been declining and is increasingly concentrated in Saudi Arabia. The stability of the oil market increasingly depends on the willingness of the Saudi government to create spare capacity and to make this capacity available to the market when needed to stabilise prices.

26. ‘The need of the market’ has been an important subject of discussion between producer and consumer countries. Periods of consensus about what the price and production level should be, have alternated with periods of dispute on the distribution of economic rents (when prices were either too high or too low) among producer and consumer countries. Economic vulnerability to oil price changes and security of supply on the part of consumer countries and income needs of producer countries continue to represent opposite interests in the international oil market management.

27. In the last couple of years, price volatility has become an additional issue for consumers and producers alike. Asymmetric interests in a certain level of production and price among the players in the oil value chain has undermined oil market stability. Given the distribution of reserves and the potential future production capacity in the Persian Gulf countries, the domestic economic pressures in the producer countries will become a more and more forceful driver of oil policies and could potentially undermine a cooperative oil policy among main producer countries.

28. The present uncertain political and economic climate in the Persian Gulf and the expenditure needs of the government on the non-oil sector of the economy has created a situation in which the capacity to invest in new production and transportation facilities has declined. The reluctance to allow foreign direct investments (FDI) in the oil sector could create a supply gap in the period to 2010. In the gas sector, FDI is allowed, but the economics of the projects (which includes the investment climate and the political risk) have so far limited the investments.

29. The international oil companies are reluctant to invest in new production capacity in the higher cost oil provinces in a period of low oil or very volatile prices and/or in a period of increased political risk in these regions. In combination with the investment obstacles in the Persian Gulf, the risk of underinvestment can be substantial.

30. The dramatic change in the US-Saudi relationship makes the past policy consensus appear less firm than a few years ago when Saudi security was guaranteed in return for oil market stability. After the attacks on New York and Washington of 9/11/2001, the special US-Saudi relationship has deteriorated, and has led to a withdrawal of American troops from Saudi Arabia in 2003.

31. In March 2003 the United States and the United Kingdom decided to bring about a regime change in Iraq, in the energy-rich Persian Gulf region. The intervention in Iraq has created a lot of tension among the members of the UN Security Council. The differences of opinion on how best to deal with Iraq were long standing and come from the way in which the members of the Security Council each understood the purpose and scope of the sanction regime imposed by resolutions 687, 700 and 706 in the early 1990s. These fundamental differences of opinion among the permanent members of the Security Council on how best to deal with Iraq again came to the fore when they could not agree on a 'smart sanction' regime in June 2001. With hindsight, the broad coalition of the early 1990s was not the beginning of a new international order that would be able to deal with states like Iraq.

32. The regime change in Iraq has changed the outlook of the international oil market. If Iraq is successfully stabilised and international oil companies are allowed to invest in the Iraqi oil and gas industry, the share of Iraq in world oil production is predicted to increase. Moreover, the share of oil and gas produced by private international oil companies will increase accordingly. If Iraq is not easily stabilised and the ongoing political risks prevent investments in the oil and gas industry to take place, the potential share of Iraq oil in the international market will remain unrealised and modest compared to its proven reserves.

33. A regional crisis in the Persian Gulf in one or two of the main producing countries could easily create the type of supply shortfall that cannot be compensated with supplies from elsewhere. The political and economic stability of other large suppliers, such as Nigeria and Venezuela, is worrisome and not easy to repair without substantial reforms in their economies.

EU oil and gas security of supply

34. The security of supply in oil largely depends on the stability of the Persian Gulf. The availability of spare capacity is very important for the future operation of the international oil market. In addition, but more important for importing countries, is the willingness to make spare capacity available and the predictability or transparency of this availability. Alternatively, the size, availability and the rules of employment of strategic oil reserves by consuming countries is important for producing countries. Co-operation among producers and consumer countries, e.g. through the International Energy Forum (IEF), could facilitate the reliability of oil market management. Although the strength of the fundamental differences over rent distribution should not be underestimated, the common interest to stabilise markets is also strong.

35. Accessibility of the substantial oil and gas reserves in Russia and the Persian Gulf countries for foreign direct investments of the international oil and gas companies (and the ability of the companies to bring the oil and gas to the market) can provide the EU and other consuming countries with a reasonable degree of security of supply.

36. The EU oil import dependency is increasing substantially in the period to 2020 (see Greenpaper COM 769 final, 2000). The potential level of exposure to an oil supply disruption increases when international co-operation is not optimal and political and economic instability in the main producer countries persists. The concentration of reserves and potential additional supply capacity in the Persian Gulf increases the structural dependency on these countries. Alternative supplies from Russia and Africa could offer some degree of diversification of oil supplies, but cannot compensate for a substantial disruption originating in the Persian Gulf.

37. The dependence of the EU on large volumes of imported pipeline gas from Russia and Algeria creates a high level of structural dependence. A disruption of supplies or a slowly emerging supply shortfall in these countries could jeopardise the EU security of supply, unless supplies from elsewhere could make up the gap. A growing capacity to receive gas in the form of Liquefied Natural Gas (LNG) allows for some diversification, but to quickly shift supplies from the two main suppliers to LNG is hardly feasible. The limited availability of large commercially viable LNG sources and the current cost competitiveness of pipeline gas will focus LNG supplies predominantly in the southern European gas market, where pipeline gas from Russia and Norway cannot compete. The pace of expansion of LNG capacity in the wider EU market depends on the investment conditions for re-gasification terminals, the contractual basis to support the investments along the supply chain and the investment criteria in the producing country. The lack of substantial volumes of domestically produced gas in the EU and the subsequent reliance on large volumes of imported gas, either in the form of LNG supplies or through long distance commercial pipelines, requires an investment climate that helps bring these projects on stream. Despite the projected expansion of EU gas demand in the period to

2020, the capital intensity of these investment projects require more precise information on the timing and the relevant markets and size of this expansion to realise the flows to the European market. To manage these information and timing risks, supplying companies in producing countries will seek to contract the flows in each stage along the gas value chain to realise the new capacities. The asymmetry in the drivers for gas demand and supply could create a bottleneck for the liberalised gas market that requires supportive government policy to undo. As long as demand drives supply because the risk of capacity additions in LNG and pipeline projects needs to be managed, the development of spot markets and gas-to-gas competition will be slow. From a security of supply point of view, the EU should in the short and medium term make sure that new and diversified gas supplies can arrive in the market. In the longer term, a more diversified flow of LNG and pipeline gas will help the full realisation of a liberalised gas market.

38. Half of the increase in the projected EU gas demand will be driven by demand from the electricity sector. As a result, the electricity sector will become more dependent on imported energy.

39. As already mentioned, the security of supply in gas largely depends on the stable deliveries of Russia and Algeria. Strategic gas reserves could come at very high economic costs for a number of EU countries. A slowly emerging or suddenly emerging shortfall in meeting contractual supply in either Algeria or Russia, as a result of a delay in production, transportation capacity replacements or expansion could be hard to compensate with alternative gas resources. A supply shortfall could already emerge from 2007 onward, while investments in new gas fields are slowly being brought on line. The large gas fields in Russia are maturing and new investments have to compensate the declining supply from these fields. Supplies from the Caspian Sea region are presently being purchased by Russia to fulfill existing gas contracts to Europe, rather than being offered on the European market as additional supplies.

40. The break-up of the former Soviet Union has increased the number of countries through which pipelined gas must transit. The transit of Caspian Sea region gas to Europe, either through the Russian pipeline system or through the new route through the Caucasus and Turkey is particularly complex. Pipeline capacity to bring additional Caspian Sea gas through the Russian pipeline system must be contracted with competitor Gazprom. However, the development of commercial pipelines through Russia is not yet possible. To circumvent both Russia and Iran, a commercial pipeline is being constructed from Baku in Azerbaijan to Tbilisi in Georgia and Ceyhan in Turkey. Although a solution to the difficulties of a Russian pipeline system, gas projected to travel over longer distances creates its own difficulties as the exposure to political risks, also in the transit countries, increases. Corridors in politically fragile regions where substantial pipeline capacity is constructed could create choke points.

41. Even though the Middle East has vast gas resources, there are significant obstacles that make it difficult, in the short to medium term to generate significant increase in supplies. Moreover, the investment climate in the Middle East is not much better than in Russia and the Caspian Sea Region and external capital needs to be mobilised to realise the LNG projects.

Nevertheless, projects are underway for Persian Gulf LNG exports to Asia, Europe and other markets and more plans are on the drawing board. Also in the Persian Gulf, the timing of the investments to fill up the expected supply shortfall is crucial. Yet the Persian Gulf supplies are mainly incremental supplies and unless security of supply is assured, these supplies will remain modest.

42. Pricing CO_2 emissions might run counter to diversification policy. Under such circumstances, diversification might conflict with the policy to reduce greenhouse gas emissions, unless clean technologies can be introduced. For some countries, however, diversification may appear desirable. Nuclear power may satisfy the need to diversify and at the same time reduce the import dependency and limit the emission of greenhouse gases. The current plans to dismantle nuclear capacity will begin to have a seriously impact on the EU generating capacity from 2015 onwards. At the moment, nuclear power is not generally accepted by large parts of the European public due to the problem of nuclear waste disposal. However, alternatives for nuclear power might be very hard to find in the short run without further increasing the import dependency, because the contribution of more sustainable energy will only slowly increase.

Two storylines

43. The future development of the international political and economic system has been developed along two main 'trends' or 'storylines'. We refer to these storylines as: *Markets and Institutions* and *Regions and Empires*. Under the *Markets and Institutions* storyline it is assumed that there is a continuation and intensification of the current internationalisation of markets (globalisation), and enduring co-operation in the international political and economic institutions, leading to the continued evolution of the multilateral system that governs international relations. In the *Regions and Empires* storyline, the world is broken up into more or less integrated political and economic blocks with satellite regions that compete for markets and resources with other blocks. In this storyline the Trans-Atlantic relationship was assumed to have weakened substantially.

44. Whilst initially developed as the most probable storyline, the Markets and Institutions storyline, developed over the course of this study, can be better seen as the best case storyline for the EU. This storyline requires the least policy changes to the EU security of supply policy and thereby offers governments the policy space for the completion of the internal energy market and the eastern enlargement. This does not imply, however, that the risks and exposure to a security of supply disruption or supply shortfall will not grow in the coming years. Yet in the Markets and Institutions storyline, the EU security of oil and gas supply is easier to obtain than in the *Regions and Empires* storyline, particularly because deeper economic integration with Russia is foreseen. Naturally, in the *Markets and Institutions* storyline it is possible to include a Kyoto Protocol agreement driven development.

45. To explore the worst case storyline, the *Regions and Empire* storyline was created and which is a pessimistic elaboration of the international political and economic system in which for instance the Trans-Atlantic relationship is seriously weakened and replaced by political-strategic competition for energy. In this storyline it is possible to imagine the political and econom-

ic implosion of the Persian Gulf and the subsequent drop in oil production and the unrealised gas export capacity. The *Regions and Empire* storyline tells of the consequences of the difficulties of developing sufficient oil and gas production capacity elsewhere to meet growing demand needs.

46. In the course of the study, the analysis of the geopolitics developments (in the UN Security Council over Iraq, the lack of progress in the trade talks in the WTO, the unilateral approach of foreign relations of the US, the difficult ratification process of the Kyoto agreements) was persuasive enough to conclude that the developments seem to be more in line with a *Regions and Empires* approach than to the multilateral *Markets and Institutions* path of development. This development was started prior to 9/11/2001 but became more prominent afterwards when the American approach to international relations and its homeland security dramatically changed. The conclusion that the world is more likely to develop along the *Regions and Empires* storyline could have grave implications for the EU and the EU security of supply policy.

47. In light of the analysis of developments in the Persian Gulf region (see Annex I), the inference that, under both storylines, there is a risk of the Persian Gulf slipping into turmoil, but the probability is somewhat greater in the *Regions and Empires* storyline, due to the intense competition that will break out among the main 'empires' or large consuming blocks. The level of intervention in the region will grow, unless the Persian Gulf countries manage to deter other countries to intervene. Our analysis suggests that countries in the Persian Gulf take deterrence seriously, which indicates that they also take a *Regions and Empires* storyline into account. Moreover, a firm market approach, like in the *Markets and Institutions* storyline would make substantial liberalisation of their economies and the introduction of more FDI in their energy sectors unavoidable.

48. In both storylines Russia will play, in addition to its crucial role in supplying gas to the EU, an important role in supplying the consumer countries with alternative sources of oil. The difference between the two storylines is that in a *Markets and Institutions* world, Russia will become deeper and wider integrated in the EU market, whereas in a *Regions and Empire* world Russia will develop its own 'empire'. The Russian 'empire', at least in energy terms, is conceived as very strong because it is the only oil and gas exporting block. In contrast, the other blocks will have to compete for resources. The *Regions and Empires* storyline is not unfamiliar to the Russian (and Chinese) politicians, who can thus be expected to adapt with more ease to the new situation. For the EU, which is firmly embedded into the multilateral system and the liberalisation of markets approach, more efforts would be needed to adapt to the new approach. The ability for Russia to forge strategic alliances is very large in both storylines, particularly when it re-integrates the energy production of the Caspian Sea region in its own system. The risk of Russia collapsing as a major producer is considered fairly low in both storylines. The likelihood of a development along the lines of the *Regions and Empires* storyline underscores the importance of intensified efforts on the part of the EU to integrate with the Russian (energy) market. The EU not only provides a market for Russian energy exports but can also offer finance and technology.

49. The Caspian Sea region does not play an important separate role in the storylines. In both cases, a re-integration into the Russian energy system is possible, but it is more probable in the *Regions and Empires* world. The emancipation of Russia as a re-emerging world power and the economic recovery will largely determine the policy space for the Caspian Sea region. In case of conflict in the Persian Gulf, Russia will want to secure the stability of its borders and neighbouring countries.

50. The security of supply policy of China fits in a *Regions and Empires* approach rather than *Markets and Institutions.* Still, the ability to effectively compete for oil and gas supplies is larger in the latter storyline because Chinese companies can invest in other countries to bring the oil and gas to China without fully participating in the international system. Viewed in this way, competition with Japan for oil and gas from the Persian Gulf and Russia will be fierce. Increasingly, Japan and China will want to secure the maritime supply routes and will use their naval forces in the region, for instance in the Strait of Malacca, to do so. India will also compete for resources and will also pursue naval influence in the region. Asia is unlikely to develop into a strongly coherent region because the inter-regional competition and political incompatibilities remain too large.

51. As a result of the attacks of 9/11/2001 on the United States, the latent changes in the international political and economic system in the 1990s were emphasised. The current crisis in the Persian Gulf is a by-product of the changes that ensued from the 9/11/2001 attacks. Still, the vital interests of the United States in the Persian Gulf were already jeopardised because of the stalemate with Iran and Iraq over their political and strategic position. The 9/11/2001 attacks convinced important segments of the US administration of the fact that a crisis in the relations with Saudi Arabia was imminent, which would make the Persian Gulf completely hostile to American interests. From an energy supply security point of view, the geopolitical developments have reinforced the predisposition of the current American Administration towards a unilateral foreign and energy policy. The current complicated Trans-Atlantic relationship, the increased efforts to intensify energy relations with other producing countries, such as African countries, and the breakthrough in the relation with Libya underpin this notion. The outcome of the current geopolitical conflict is still unclear but will have a great impact on the way the international political and economic system will develop. Unfortunately for the preferred multilateral approach of the EU, the current crisis in the Persian Gulf is yet another example of the world moving in a *Regions and Empires* direction. Although this trend is strong, it is not yet irreversible.

52. In a developed stage of the *Markets and Institutions* storyline, the emphasis in EU policy-making will be on maintaining good relations with producer countries. Foreign policy and trade relations contribute to a co-operative climate among countries. Markets encourage the mobilisation of capital for the expansion of production, transportation and distribution capacities. Co-operation among consuming countries in the IEA and among producers and consumers in the IEF is fortified, while co-operation in the UN will deter local or regional conflicts to become unmanageable. Import dependence is not seen as a major geopolitical or economic risk for the security of energy supplies. Projected oil and natural gas imports are expected to conform to

the IEA Reference case or, in the event of the implementation of the proposed CO_2 emission reduction policies, converge on the IEA's Alternative scenario. The market is able to assume and price most risks. Energy policy-making is focussed on maintaining good market conditions and securing public services. The emphasis in policy making is on prevention, some multilateral deterrence and crisis management. Some crisis management policies are always required to deal with operational or technical disruptions and natural calamities, in addition to disruptions as a result of temporary political conflict. At an earlier stage of the *Markets and Institutions* storyline, consumer countries will also use containment policies at the national or EU level to secure energy supplies, but these tools will become increasingly irrelevant when markets open up.

53. In the *Regions and Empires* storyline, EU energy policy will require the use of all the available energy policy tools, such as prevention, deterrence, containment and crisis management, and the active use of foreign and security policies. The strategic goal to secure vital energy supplies overrides arguments of market efficiency. Backward integration of energy companies is encouraged to create strong market players. The internal energy market of the EU will be a reflection of this strategy and oligopolistic competition would be the best outcome. Strategic bilateral alliances among consumer and producer countries and among consuming country blocks are important tools to secure supplies. Import dependency is seen as a major risk to the security of supply and domestic production is preferred over imported energies. As a result, the oil and natural gas import projections must be assumed to be much lower than in a *Markets and Institutions* storyline.

Main policy recommendations

54. The energy security policy tools available to the EU can be subdivided into tools that aim at: prevention, deterrence, containment and crisis management. In addition to traditional energy policies, such as strategic reserves, external trade and foreign and security policy are also a crucial part of the energy security toolset. Energy policy is further greatly impacted by environmental policies and vice versa. The growing interrelationship between internal energy markets, energy security of supply, foreign relations and the environment (see also Greenpaper COM 769 final, 2000) and the long-term consistency of policy-making, a more and more integral approach of energy matters is required. In order to determine the vital energy interests of the EU, internal policy co-ordination at the EU level is warranted.

55. The EU should determine its vital energy interests and correlate these interests to the relevant policy areas to allow for the development of a coherent and consistent integral approach (following the approach developed in the greenpaper). The EU should also determine the robustness of its energy systems. To this end, the EU should make an inventory of policy measures and the rigour of implementation based on coherence and consistency or the lack thereof concerning the internal energy market policies, environmental policies, energy security policies and foreign and security policies. In this inventory, infrastructure and other technical and operational aspects and the management of the systems should also be taken into account in order to clarify the weaknesses in the energy system of the EU. Another important inventory should

be made of essential demand and demand switching possibilities. Such an integral inventory can encourage the development of a coherent energy security policy.

56. The transatlantic relationship has always incorporated energy security for the EU, but has slowed down the creation of independent EU policies. Energy should be recognized as a main consideration in the EU-US relationship. Also there is some justification to consider whether the current tensions between the EU and US help the EU's energy interests. This may require asking whether the EU can act in a manner that allows it to follow through the consequences of an independent policy. If the answer is that the EU needs more time to put together the capacity to act more independent from the US, the efforts in re-building the Trans-Atlantic relationship should necessarily become larger. If the answer is that the capacity to follow through the consequences of an independent EU policy is considered large enough, more independent relationships with producer countries could become an option. A more independent approach on the part of the EU could be seen as running against the US vital interests. The American interpretation of such a EU approach will depend on the quality of the bilateral relations. In a strong Trans-Atlantic relationship a more independent EU course in energy could strengthen the American security of supply when such a course would make more oil and gas available to the international market. In the present geopolitical circumstances, the relations should be open for cooperation.

57. EU security of supply would greatly benefit from the further development of the multilateral producer-consumer cooperation in the International Energy Forum (IEF) and, at the same time, the EU should intensify the bilateral integration initiatives with Russia and other neighbouring producing, such as in North Africa, and transit countries.

58. In addition to the multilateral co-operation in the IEF and IEA, bilateral cooperation and dialogue with other important consumer countries, particularly China, Japan and India in order to ensure as much as possible a common approach concerning stability at the global oil and gas markets and global warming.

59. The EU should approach the strategic reserve policy as a strategic energy reserve policy and not approach it on a fuel by fuel basis (strategic oil and gas reserves). More efficient, more flexible and tailor-made choices for member states and their specific energy security needs and their specific dependencies are possible. The EU should develop standards for the level of security of supply and on this basis allow the member states and the industry to address the specific circumstances in a member state or a relevant market. An energy security standard and the ability to create incentives for implementation would allow the member states to show that their energy security is guaranteed by certain policy-measures, infrastructural provisions and commercial contracts without determining exactly how much oil and/or gas needs to be stored as long as the standard energy emergency requirement is achieved (which necessarily includes the IEA norm). The management of essential demand should be an integral part of such an approach. For instance, member states could opt for more dual-firing capacity and store more oil rather than gas if this provides them with a more optimal solution for their particular risk profile. Particularly in countries where gas storage is complicated and insufficient infrastruc-

ture is available to link them with other suppliers or strategic storage facilities this would create the possibility to achieve security of energy supply for the economy. This also allows for more market driven solutions in the (new) member states and it acknowledges the specific circumstances in the different parts of the EU energy market.

60. The extent of the energy security standards depend on the completion of the internal energy market and the level of integration with the energy markets of for instance Russia, Algeria or other countries. The adoption of a flexible approach could, in turn, imply that if the markets are substantially integrated, function properly and the political risks are deemed low, then the Russian or Algerian production and reserve capacity could, for example, perform the strategic reserve function of the EU. In such a situation, which conforms with the *Markets and Institutions* storyline or to a specific situation in the *Regions and Empires* storyline, an instruction to EU market players to hold a certain level of commercial flexibility contracts that can facilitate or compensate for losses elsewhere (although additional pipeline capacity is required for this purpose), could achieve energy security of supply. The level of divergence among the various member states' energy systems and the level of exposure to external security of supply risks will continue to exist in the various relevant parts of the EU market. Energy security of supply policies should be functional to present and future demands and allow the market to develop in such a way that the integral priorities of energy policies are met.

61. The impact of geopolitical changes on EU energy security is different when the internal market is complete. If the market is not complete a certain level of re-focussing of energy policy could occur. Also, the ability to integrate the Russian energy market in the EU market improves when the internal energy market is complete, although certain Russian needs to make the integration successful should be addressed. If the internal energy market is not complete, the scope of government involvement should be larger in order to encourage market integration with Russia.

62. In the event market integration with Russia cannot be achieved or when Russia poses a security of supply risk itself (low probability in the study), more domestic energy security measures will be necessary (including strategic reserves somewhere in the EU energy system) because the contractors cannot fully count on additional emergency deliveries.

63. Under the present geopolitical circumstances, the EU should keep its foreign and security and energy policy options open in order to facilitate a proper response in the event of a political calamity. Also, the transition to a more sustainable energy system should be part of the long term security of supply policy-making, particularly when the call on imported energies can be reduced as a result. Similarly, the continuation of the EU research and technological development activities in the field of nuclear electricity generation and waste disposal is necessary. In general, the field of international relations and energy, including security of energy supply, should be actively developed for policy-making purposes.

1

Introduction

1.1 Objectives

This study seeks to identify the main challenges with which the EU is confronted in search of strategies to maintain an adequate security of energy supply.[1] These challenges emerge from a set of internal and external developments of geopolitical and economic origin. The internal context is the process of dual integration, involving the enlargement of the EU and a deepening of market integration. The external context involves a changing world, in which new relationships are emerging among the main powers, the US, Russia, the EU and possibly China and Japan. These new roles are influenced to some extent by the position that local ideological and religious movements take *vis á vis* the ambitions and policies of these powers. In a period of growing dependence on imported oil and gas and - possibly - under the obligation to reduce CO_2 emissions over the coming decades, challenges may arise that require an evaluation of the present EU policies and a reconsideration of possible strategies to maintain security of energy supply.

The European Union is engaged in its most significant process of enlargement so far, with the accession of the East European member states in 2004. Before 2010, another major enlargement could be close to completion, when the remaining countries in Eastern Europe and possibly Turkey will join. Indeed, Turkey has decided unambiguously that it is closer to Europe than to the Middle East, so it will be in the EU sphere of influence anyway, either as a member or closely associated with the EU. In respect of energy, the role of Turkey is bound to grow because of the increasing volumes of oil and gas that will transit through the country, from both Persian Gulf producers, the Caspian Sea and Russia. In the next decade, 2010-2020, it is conceivable that the EU or the European Economic Space (EES) will extend to some of the states of the former Soviet Union, possibly including Russia. An enlargement with Russia, as an energy rich country would not only greatly improve the EU energy balance and achieve a further integration of the European-Russian energy market (among other markets), it would also change the geopolitical constitution of the world energy market as a whole.

At the same time, the economies of the present member states are becoming more integrated. This is a result of the implementation of the Economic and Monetary Union and the consequent need for unification and deeper integration in other economic areas. Deeper economic integration among the EU member states involves harmonization, co-ordination and unification of regulatory frameworks and policies. The completion of the internal energy markets, thus, requires a thorough revision of energy policy, including energy market regulation. Two main dimensions along which traditional energy policy will have to be re-invented stand out in this respect. The first dimension springs from the principle of subsidiarity, dealing with the level at which specific policies should be constituted; the EU, the national, or

[1] CEC, *Green Paper, Towards a European Strategy for the Security of Energy Supply*, COM 769 final, 2000.

even a lower level. The second dimension questions the appropriateness of public versus private agency to carry out (elements of) specific policies and involves the classical distinction between the role of the state and the initiative. A major issue of concern involves the question as to whether the process of structural change underway poses additional risk to security of energy supply - either as a transitional or a structural phenomenon - and what measures can be taken to reduce the consequences thereof.

In parallel with the EU, many other important energy consuming countries, like the US, Japan and China, will see their oil and gas imports grow over the next decades, as is predicted. At the same time, a concentration of the world oil and gas production in a few areas is expected to take place, based on current estimates of world oil and gas reserves. If the consumption and imports of oil products continue to grow, while the production of crude becomes more concentrated, the buyers market that existed in the period 1984-1999 won't be restored and consumer countries will face a sellers market for the foreseeable future. It is clear that the consuming countries will respond to the evolving situation, adopting policies that cannot be seen in isolation from each other. Either consumer countries may engage in aggressive competition for control over energy resources, or a certain degree of co-operation among consumer and producer countries may develop. In theory, diversification by source and origin will be important components of energy policy in many countries, while energy saving will still offer opportunities to reduce dependency.

The main energy exporting countries, however, will continue to rely heavily on the revenues from oil and gas exports. In some cases, per-capita energy income is expected to decline, due to population growth. The pressure on the governments of these countries to create economic growth and welfare for their populations will mount and could develop into a potent source of economic and political discontent. Such discontent, if not addressed, could cause real social and political turmoil and violence, fuelling regional geopolitical tensions and resulting in (temporary) disruptions of oil or gas supply. Socio-economic reform will feature high on many producer countries' political agendas in the years to come. Success will critically depend on both domestic political processes, as well as on the international political and economic space that is available to realise these reforms. Recognition of the need for change and the preparedness of the local political leadership to carry out reforms won't be enough, however. Social development will require cooperation and assistance from abroad. Seen within this perspective, there can be no disagreement about the need to underscore consumers' security of supply, by fostering social stability in the main producing countries and by securing the demand for their oil and gas. Cooperation among producers and consumers, taking care of their respective interests, is needed to minimise the risk for supply crises to arise and to serve their shared interests. Enhanced institutional co-operation between the IEA and OPEC and among individual producer and consumer countries in the International Energy Forum (IEF) should become a prime objective. By and large, the importance of multilateral cooperation is recognized, as is illustrated by the amount and character of the issues that are now on the political agendas in the several fora, however, following on from this recognition with effective initiatives is another matter.

Another challenge to the consumers' security of supply is in the fact that many of the world's poor still lack access to modern energy sources. The availability of affordable modern energies is at the root of a process of economic and political development and, thus, key to local, regional and international stability. The provision of electricity and modern fuels to these populations is a major challenge; particularly

when this increase in demand and supply of energy and the dispersion of energy to more consumers must go hand in hand with the abatement of greenhouse gases. This poses not only political and economic challenges to policy-makers and the business community but it also requires technological change to make 'clean' energy and the accompanying technologies available at affordable prices and without disruptions.

The relations between energy supply and consumption are changing as a result of shifts in the boundaries between the state and the market, through structural change and privatisation. These developments have driven a process of internationalization in the production and consumption of energy, in the activities of the industry involved and in the investments in the energy system. This process, also termed 'globalization', has redefined the energy markets, as we knew them only a few decades ago. Investment decisions of international oil and gas companies and banks encourage (potential) oil and gas producing countries to compete for Foreign Direct Investment (FDI). The resource base is but one of the many prerequisites for oil companies to compete. An attractive investment climate includes a stable economy, a developed structure for information supply and a reliable institutional framework for contract enforcement, in addition to a proper economic infrastructure. Today, the scope of markets generally transcends the scope of national governments. This asymmetry has convinced national governments in consumer and producer countries of the need for international and/or regional co-operation. Yet, the scope of the international organizations reflects the political and economic order from the past, rather than the current one.

For producer as well as consumer countries, energy is a strategic good. Producer countries rely on energy exports for a significant part of their GDP. Moreover, they are put under pressure by consuming countries, meddling with their 'internal' affairs. Consumer countries are both economically and strategically dependent on uninterrupted energy supplies. Energy security is closely related to micro- and macroeconomic variables. Imports and export of energy may have an enormous impact on the balance of payments. Subsidies, taxation, and the costs or revenues of state-owned companies may have a considerable influence on the state budget. Moreover, the costs of energy are an important factor in the rate of inflation and in the international competitive position of a country's economy[2]. In addition, military prominence depends on easily available energy supplies, in particular oil, because most equipment is driven by petroleum-based fuel. Energy is therefore not only a strategic economic good but also a political good. The fact that the supply and consumption of, for instance, oil products are part of the overall supply and consumption of energy in an economy and that, to some degree, various types of energy and fuels can be substituted for each other implies that security of supply policy has to be considered in the context of overall energy policy.

This places energy, as a vital good to nations, firmly within the realm of the geopolitical world order. Therewith, geopolitical relations – also shaped by a range of other vital interests – have a large impact on the energy relationships, while energy issues are an important component of foreign and security policy-making. This is clearly illustrated by the way in which the Cold War relationship between the US and the Soviet Union was of influence in the export of natural gas from the Soviet Union to Europe. By the

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[2] See Bohi, D.R., Toman, M.A., "Energy Security: Externalities and Policies", *Energy Policy*, Vol. 21, no. 11, 1993.

end of the 1970s and the early 1980s, this campaign met fierce resistance of the US, while the end of the Cold War also had a large impact on political and economic relations in the world. Also regional conflicts with international involvement, like the Suez crisis, the conflicts around Israel and the Palestinians, and a number of conflicts in Africa have shaped relations between oil producers and consumers. Currently, the foreign policy of the United States in the Persian Gulf and the Caspian Sea region and in Central Eurasia has a significant influence in energy relations, directly. Indirect consequences flow from the way in which the US has intervened in Afghanistan and Iraq. Also the military presence in Kyrgyzstan and Uzbekistan and the US influence in Georgia affect diplomatic relations among nations and the functioning of international organizations. Long-term challenges to the security of energy supply of the EU are and will continue to be formed by a mixture of aspects, more or less specifically associated with the energy market.

But, shortly after this study had been committed, the short-term challenges to the EU security of supply have become much more daunting. The developments in Iraq fundamentally affect the security of supply for the EU, China and the US. For the EU the timing of the intervention in Iraq is critical. With the accession of ten new member states scheduled for 2004 and discussions about adaptations to the energy policy, including the security of supply policies, still underway, uncertainty about Middle East oil supply may hinder progress in achieving the EU internal energy market, as member states may revert to national responses. The intervention by the US and the UK to bring about a regime change in Iraq caused fundamental disagreements among the permanent members of the UN Security Council (US, UK, Russia, France, and China), due to asymmetric strengths and vulnerabilities. While the rationale for US and the UK intervention in Iraq was the long-term advantage of regime change and the removal of Saddam Hussein, the other countries, in contrast, focused more on the risks of uncontrollable chaos in the region, that might threaten international oil supply. With the intervention having become a reality, it remains uncertain what will happen in Iraq in the near future. Obviously, security of oil supply would greatly benefit from a successful recovery of Iraq and its reintegration into the international community. This could also stimulate reforms in the neighbouring countries in the Gulf. Continued political unrest and economic stagnation in Iraq, conversely, would severely affect security of supply, in respect of the whole of the Persian Gulf region. It follows that the current developments in Iraq are a main determinant of the geopolitical relations and the development of the international oil and gas markets in the years to come. This dynamic geopolitical environment may trigger supply crises. To anticipate such events and to protect the main objectives of energy policy - security of supply, energy at a reasonable price, and the environment – an adequate and effective energy supply policy has to be developed. Yet, given the geopolitical context of many of security of supply issues, energy policy as such is only part of the solution. In a geopolitical context, energy policy is necessarily a part of national trade policy and the international foreign and security policy strategies.

The future of the energy relations in the world will take shape along the lines of the organisation of the future international political and economic system. In this study we will present two possible storylines along which this system can develop: *Market and Institutions* and *Regions and Empires*. The first storyline represents a continuation and intensification of the multilateral international system and globalisation of markets and the second storyline represents the break-up of the international political and economic system into competing blocks. The security of oil and natural gas supply and the accompanying policy tools will be analysed in the context of the two storylines.

1.2 Outline of the study

In Chapter 2, 'Definitions of Energy Crisis, Geopolitics and Security of Supply', definitions are given of key concepts required to interpret and assess security of supply issues in the context of geopolitical developments. These definitions serve to delimit the scope of this study and provide the guiding principles for the analyses in the succeeding chapters.

In Chapter 3, 'Energy Security of Supply and Geopolitics', our approach to international relations is introduced. Whilst both state and non-state actors play an important role in international relations, we frame our analysis at the level of the state because that is where the geopolitical developments are translated into energy security policy. From this perspective, we also show that there is a link between geopolitical events and developments in the oil and gas markets. The security of supply issues are different for the oil and gas markets, both with regard to the internal EU market and to external sources of supply. In light of our discussion, we show that Russia is by far the biggest supplier of gas to the EU, but there is a distinctly smaller level of oil exports to the EU. An important feature of the gas market is that supply lines are far more rigid, and the market lacks the liquidity and the ability of the oil market to dynamically balance the market. The structural import dependence on non-EU sources varies among the EU member states.

In Chapter 4, 'Energy Policy Tools', we extend our basic model and consider the technical, natural and economic constraints that guide the choice of the available policy instruments across jurisdictions. We show that in response to these constraints countries use different instruments, depending on the underlying institutional and economic environment as well government commitments to the private sector.

In Chapter 5, 'Two storylines and Security of Energy Supply Strategies', the storylines in which future developments of the long term energy market and world order are elaborated. We then give primary emphasis to the possible impact of these developments on the EU security of supply.

In Chapter 6, 'Two storylines and the Management of EU Security of Oil and gas Supply', the EU we interpret the main security of supply policy tools for oil and gas in relation to the two storylines. In particular, we structure our discussion to consider: tools for prevention, deterrent, containment and crisis management. We also analyse the policy options with regard to the main oil and natural gas suppliers to the EU: the Persian Gulf, Russia and Algeria.

In Chapter 7, 'Conclusion', we summarize the main policy lessons developed in this report.

In the Appendices, the material that underlies the storylines in this study is presented. This material includes producer and consumer country studies, specific topics and recent IEA projections of world oil and gas markets.

In Annex 1, the political economy of the oil and gas producing countries, such as Central Eurasia, the Caspian countries, Russia, the Persian Gulf countries, Turkey, the Maghreb, Venezuela and the West African producer states, are presented

In Annex 2, the energy economy of the United States, China, Japan and India are presented.

In Annex 3, the focus is on specific issues such as globalisation, security and the international order after 9/11, the Kyoto Protocol, Euro or USD denominated energy bills and choke points in energy transportation.

In Annex 4, we consider in some detail the recent IEA projections of world oil and gas markets based on the IEA Reference scenario 2002. Similar projections are presented for the EU. In this chapter we also examine EU energy developments, such as the completion of the internal energy market and the effects of the forthcoming EU enlargement.

In Annex 5, the Terms of Reference of this study are included.

2

Definitions of Energy Crisis, Geopolitics and Security of Supply

2.1 Overview

A number of recent studies has been undertaken to describe and to understand the potential origins and consequences of a breakdown of energy supply and to suggest possible methods to reduce the impacts.[3] In these studies, different approaches are used to conceptualize security of supply, highlighting different facets and producing different insights. Horsnell in his analysis of the probabilities of oil market disruption uses a framework that distinguishes two types of *discontinuities* and three types of *disruptions*.[4] A *policy discontinuity* arises from the consequences of changes in producer policies, in countries with spare production capacity. A *fundamental discontinuity* arises from the dynamics of supply and demand and involves the inability of the supply system to meet the level of national demand. As Horsnell argues, the first oil shock was close to a fundamental discontinuity, but it was made manifest through an export restriction disruption. He refers to three types of supply disruptions, defined as a sudden truncation of supply. First, the inability of a producing country to export because of either internal (civil unrest or war), or external conditions, are called a *force majeure disruption*, an example is the second oil shock. Secondly, *export restriction disruptions* are a deliberate restriction of exports by a producer, or group of producers, for political or strategic ends. Finally, the *embargo disruption* is a restraint placed by consuming countries on the oil exports of specific countries, like for example during the Gulf Crisis of 1990/1991.

The EU, in its Green Paper 'Towards a European strategy for a security of energy supply, refers to: first, physical risks, involving permanent or temporary disruptions; second, economic risks, referring to *erratic* price fluctuations in markets; third, social risks, involving the consequences of the former two types of disruption; and fourthly, environmental risks, as a consequence of accidents or polluting emissions.[5]

The IEA, in its study on security of electricity supply primarily refers to the "adequacy of investments in terms of providing: enough generating capacity to meet demand; an adequate portfolio of technologies to deal with variations in the availability of input fuels, and; adequate transmission and distribution

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[3] See for recent examples: Bielecky, J., "Energy Security: is the Wolf at the Door?", *Quarterly Review of Economics and Finance*, Vol. 42, 2002; Horsnell, P., *The Probability of Oil Market Disruptions: with an Emphasis on the Middle East*, Houston: Rice University/James Baker III Institute for Public Policy, 2000; Stern, J., *The Security of European Natural Gas Supplies*, London: The Royal Institute for International Affairs, 2002; IEA, *Regulatory Reform of European Gas*, Paris: IEA/OECD, 2001; IEA, *Flexibility in Natural Gas Supply and Demand*, Paris: IEA/OECD, 2002; Mitchell, J.V., *'Renewing energy security'*. London: RIIA, July 2002-09-24.

[4] Horsnell, *Op. cit.*, 2000.

[5] CEC, *Op. cit.*, 2000, pp. 64, 65.

networks to transport electricity".[6] In an earlier IEA natural gas study, it is argued that "Energy security is then simply another way of avoiding markets distortions".[7] Nevertheless, it also refers to: 1) "the longer term risk that new supplies cannot be brought on stream to meet growing demand for either economic or political reasons" and 2) "risk of disruptions to existing supplies such as political disruptions, accidents, or extreme weather conditions", or: 1) technical risk, involving accidents, terrorism or natural catastrophes; 2) the failure to mobilize long term supply or ensure deliverability; 3) political events that may involve political or union action, leading to unrest. [8] These studies illustrate that *security of energy supply* is a multi-faceted phenomenon. Disturbances of energy supply may occur in various ways, in specific contexts, in a certain time frame, in place and in space and with a great variety in consequences.

2.2 Definitions

The questions posed in the Terms of Reference[9] of this study provide a practical and theoretical basis to guide our analysis to the risks of oil and gas supply disruptions, and the policies needed to prevent such supply disruptions. Before answering the questions regarding "the relationship between energy security and worldwide geopolitical developments", as formulated in the Terms of Reference, we must first define the key elements of the analysis of security of supply issues. Main elements include: energy crisis, the relationship between energy security and geopolitics and between geopolitical risks and energy security. It follows from the central question, that the goal of this study is not the identification of potential short-term causes of an energy crisis. The study will deal, firstly, with the question of how current geopolitical developments are influencing the vulnerability of the EU to a supply disruption or abrupt price movements over the longer term and, secondly, with the evaluation of possible policies to avoid or reduce the impact of such an energy crisis. Of course, the recent developments in Iraq, despite their clear short-term character, are part of this analysis because of their obvious long-term geopolitical impact. The following definitions structure the study and determine its boundaries:

1. We speak of an *energy crisis* when demand or supplies suddenly move away from the prevailing equilibrium level, resulting in dramatic price movements with a great impact on the economy of the producer or consumer countries.
   i. We speak of an *energy crisis* when, in the short term, a disruption of supplies (as a result of domestic economic or political unrest in producer countries; export restrictions or boycott and import restrictions or embargo on energy imports) and/or a sudden price increase occur, with significant (short and/or long term) economic effects.
   ii. We speak of an *energy crisis* when supplies are suddenly greatly expanded and result in such a dramatic price decline that the continuity of the national energy systems (in consumer countries that rely on companies supplying the market but also in producer countries that cannot produce at such a low price or see their export and government income drop below sustainable levels) is at stake.
2. *A risk* to the continuity of energy supplies in consumer countries is the probability of an event affecting supply. *Exposure* is the vulnerability of a society to such a risk. Increased risk can

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[7] IEA, *The IEA Natural Gas Security Study*, Paris: IEA/OECD, 1995, p. 23.

[8] IEA, *Op. cit* 1995, pp. 17, 26.

[9] See Annex 5.

occur as a result of: a. deliberate policy changes in producing countries or producer country organizations; b. prolonged inadequate investments levels in production, transportation and processing and distribution capacity and/or maintenance; c. macro-economic instability in producer countries; d. socio-political instability in producer countries and/or regions; e. regulatory instability in consumer countries; f. market failures[10] and g. government failures[11].

3. The *international political and economic system is shaped* by national and inter- and intra-governmental and non-governmental institutions and organizations, such as states, (multinational) companies, armed forces, terrorist groups, but also peace movements, human rights activists, and environmental organizations. In this study, we consider the role of governments and therefore do not separately analyse the role and influence of these other participants on government policies.[12]
4. The *relationship between security of supply (of the EU) and geopolitics* is straightforward: in a certain socio-economic and political order or system, energy supplies are available (through the market, government or both) or can be made available in sufficient quantities and at affordable prices.
5. A *geopolitical risk to the security of supply of the EU* is when a change or breakdown in the international economic and political order or system or a part of that system takes place (exclusivity/discrimination, autarky, political boycott, failed states, terrorism) that results or could result in absolute or relative scarcity in energy (oil and gas) flows to the EU.
6. *Energy Security or security of supply* can be defined as the availability of energy at all times in various forms, in sufficient quantities, and at reasonable and/or affordable prices.[13] In this study we will focus on the availability of oil and gas in sufficient quantities, and in particular on the risks of oil and gas supply disruptions.

2.2.1 Energy crisis

There are a number of reasons why demand or supply may move away from the prevailing equilibrium level and an energy crisis (or oil or gas crisis) becomes manifest. Technical and infrastructural reasons can both cause and aggravate the impact of large fluctuations in supply, but these are not subject of this study. An energy crisis usually constitutes a sudden disruption in demand or supply that cannot immediately be accommodated by the market due to a lack of flexibility, and the subsequent price effects on the economy.

An increase in supply and a subsequent large drop in oil prices can cause another type of crisis. Such a change in supply may cause serious economic problems for the higher cost oil producing countries and for the oil companies involved. The dramatic drop in oil or gas prices as a consequence of a sudden large

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[10] Van der Linde, C., *The State and the International Oil Market, Competition and the Changing Ownership of Crude Oil Assets*, Boston/Dordrecht/London: Kluwer Academic Publishers, 2000, pp. 67-80.

[11] Shleifer, A., Vishny, R.W., *The Grabbing Hand, Government Pathologies and their Cures*¸ Cambridge (Mass.): Harvard University Press, 1998, pp. 81-89.

[12] Amineh, M.P., *Globalisation, Geopolitics and Energy security in the Central Eurasia and the Caspian region*, The Hague: Clingendael International Energy Programme, 2003, pp. 20-21.

[13] United Nations Development Programme, *World Energy Assessment,* New York: UNDP, 2000, p. 113.

drop in demand could be similar to a sudden large increase in supply. The concern of OPEC that the policy measures of consumer countries to fulfil their obligations under the Kyoto Protocol will negatively affect demand for oil are related with this phenomenon. A surge in investments in non-OPEC production and export capacity, due to sustained higher prices would have a similar effect. Not only do low oil or gas prices create economic problems for oil and gas producing countries, but they can also result in an energy supply crisis when investments in new production capacity is postponed.

(i.) Energy crisis, supply disruptions and high prices

Employing consumer country terminology, an energy crisis is usually prompted by a sudden disruption of supply and/or a sudden increase of energy prices with a significant (short and/or long term) impact on the economy. The disruption can be caused by domestic problems in producer countries or a producer region and/or by deliberate export reductions aimed at one or more consumer countries.

Disruptions of supply or even irregularities in exports by domestic problems are usually caused by economic problems or political unrest in producer countries that affect the production levels of the country. Disruptions in supply can be caused by industrial relations conflicts, such as the recent strikes in Venezuela and Nigeria that may keep the local oil industry from producing oil or gas. Such outbursts of social unrest are caused by domestic political problems. It is obvious that the dependence of these governments on the oil and gas export revenues increases the country risk and thereby unsettles foreign investors. In most oil and gas producing countries serious political difficulties arise over the distribution of oil and gas revenues. The conflicts in Nigeria, for example, are inspired by distributional conflicts among the different tribes in the country, that either or not engaged with the oil industry.

Supply disruptions also have been the result of export restrictions by a group of producer countries, targeted at one or more consuming countries. These disruptions, most likely, are part of a wider regional conflict with geopolitical implications. The oil shock of 1973/74 is an example of a crisis that was caused by export restrictions, and a boycott targeted at a number of countries, like the Netherlands, the US and Denmark. In this case, oil was used as a political weapon. The onset of the energy crisis of 1978/79 might be taken as an example of a domestic political conflict with wide geopolitical implications, which included a strike in the oil industry and hostage taking of American diplomats. The situation in Iran caused panic buying among some consumer countries that were affected by the Iranian supply discontinuity.

An energy crisis may also be caused by an embargo of a producer country or a group of producer countries. This type of disruption usually is of a geopolitical or multilateral origin and involves problems with failed, or rogue, states. The reasons for such an action include the promotion of terrorism, gross human rights abuses, breaking of international treaties (particular when it involves the build-up of military force with nuclear, chemical or biological weapons). Whilst the sanctions against Iraq in the 1990s reduced supply to the international oil market, the availability of alternative supply capacity ensured stability, without triggering an oil crisis in consumer countries.

Supply disruptions may also be caused by terrorist attacks on infrastructure, for example, on a major pipeline. The market circumstances under which the pipeline capacity is (temporarily) lost and/or the flexibility in the pipeline and transport system to switch flows is tested, will determine whether a crisis arises. Moreover, as crude oil cannot be consumed without being processed into fuels, an oil crisis can

be triggered by a sudden disruption in the processing flows. In 1990, both Iraq and Kuwait were embargoed to force Iraq to withdraw from Kuwait. Kuwait, however, was an important producer of oil products with about 5% of the world's refinery capacity and problems arose in the supply of specific light fuels[14].

(ii.) Energy crisis and low oil and gas prices

(a.) The impact of low prices on consumer countries

A dramatic drop in oil and gas prices may cause energy crises in consumer countries, because very low price levels may effectively jeopardize the interests of the energy businesses and effect investments in the energy system. The cost of oil production varies widely among producer countries and among oil deposits. It is worth pointing out here that the lowest production costs are found in the onshore production in countries around the Persian Gulf, ranging from less than $1 to $2 a barrel. In other OPEC producer countries, the production costs range from a few dollars per barrel to $7. In contrast, the production costs in the non-OPEC countries, like Russia, the Caspian Sea countries, the North Sea, the US-lower 48 states and Alaska, are substantially higher and vary between $7 and $16 per barrel. The average production costs of the international oil companies that produce mostly in non-OPEC countries average above $10-12 per barrel.

In an environment in which there is a breakdown of OPEC market-coordination and aggressive competition for market share by individual OPEC producers, we can expect prices to drop to levels below $10. The effect of such a drop in the price of oil will eventually cause more losers than winners, however. Apart from the producer countries that cannot increase production sufficiently to make up for the drop in the price and are confronted with a decline in oil income, the losers could also include the key consuming countries and the international oil companies. At very low price levels, such as the $7 per barrel IEA minimum price, many oil and gas investments will be put on hold and create supply squeezes later on. A more serious development emerges if low oil prices persist. Under these circumstances, it would not be surprising for oil companies with higher average costs of production to eventually be forced to shut their higher cost wells or for some companies, unable to meet their capital and other costs, to default on their debts. Significantly, oil markets tend to bottom out at very low price levels because production can be continued for a while, as long as variable costs can be recovered. This can result in cut-throat competition if the low oil prices continue for a longer period of time. An industry shake-out may result when the financial strength of market participants is seriously tested. Due to the formula price link between oil and gas in many markets, low oil prices can also severely impact the gas market. Low oil prices could jeopardise diversification to origin that had underpinned post-1973 OECD oil policy and could negatively affect the position of higher cost oil producers, such as Russia, but could also bring investments to a halt in other sources of energy, like gas and sustainable energy sources. Subsequently, the current environmental policies would be affected. Too low oil prices, however desirable they sometimes seem, thus may constitute a serious threat to the security of supply of the EU.

Persistent low oil prices were already in 1974 identified as conflicting with the post-1973 energy policies of diversification to source and origin and thus in conflict with the reduction of the oil import vul-

[14] Verleger, P.K. (1990) 'Understanding the 1990 Oil Crisis', *The Energy Journal, Vol. 11. No. 4, pp 15-33.*

nerability. Among the many oil crisis mechanisms, such as demand management and strategic stocks that were agreed upon in the International Energy Programme (IEP) of the IEA in November 1974, policy-makers agreed to a minimum price for oil (of $7) that IEA member states would implement if the need arose.[15] Interestingly, there is a very little published about this particular part of the IEP. In fact, it is worth remembering that the creation of this part of IEP was motivated to protect investments in 'safe' OECD oil projects, like those in the North Sea.[16] After 1974, there have only been two occasions where the oil prices dropped close to the minimum price level, viz., $8 a barrel in 1986, and $10 a barrel in 1998. It was therefore unnecessary to invoke the minimum price mechanism and, as a consequence, this particular policy tool was never tested.

From the early 1970s onwards, the policy of stimulating investments in 'safe' areas and reducing import vulnerability by diversifying away from Middle East and/or OPEC imports has been very successful. Since 1979/1980, many countries in the world became oil and/or gas producing countries as a result of investments by international and national oil companies. The share of non-OPEC oil production in world production was 47% in 1973 and reached more than 50% in 1981 and the share remained above 50% until 2003. The fact that, until recently, the international oil companies were not welcome to invest in the main oil producing OPEC countries with national state-owned companies, like Venezuela and the Persian Gulf countries, has accentuated this development. The growing volume of non-OPEC oil that found its way to the market has significantly reduced the power of OPEC to set the oil. The cost of this non-OPEC production capacity is, however, much higher than the production costs in the OPEC countries. Thus, relatively high oil prices are required to maintain such investments.

(b) The impact of low oil prices on producer countries

The detrimental effect of low oil prices on producer countries is obvious. Most oil and gas producing countries rely heavily on the hard currency incomes from oil and gas exports while also government income is very dependent on energy incomes. Despite the low production costs of oil in the OPEC member states and the possible strong competitive advantage over oil produced in higher regions, income requirements have pushed up the minimum price level at which OPEC countries can sustain their economies at the present level. As a matter of fact, the OPEC countries have lost a substantial part of their competitive edge. The drop in the oil price in 1997/1998 revealed that the threshold at which OPEC countries suffer serious economic pain was around $10-12 a barrel. In a way, this pain threshold for OPEC countries constitutes a natural minimum price for oil, because the member states will be compelled to implement production reduction policies when the price is closing in on the threshold. This response, of course, assumes that OPEC continues to function like before, that it continues to recognize a collective interest in stabilizing oil prices and that OPEC has sufficient market share to influence oil

[15] At the time, investors thought that the minimum price of $7 was far too low compared to the then current production costs in the North Sea of about $18 a barrel. Governments were in favour of a lower minimum oil price because $7 was higher than the pre-1973/1974 crisis level and thought that setting this price level would justify OPEC in its decision to increase prices.

[16] Van der Linde, J.G., Lefeber, R., "International Energy Agency Captures the Development of European Community Energy Law", *Journal of World Trade,* Vol. 22, no. 5, 1988, pp. 5-26; Lefeber, R., Van der Linde, J.G., 'Europese integratie vergt een energie(k) beleid', *Sociaal-Economische Wetgeving*, Vol. 35, June 1987.

prices with their production policy. This situation could change if the main OPEC member states can no longer agree upon proper production levels. For instance, in 1985 Saudi Arabia was no longer prepared and able to sustain the production policy of the OPEC. This policy of relatively high prices between 1980 and 1985 required ever lower Saudi oil production levels, while other member states continued to cheat on their agreement. The Saudi's then switched to a market share policy that, despite the lower prices on the international oil market, increased Saudi income from oil exports because the low price was compensated with a much larger share of production. Other producing countries suffered from this policy switch because they could not sufficiently increase production to compensate for the lower price. This policy switch of Saudi Arabia was the result of the lack of willingness, or ability, to share the burden of market stability at a set price among the OPEC member states. The lesson was that OPEC policy-making could only be successful if the interests of the large exporting countries are at least partially served and free-riding within OPEC is minor and fairly short in duration.

2.2.2 Risk to continuity of energy supplies

Apart from the domestic energy endowments of a country or region, the causes of increasing vulnerability to a supply disruption can be both political and economic in nature. To be sure, there are also important technical aspects, but these are not the subject of this study. Political risks involve: a) deliberate policy changes in producer countries or producer country organizations that impact energy supplies to consumer countries. The impact on supplies ranges from a full-fledged disruption to un-realized supplies because of political uncertainties in the producer countries. b) Domestic political instability that may prevent the industry from producing oil or gas. C. If countries are open to FDI political and macro-economic instability may prevent investment flows to materialize or reduce their size. In the 1990s, for example, political uncertainty in combination with low oil prices kept investment levels in Russia and the Caspian Sea region from reaching their anticipated levels.

The failure to supply up to levels potentially possible is also caused by the economic governance models of producer countries. These may forbid FDI or foreign ownership of oil and gas resources. Lack of domestic investment capital then causes a much lower supply level than possible under a different domestic market model. The decision not to allow foreign ownership of oil and gas resources, particularly in some of the OPEC countries, was politically driven and a response to the domination of large international oil companies and the lack of producer government control over price and production in the pre-1973 period. The problem of prolonged reduced investments is not limited to political causes also economic reasons cause under-investment. Over-investment and a subsequent period of depressed or low oil prices could cause supply problems in the longer term, as explained above. Other economic reasons involve: regulatory problems, macro-economic instability in producer countries, insufficient capital mobilisation, and market and government failures.

The economic situation in producer countries has become particularly worrisome. In the past 10-15 years, the GDP of the Persian Gulf countries has been declining due to large population growth and depressed oil and gas incomes. The oil sector and/or oil and gas ministries have been forced to compete with other spending departments in the government for investment capital. In many oil producing countries it is recognized that bringing in new capital (mostly from abroad because the domestic capital markets are too small) is necessary to make the investments that will provide the country with future incomes. But politically, this decision has been delayed because it would be a radical departure for the

economic regime that was installed after the 'victory' over international oil company domination in the 1970s. Yet, in a world where governments have more and more withdrawn from a role as producer, the oil producer countries opted earlier to introduce a government driven economic model.[17] The state oil companies have been progressively used to serve the wider economic and political goals of the government. The ability to compete with private international oil companies has been reduced as a result. The distributional fight within government of producer countries is relevant for consumer countries, because it could cause serious underinvestment and a large unrealized supply potential. Moreover, the struggle of producer countries to turn the oil and gas incomes into economic welfare for their population is also a concern for consumer countries because economic malcontent could inspire political instability.

The risks to continuity of supply are manifold. Many of these risks are risks that are extranal to the consumer countries that have little influence over domestic policy-making in producer countries. This places these risks outside the direct energy policy realm of consumer countries. Also the structure of the international oil and gas market, the international capital markets and the general economic climate in the world determine the risks to the continuity of supplies. These risks are associated with the developments of the international economic system and fall within the realm of international monetary and trade policies. The problems related to failed states or politically instable regions are also outside the realm of energy policy, but they are part of consumer countries' foreign and security policies. We explore these issues fully in the storylines below.

2.2.3 Security of supply and geopolitics

Changes in the political and economic system can have a profound impact on the availability of oil and gas flows. The oil and gas potential of Russia and the Caspian Sea region were for a long time not fully accessible for the non-state planned part of the world. In that respect, the fall of the Berlin Wall in 1989 and the transition of the East European countries and the countries of the former Soviet Union was a dramatic change of the international and economic order. It made more energy resources available to the international system of market economies. The opening of China is another large change to the international system, which is expanding the reach of the international market system. Yet, we must recognize that currently not all countries are participating fully in this system and that countries that are participating can always step out. Also, there are many countries with only a partial integration in the world economy, in Africa, Latin American and Asia. With the growing importance of African, Russian and Caspian oil and Latin American gas, it would be harmful to the security of supply if these countries or regions would refuse, for political or economic reasons, to participate to the world economy, or to be forced to stay out. In the main, foreign policy and sometimes security policy should be geared towards the prevention of full disintegration of countries or regions that produce oil or gas for exports.

2.2.4 The international and political system

In international relations or geopolitics, the system is not only shaped by states, but also by non-state actors. The level of analysis in this study is predominantly focussed on the state level. The main question is 'how security of energy supply relates to geopolitical developments'. The related question, as to what energy policy measures could be taken by states, justifies this focus. It is however clear that part of

[17] Van der Linde, *Op. cit.*, 2000, pp. 27-48.

a state's energy security is realised through the market and that market developments have an impact on security of supply. The shift, for instance, from oil to gas consumption carries new challenges to security of supply. Daniel Yergin compared this shift to "[…] the situation in the early 1970s when the US went from importing a little oil to a lot of oil, forever changing the course of its foreign policy."[18] A similar development of the relations between gas-importing and gas-exporting countries is likely and can easily become just as politically charged. US gas imports from more far-away countries in Africa or the Middle East, in a gas market that will internationalise along similar lines as the international oil market, will introduce geopolitical concerns to the US gas market. For gas importing countries in Europe and Asia this was already the case, but in a more competitive market for gas imports, the geopolitical concerns will be brought more and more to the fore. Furthermore, the events in the post-9/11/2001 period have increased the uncertainties about the geopolitical and economic developments in both company headquarters and consumer country capitals. Philip Watts, Royal Dutch/Shell's chairman recently said: "We must be prepared for growing geopolitical turbulence and economic volatility."[19] Against the background of increasing imports of oil and gas in the major consumer countries and the inevitable politicization of energy relations that accompanies this structural dependence, oil and gas have become both drivers of geopolitical developments, as well as a prey thereto.

2.2.5 Geopolitical risk to security of supply

A geopolitical risk to the security of supply can occur when the international political and economic system is strained or in turmoil as a result of power politics and competition among leading states, or when a local or regional conflict leads to a collapse in the rule of law in parts of the international system (see also Section 2.1.3). The Middle East conflict, the war between Iraq and Iran, Iraq in the 1990s and the 1978 Iranian revolution are a few examples of situations where geopolitical phenomena jeopardized supply security. Terrorism has been a feature of the international system for many years. We speak of terrorism when groups or organizations that oppose regimes in certain countries or regions try to destabilize the regime of one country and/or try involve the important players in the international system in the conflicts with attacks on people or important infrastructure in these countries. The present terrorist threats with regard to energy security are predominantly Islamic groups in various countries that oppose the regimes in the Middle East and/or Caspian Sea region or oppose the 'western way of life' that is promoted, in their eyes, by the present international political and economic system. To a much lesser extent, terrorism constitutes a risk to security of supply as a consequence of possible attacks on key energy infrastructure and 'essential' facilities to the system.

2.2.6 Energy security

In a situation of a sudden disruption and/or price increase it is clear that the security of energy supply is in jeopardy, depending on the duration of the situation. However, many situations that could lead to a serious disruption or sudden price increase start with an incident. In itself such an incident does no constitute an energy crisis, but it is a trigger. Usually it is the *context, size and the accumulation of incidents* that turn a situation into a full-blown crisis. Past disruptions have surprised analysts and policy-makers

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[18] Hoyos, C., "Energy Companies see a big Future of Gas. But will the West's increasing dependence imperil its fuel security?", Financial Times, 15 August 2003, p. 9.

[19] Ibid.

when seemingly small production fluctuations caused large price fluctuations, while major production problems had hardly any impact at all, or could easily be compensated from other sources. Some crises originated not in one event, but in many, sometimes fully unrelated incidents.

Energy security cannot be easily translated into absolute numbers. The question: "At which level of supply disruption -500.000 thousand barrels per day or 2 million barrels a day or at which price level, $30, $35 or $50- is the security of supply seriously in danger?" is useless, as the answer depends entirely on the political and economic circumstances. The assumption that security of supply is less an issue with an import dependency of 30 or 40 percent of domestic demand than with 50 percent or 60 percent can be false, when the ability to switch fuels is almost absent in the first situation and when one particular sector, for example transport or electricity generation, is entirely dependent on certain supplies. The level of risk to a country is a function of the flexibility of its energy system and its economy to accommodate supply shocks and the tightness of the energy market concerned. In the early 1980s, oil supply from Iran and Iraq remained far below the anticipated level, partly as a result of the war between the two countries. Yet, no real crisis developed, as the OECD countries were experiencing an economic recession with the ensuing fall in demand for oil, while there was ample spare production capacity. In more favourable economic circumstances, a war between two major producing countries could have caused a major energy crisis. Yet, prices actually were under strong pressure already and declined dramatically in 1985/1986.

Generally, an industrial conflict in one of the (major) producing countries will be fairly innocent, as long as it does not affect the entire export production. When sufficient spare production capacity is available in the system, the effects can easily be compensated for by increasing the production elsewhere. However, when the industrial conflict is part and parcel of deeper political problems in the country, in a tight oil market situation, like in Iran in 1978 and Venezuela in 2002/2003, an industrial conflict can be a serious threat to the security of supply of some or all of the consumer countries.

These examples show that it depends on the market fundamentals and the geopolitical circumstances whether a situation to be absorbed, or whether it develops into a full-blown crisis. It is easier to identify factors of risk to the security of supply, than to translate these risks into reliable predictions of the effects. A complex set of factors, particularly when we include geopolitical developments in the equation, makes it quite difficult to develop a chance distribution of events and their development into a crisis. Possibly, at the extremes, where the effects seem easier to predict, the impact can be translated into price and flows. Yet, in the grey area between these extremes, such exercises are impossible.

3

Energy Security of Supply and Geopolitics

3.1 International relations and security of energy supply

In the recent past, both consumer and producer governments have been concerned with security of supply and demand. The policies to fulfil these strategic interests differed significantly for both sides, because producer countries relied predominantly on government intervention, while consumer countries relied mainly on a market-based approach with certain government incentives. Post-1973, OPEC was the main proponent in defending the producer countries' interests, while OECD countries relied on the investments of the international oil companies to supply the market with sufficient non-OPEC oil. The rapid opening of Caspian Sea oil exploration and production for FDI, after the demise of the Soviet-Union, and the struggle for influence over the pipeline routes already promised a much tougher future competition among producer and consumer countries, to bring new developments within their type of 'oil and gas-order'. In the near future, the flows of gas have will become equally important, against the backdrop of increasing import dependence on politically uncertain regions. The expected concentration of oil and gas exports to only a few countries in the medium term, that are geographically close and share many of the political and economic instabilities, have alarmed policy-makers in consumer countries.

Energy and the political agenda

The energy security is a vital interest of the major players on the international political scene and has been identified as such by US national security planners since the 1970s.[20] In the past few years, oil has made a spectacular return on the international political agenda. Major consumer countries are deeply concerned again about their future security of supply. After a period of about 15 years in which oil consumer countries successfully managed to capture a large share of the economic rents[21], they now are concerned that the balance will tip again in favour of the oil producer countries.[22] The OPEC production cuts of March 1999 and the strong compliance of the OPEC members was a confirmation that OPEC market power was back again.[23] Consumer countries are increasingly competing for political influence in order to secure future supplies. The competition among the US, the European Union and large Asian consumer countries like China, that has become obvious in the last couple of years, will have a substantial impact

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[20] Armitage, R., "The New Geopolitics, introduction", in: Bloomfield, L.P. (ed), *Global Markets and National Interests, the new geopolitics of energy, capital, and information*, Significant Issues Series, Vol. 24, no. 3, Washington D.C.: Center for Strategic and International Studies (CSIS), 2002, pp. 4-7.

[21] Economic rent is: "any payment made to a production factor above the amount necessary to keep that factor of production in its present employment." Baumol, W.J., Blinder, A.S., *Economics, Principles and Policy*, 1991, p. 753. The importance of economic rent arises from the fact that it can be taxed away without reducing the quantity of output supplied. The various players in the market, including governments, are rent-seekers.

[22] Favennec, J.-P., "Géopolitique du pétrole au début du XXI^{e} siècle", *Commentaire*, Vol. 99, 2002.

on the wider political and economic relations among consumers, producers and between producers and consumers. The controversy over Iraq in the UN Security Council in the run up to the armed intervention by the US-British coalition epitomises this battle over how best to secure Middle East energy flows in the future.

The EU green paper on security of supply expressed concerns about the future oil and gas supplies from an increasingly concentrated group of producer countries. At the moment, 65% of the world proven oil reserves are located in the Persian Gulf region and the structural import dependency of gas is also substantial. Also the European Union expressed the need to increase the supply of non-OPEC oil and to diversify to origin, but they also recognised that their strategic import dependence would remain and required an improvement of the economic relations with key producer countries.[24]

In recent years the concerns about security of supply were laid down in various policy documents in main consumer countries. In these documents the different approaches, i.e. the market or strategic-government approach or mixtures, come to the fore.[25] In the mid-1990s, China adapted its energy policy to its stepped-up need for imported energy.[26] In this strategy intensifying the use of domestic resources and securing more oil from the Middle East and the Caspian Sea region by way of FDI of Chinese oil companies was brought together. The Chinese companies were supposed to bring this oil to the Chinese market.

In January 2001, the Bush Administration was inaugurated amidst mounting problems in the US energy supply system. The new administration immediately set out to prepare a new Energy Policy document. This policy was articulated in a document published in May 2001 and the increasing import dependency featured highly on the American energy agenda. The main objective of the policy was to encourage domestic production of energy (oil, gas, coal and nuclear). In this policy document it was also recognised that the troubled relations with Iraq and Iran would have to be resolved in the future in order to release enough oil for the international market. Foreign policy towards these two countries effectively barred American oil companies from investment opportunities, positioning companies from other consumer countries better to gain entry. Another important element of energy security was ignored, however, namely the creation of a stable and predictable regulatory environment that could underpin a sound investment climate. This became clear when the blackout in August 2003 in the Northeast electricity market, stretching from Ohio, Quebec to New Jersey, illustrated the importance of such coherent regulatory and investment climate for a robust energy infrastructure.

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[23] March 1999 OPEC decided to cut production with 5.4%. In the space of a few months, oil prices increased from very low levels at $10-12 per barrel to more than $30 and prices remained high until late in 2000. Compliance was high, around 80%. See *OPEC Press Release, no. 2/1999*, 23 March 1999, BP Amoco *Statistical Review of World Energy* 1999, 2002.

[24] CEC, *Op. cit*. , 2000.

[25] Andrews-Speed, Ph., Liao, X., Dannreuther, R., The *Strategic Implications of China's Energy Needs*, Adelphi Paper 346, Oxford: The International Institute for Strategic Studies, Oxford University Press, 2002, pp. 13-20.

[26] Ibid., pp. 24-44.

3.2 The oil market after 9/11/2001

The 9/11/2001 attacks on New York and Washington brought about a dramatic transformation in the US security policy. Amidst an acute awareness of a myriad of vital interests, the growing import dependency definitely played a role when the first contours of the war on terrorism were sketched out. The US's troubled relationships with some countries in the Middle East compelled a much-needed policy re-assessment. In addition to their already tense political relations with two large Persian Gulf producers, Iran and Iraq, it were particularly the doubts about their continued strategic reliance on Saudi Arabia that forced high ranking policymakers to re-evaluate their energy security in the new international political context. In fact, the 9/11/2001 attack was as much an attack on the US as an attack on Saudi Arabia's regime and its relationship with the US. Al-Qa'eda's choice to instruct a group of predominantly Saudi nationals to execute the attack was a strategic decision to upset the cosy and long-standing US-Saudi relation. To the Americans, it made clear that the future relations with Saudi Arabia were much more vulnerable than anticipated. US energy security had relied on the special relationship with Saudi Arabia because "(…) Saudi Arabia is the key to world oil stability, the accommodating supplier when markets get too tight."[27] For the US, the assumption that it could rely on Saudi Arabia to manage the oil market conditions, largely in compliance with its interests, appeared to have become 'outdated' and required a re-evaluation. The war on terrorism was announced as a long battle that would take place at many levels and with different methods. Energy security became integral part of that battle because many of the trouble spots involved producer countries in the Persian/Arabian Gulf region and the wider Caspian Sea region, also known as Central Eurasia. The Recent attacks of Al-Qa'eda on targets in the Middle East illustrate its objective to undermine the political stability in the region.

The US, Europe, Russia and China were already involved in what is popularly termed 'the new great game' in the Caspian Sea region where, after the demise of the Soviet Union, oil and gas exploration and production was opened for FDI, and a strategic fight over export pipeline routes began in earnest in the late 1990s. The Caspian Sea region was seen by the large consumer countries as a good opportunity to replace mature OECD-oil production and manage their future dependence on Persian/Arabian Gulf oil. Moreover, the Caspian Sea region held a huge gas export potential that could balance the European dependence on Russian gas imports and that could control the development of the large stranded gas reserves in the Gulf region. The enthusiasm with which the Caspian Sea resources were embraced disguised the fact that these resources have to partly replace the mature resources in the North Sea and Alaska. In term of reliability, the Caspian resources are no really a replacement because political uncertainties are rampant. Fusaro commented: "Political uncertainty in the Caucasus region- both within these fragile post-Soviet political systems and between these newly independent countries and their ambitious neighbours, Russia and Iran- obviously remains a potential barrier to development of these resources. In considering the future importance of the Caspian Basin to the world of 2010, one could also remember that production in the former Soviet Union was 11.4 million barrels per day in 1990- an aggregate level that Russia and its Caspian neighbours may not attain for the next 20 years."[28]

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[27] Sachs, J., "The real Target of the War in Iraq was Saudi Arabia", Financial Times, August 13, 2003, p. 11.

[28] Fusaro, P.C., "The Future Importance of Oil, Geopolitical Lynchpin or Common Commodity?", in: Bloomfield, L.P. (ed.), *Global Markets and National Interests, the new geopolitics of energy, capital, and information*, Significant Issues Series, Vol. 24, no. 3, Washington D.C.: Center for Strategic and International Studies (CSIS), 2002, p. 47.

In the decade from 2010 to 2020, the world will not physically run out of oil. If scarcity emerges, it will be a consequence of political events. The threat of an oil supply interruption has not been reduced structurally since the first oil crisis in 1973/1974[29], as oil supplies from the unstable Persian Gulf region will become steadily more important for the world oil market. In addition to regional conflicts that might disrupt supplies, we should as well contemplate the effect of a change of regime in a major oil or gas producing country. In case of the change of regime in the former Soviet Union, supplies to the world oil and gas market were not affected, but domestic supplies were greatly reduced and particularly oil production declined dramatically. This would appear to confirm the view that producing countries rely so heavily on oil and gas export revenues that any new regime will be inclined to continue supplying the world market. This view not always applies. In the case of Iran for example, the change of regime in 1978/79 did have a large impact on production and exports. In 1979, Iran produced close to 6 million barrels per day, while the production capacity in 2003 is still short of 4 million barrels per day.[30] Although the international oil market has since 1973 become more diversified, oil has become a commodity for which risks can be off loaded at future exchanges, and strategic stock releases by IEA member countries can mitigate the effects of most disruptions. According to Franssen, however, regional conflicts and a regime change in a major producing country could still jeopardize security of supply.[31]

The security of gas supply is a different matter, although the expansion of gas consumption and trade will increase the geopolitical risk dimension to gas flows as well. The current rigidity of gas flows can be both an advantage and a disadvantage for security of supplies. On the one hand, supplies cannot be easily redirected to other preferred consumers because pipelines create a captive market for producers and consumers alike, and on the other hand, regional or domestic conflicts immediately jeopardize that market without much alternative supplies available. Particularly, the consuming countries in the EU - and possibly at a later stage – in Asia that expect to increase their gas imports from Russia, the Caspian Sea region and the Middle East, will be confronted with geopolitical risks to their gas supplies. The international gas market is far from mature and the commoditization of gas, even on a regional scale, lies in the future. LNG could provide greater diversity and flexibility of supply that is desired for security reasons and may, thus, bring about a change in the structure of the gas market. However, the economics of LNG make new developments still fairly expensive and risky, particularly when price volatility persists.[32] The outlook for LNG is, nevertheless, deemed bright because of the looming supply deficit in the US while at the same time major cost efficiencies have been realized along each stage of processing. For instance, in the period 1996-2000 the average liquefaction costs were $230 per ton compared to $560 per ton only 10 years before and the average costs of LNG tankers reduced from $220 to $155 million in the four years between 1996 and 2000.[33] The expansion of the LNG industry will unlock more gas for the international market and will provide more diversity to origin in the gas flows but much of this gas will originate in less politically stable countries.

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[29] Franssen, H.T., "Oil supply security through 2010", in: Bloomfield, L.P. (ed.), *Global Markets and National Interests, the new geopolitics of energy, capital, and information*, Significant Issues Series, Vol. 24, no. 3, Washington D.C.: Center for Strategic and International Studies (CSIS), 2002, p. 64.

[30] Ibid., p. 61.

[31] Ibid., p. 65.

[32] Hoyos, C., "Energy companies see a big future for gas. But will the West's increasing dependence imperil its fuel security?", Financial Times, 15 August 2003, p. 9.

The strategic manoeuvring of the major players in the international oil and gas markets of the past few years is reaching a climax so far in the crisis over Iraq. The main consumer countries find themselves at odds concerning how best to deal with Iraq after the United States made it clear that containment, in the new reality after 9/11/2001, no longer sufficed. The other large consumer countries are particularly concerned that the American strategy to forcefully remove Saddam Hussein will backfire, and create political havoc in the most important oil exporting region in the world. That would seriously hamper their security of supply. Another concern is that they will be locked out of the development of Iraq's oil reserves for lack of support for the American and British position.

The serious international political crisis over Iraq and the open competition among consumer countries for a position in which they can support their oil companies to participate in the future development of the oil industry in Iraq bears similarities with the sharing out of the Ottoman Empire after the First World War. Yet, if history has any lessons, then the realisation of the full oil potential of Iraq, that so many believe is up for grabs now, will again not materialise because other, more strategically important producer countries, need to be accommodated first. In the past, both Iranian and Saudi oil was given preference because the rulers of the countries needed the oil income and the US needed their support in containing the influence of the Soviet Union in the Middle East. It is perhaps the tragedy of Iraq that whether it was caught up in international or regional politics or was caught up in domestic political infighting, its richness in resources never translated in a position that produced such integration in the world economy that welfare and stability became Iraq's part. The US-British intervention in Iraq attempts to introduce a radical change to the political and economic structure of Iraq. Yet we must also be aware that this intervention is part and parcel of a greater design to change politics in the Middle East, in which the change in Iraq is a mere part.

3.3 The state and the market

The international oil (and gas) market is not easily analysed from a mere economic perspective and it is clear that national or international political and strategic issues play a very important role. Furthermore, the international oil market is strongly influenced by 'rent-seeking' behaviour[34] of states. The fact that the move towards long-term security of supply is accomplished by both a market and a strategic approach or a mixture thereof, requires us to examine the dynamic relationship between the market and the state.[35] The consumer government energy policies are concerned with securing energy flows, or demand in case of a producer country, for their economy, at a reasonable price. Moreover, as energy prices fail to reflect the environmental and social costs of energy use and production, consumer governments began to include the environment as a separate goal in energy policy, in the 1980s. In theory, these three goals should be equally important to pursue. In practise, a balanced pursuit of these goals has proven impossible, because they generally embody fundamental contradictions. Depending on the market structure and energy balance of a country, the energy policy goals are prioritised and one or two of the goals,

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[33] Ibid.

[34] See above and also see Klitgaard, R., *Controlling Corruption*, Berkeley/Los Angeles: University of California Press, 1988, pp. 41-47; Shleifer, A., Treisman, D., *Without a Map, Political Tactics and Economic Reform in Russia*, Cambridge Mass.: The MIT Press, 2000, pp. 3, 9.

[35] Strange, S., *States and Markets*, London: Pinter, 1988, p. 22; Van der Linde, *Op. cit.*, 1991, p. 1.

which are pursued with greater vigour than the other(s). In the past, national energy market models have varied widely, ranging from models in which government intervention was prevalent, to in which private enterprises were dominant, and mixes of these. There is a strong relationship between the players in a market, the pursuit of economic rents by these companies and governments and government policy-goals. International oil companies have adapted their activities and strategies to these different models and often have been active participants or engineers of these model changes.

In the post-WWII period, the role of the state in the economy was relatively more dominating than in previous periods. This was due to the idea that government could manage the business cycle. The economic problems in the 1970s that were partly due to the oil price increases, like large balance of payments deficits, increasing inflation, and stagnation of economic growth, were initially countered with more government intervention. In that period, fiscal deficits quickly increased.

Due to the failure of the tested recipes of economic policy-making, this policy was abandoned after the second round of oil price increases in 1979/80. In the early 1980s, the neo-liberal approach of the market gained support when the costs of managing the business cycle became too high. Liberalisation and privatisation of the domestic economy, partly due to international and regional pressures, implied the withdrawal of the state as a producer and instead was replaced by a de-regulating and re-regulating state. The European internal market, the liberalisation of capital markets and the further liberalisation of international trade were both an expression and a stimulus of this transformation, depending on a particular state role as a first mover or a follower.

International economic institutions like the IMF, World Bank and GATT/WTO became important instruments to realise international markets. These markets reflected more and more the 'principles, norms, rules and decision-making' of the OECD countries because they employed their structural power in international economic affairs. In the period after 1973, and particularly after 1979/80, a rapid process of liberalisation of markets is embarked upon.

In this period of general liberalisation, a different process took place in the international oil industry. The international oil market developed from an oligopolistic market structure, in which large international oil companies dominated parts of the entire value chain of oil, to a market that was dominated by (OPEC) government intervention in crude oil reserves and production. The assets of the large international oil companies in the most important OPEC countries, Saudi Arabia, Kuwait, Iraq, Iran, and Venezuela were nationalised in the course of the 1970s. This resulted in a substantial switch of oil assets from international private to public ownership. This not only paved the way for more control of OPEC countries over oil production, but it also, as it appeared later, introduced much inefficiency in the industry and corruption. Adelman is very blunt in his opinion on how the state oil companies function: "Socialism died in the 1980s as a fighting faith and is scorned as a bad idea whose day has gone. Yet most of world's oil is still produced by flabby national dinosaurs, OPEC and non-OPEC.[36] The problem is much older. Ibn Khaldun stated it 600 years ago: "Commercial activity by a ruler is harmful to his subjects and ruinous to the tax revenue."[37] Even state corporations that are not corrupt and wasteful cannot follow a rational

[36] Adelman, M.A., *The Genie out of the Bottle,* Cambridge, Mass.: The MIT Press, 1995.

investment plan. The money they handle is not their own. Their revenues are bespoke for "national needs-that is special interests."[38]

The power of OPEC in the 1970s was large, because the OECD countries were very dependent on oil imports from only a few exporting countries; the supply pattern was relatively rigid and there was no spot-market.[39] The import dependency and the accompanying vulnerability were not so much a consequence of OPEC policy, but a result of the international oil market structure of that time. The shift in ownership of crude oil and the import dependency led to sharp political controversies in the 1970s and created a long-lasting distrust of OPEC's intentions. This, plus the high oil prices stimulated the development of Non-OPEC oil production.

Despite the relatively low oil prices of the past 15 years and the fact that OPEC's share of the world market was modest, compared to their share in oil reserves, the major consumer countries began to worry about the future structure of supply, when Non-OPEC supplies will begin to decline. Strategies to balance the foreseen increase in dependence on Middle East oil, already led to fierce competition for control over Caspian Sea resources and the pipelines routes that would bring out the oil among these consumer countries.[40] The conflict over Iraq underlines the strategic importance of access to relatively low cost oil and gas reserves.

The present controversy over Iraq, however, is not only a product of future concerns about security of supply, but also a product of past international strategic and political manoeuvring. The period in which OPEC dominated international oil markets did not bring the much needed political reforms in the countries in the Middle East, nor the economic independence of oil income that would have created macroeconomic stability. Short-term domestic problems run the oil agenda of many producer countries. Recent attempts to keep political issues away from OPEC production decision-making have not convinced consumer countries that the countries can head off the volatile domestic and regional political situation without using oil to manipulate the agenda. Consumer countries are aware, however, that producers with spare capacity such as Saudi Arabia could come under political pressure not to accommodate the consumer countries' need for a less tight market.

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[37] As quoted in: Rabi., M.M., *The Political Theory of Ibn Khaldun*, Leiden: E.J. Brill, 1967, p. 232.

[38] Leite, C., Weidman, J., *Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth*, IMF Working Paper, WP/99/85; Machmud, T.N., *The Indonesian Production Sharing Contract, An Investor's Perspective*, The Hague: Kluwer Law International, 2000, pp. 163-171; Rose-Ackerman, S., *Corruption and Government, causes, Consequences and Reform*, Cambridge: Cambridge University Press, 1999; Anechiarico, F., Jacobs, J.B., *The Pursuit of Absolute Integrity, How corruption control makes government ineffective*, Chicago/London: The University of Chicago Press, 1996, pp. 173-188; Johnston, M., "Public Officials, Private Interests and Sustainable Democracy: When Politics and Corruption Meet", in: Elliott, K.A., *Corruption and the Global Economy*, Berkeley: Institute for International Economics, 1997, pp. 61-107.

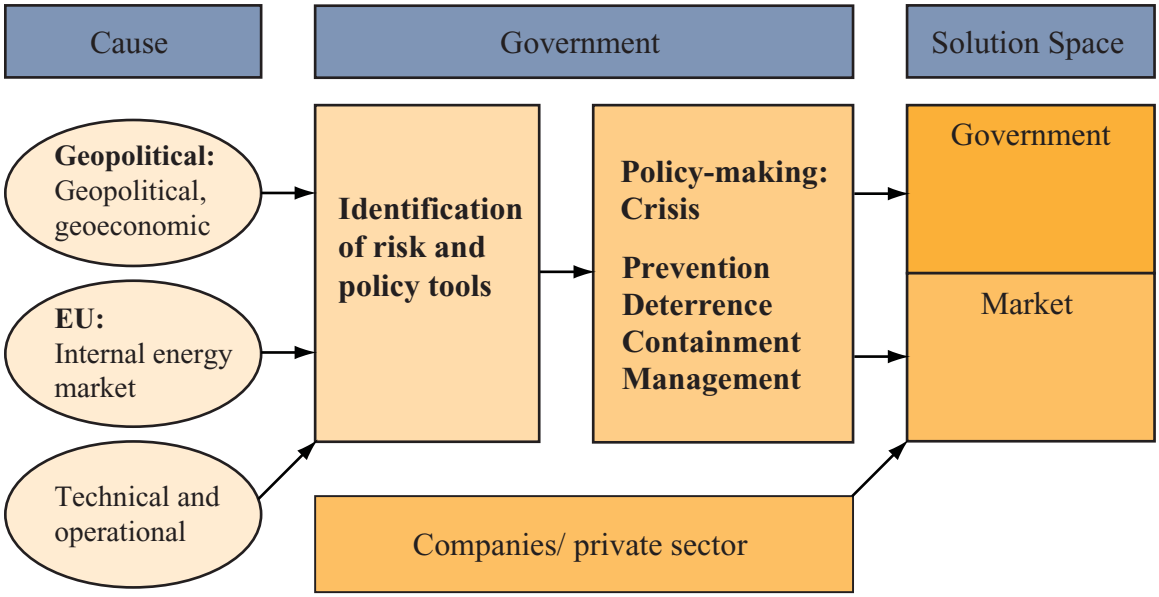
[39] Molle, W., *The Economics of European Integration*, Aldershot: Dartmouth, 1990, pp. 307-308; Van der Linde, *op. cit.*, 1991, pp. 99-115.

[40] Amineh, M.P., *Globalisation, Geopolitics and Energy Security in the central Eurasia and the Caspian Basin*, The Hague: Clingendael International Energy Programme (CIEP), 2003, pp. 3-5.

3.4 Geopolitical events and EU energy security

It is clear that geopolitical events have greatly influenced the developments in the oil and gas sector and policy-making (see figure 3.1). Many of the policy instruments that are applied today were developed in the aftermath of the oil crisis of 1973/1974. The remedies that different EU governments adopted to reduce the security of supply vulnerabilities vary widely, depending, among other things, on the domestic energy endowments, structure of the domestic energy market and the ability to diversify away from oil into gas or other fuels. Particularly in electricity generation, oil was massively substituted by coal and nuclear and later also gas. The ability to substitute oil for other fuels was much more limited (in the transportation sector). The shift in the demand for oil towards the lighter end of the barrel influenced the refinery slate in the EU oil processing industry. In the present energy mix and the dependence on imported oil and gas, we recognise the policy responses to the geopolitical changes and the oil crises in the 1970s and the subsequent changes to the international oil industry structure in the 1980s and 1990s.

Figure 3.1 Schematic presentation of the structure of energy policy-making



Given the Green Paper's[41] prediction of increasing EU oil and gas import vulnerabilities, the question posed here is to what extent future geopolitical developments will affect EU energy security of supply and which policy responses could remedy the possible vulnerability. The dependence on oil and gas in the period to 2020 will be substantial because possible alternative (sustainable) energy resources, despite their growth, will not be available to satisfy the growing energy demand. The Green Paper furthermore predicted fossil fuels will still contribute about 50% to the energy demand in 2050, even when efforts to

[41] CEC, *Green Paper. Towards a European Strategy for the Security of Energy Supply*, COM 769 final, 2000.

introduce alternative energy resources is stepped up. The distribution of proven oil and gas reserves in the world and the economics of oil and gas exploitation indicate that future EU oil and gas supplies will increasingly become more geographically concentrated on Russia, the Caspian Sea region and the Persian Gulf. Security of oil and gas supplies is therefore an important issue in the next decades.

3.4.1 Oil

Oil was a major driver in the substantial growth of international trade in the past few decades. Oil was the preferred fuel because it was amply available, easy to transport, and widely applied in the new industrial process technologies and products. Subsequently, light industrial sectors and process technology were able to increase the efficiency of production processes, and ended the requirement for corporations to position themselves on locations near fuel supply centres, transport corridors, or coastal industrial sites, which is still more or less the case with gas and coal industries. This new economic flexibility that resulted from the use of oil as the predominant energy source, in combination with the improved communication methods and the international capital flows enabled the internationalization of production. The new flexibility enabled companies to reduce the costs of production with the relocation of their production to those sites where labour, energy, capital or knowledge costs were the lowest.[42] Oil was at the heart of the post-1945 economic expansion in the world.

Oil reserves

The world is not predicted to run out of oil in the next few decades, and if we factor in the huge reserves of unconventional oil, the world can enjoy consuming oil for much longer[43]. The problem in the next few decades is therefore not resources but resource mobilisation. In the last few years proven oil reserves, with a 90% probability at current prices and technology, have remained fairly stable. Current estimates put proven oil reserves at more than 1000 billion barrels.

Table 3.1 World crude oil reserves (billion barrels)

Continent/ region	Oil & Gas Journal Jan 1, 2003	World Oil Year-end 2001	BP Year-end 2002
North America	215.089	49.979	49.900
Central & South America	98.551	69.081	98.600
Western Europe	18.267	17.749	15.600
Eastern Europe and Former SU	79.190	67.126	80.500
Middle East	685.642	662.483	685.000
Africa 77.429		94.855	77.400
Asia & Oceania	38.712	56.491	38.700
World Total	**1,212.881**	**1,017.763**	**1,047.700**

Source: BP, *Statistical Review of World Energy*, June 2003, data for end of 2002, http://www.bp.com; Oil and Gas Journal and World Oil as quoted on US Energy Information Administration website: http://www.eia.doe.gov, data for end-2001 (World Oil) and January 1st, 2003 (Oil and Gas Journal).

Technological progress in exploration and production of oil and gas has brought unconventional oil within reach and contributed to increased recovery rates in existing oil fields. As a matter of fact, oil reserves at the beginning of 2003 grew, according to the Oil and Gas Journal, with nearly 200 billion barrels. That

is an increase of substantially more than Iraq's current reserves of 112 billion barrels, the country that previously held the second largest reserve-base. The bulk of this increase in world oil reserves was due to the growth, compared to year-end 2001, of the Canadian reserves with almost 175 billion barrels when it included its oil sands to proven reserves. In terms of the feared concentration of oil reserves in but a few exporting countries, particularly in the Persian Gulf region, the new proven reserves data have changed the outlook, at least for the North American market, drastically.

The inclusion of the Canadian oil sands in proven reserves substantially improved the North American reserve position (See table 6.1). This positive development for the North American continent, and the US as the main importer, was further bolstered by the addition to reserves of another 17.5 billion barrels by Venezuela, an important supplier of the US market. This is a stark contrast with the reduction of proven oil reserves in Africa with about 18 billion barrels and the reduction in Asian reserves with about 17 billion barrels. Based on regional trading patterns in oil, the vulnerability of the US has reduced substantially with the rise of the reserves of its politically stable neighbour, while the vulnerability, based on domestic/ regional reserves, increased elsewhere.

The new reserve data did not, however, change the outlook of the EU and Asia much, except that competition for oil and gas resources from the United States might become less pressing in the future than anticipated a few years earlier. Particularly because the IEA estimates that the US still has substantial undiscovered resources.[44] The EU and Asia will continue to heavily rely on oil imports from the Middle East, Russia and the Caspian Sea region, regions that also are estimated to have large undiscovered resources.[45]

Oil production

In July 2003, world oil production was 78.3 million barrels a day, an increase of 8.6 million barrels since 1992[46]. The IEA World Energy Outlook 2002 predicts oil supply to grow to 88.8 million barrels per day in 2010, 104 mb/d in 2020 and 120 mb/d in 2030 (see figure 6.1).[47] The share of OPEC in world oil production is predicted to increase from 38.4% in 2000 to 54.1% in 2030. The share of the Middle East OPEC member states, which was 28.1% in 2000, is predicted to increase to 29.8% in 2010, 36.4% in 2020 and 42.9% in 2030. The Persian Gulf countries are predicted to produce 51.4 mb/d of oil, while the remainder of the OPEC countries are predicted to produce 13.5 mb/d in 2030. The Persian Gulf region will become an even more important supplier of the world oil market than it is today. It is clear that the future supply gap will be filled predominantly by production from the Persian Gulf countries.

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[42] Dicken, P., *Global Shift, The Internationalization of Economic Activity*, second edition, London: Paul Chapman Publishing, 1992, part II, pp. 91-227.

[43] Odell, P., presentation 21 May 2003, Wassenaar, the Netherlands, http://www.oranje-nassau.com.

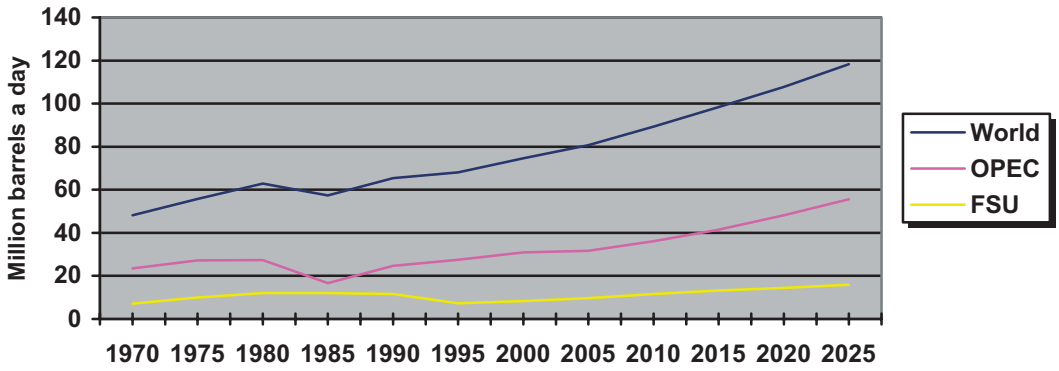
[44] IEA, *World Energy Outlook 2002*, Paris: OECD/IEA, table 3.5, pp. 97.

[45] Ibid.

[46] Petroleum Intelligence Weekly, Vol. 42, no. 33, August 18, 2003, p. 3.

[47] IEA, *World Energy Outlook 2002*, Paris: OECD/IEA, table 3.4, pp. 96.

Figure 3.2 World oil production: Recent history and future projections[48]



Source: Data from 1970 until 2000: BP, *StatisticalReview of World Energy*, June 2003. Projections from EIA's *International Energy Outlook 2003*, p. 238.

Whatever geopolitical changes we can imagine, the security of EU oil supplies (and of other consuming countries and regions) is seriously at stake when oil supplies from the Persian Gulf are jeopardised, which the predicted supply gap cannot be filled from elsewhere as the spare capacity elsewhere disappears. The size of the proven oil reserves and production capacity in place of the Persian Gulf countries is very large indeed. To be sure, the unrealised potential is large too.

Despite the disappointing call on Persian Gulf oil in the 1990s, the prediction for the next 20 years is that the call on Persian Gulf oil will increase dramatically due to increased world oil demand and maturing non-OPEC oil production. The Persian Gulf region is predicted to remain a very large surplus producer and the only region that is able to produce large volumes for the world market. The role of swing producer will continue to fall on the Persian Gulf. However, the ability to play this role depends on the political and economic stability of the countries in the Persian Gulf region.

Table 3.2 Proven reserves and production end-2002 of Persian Gulf countries

Country	Proven reserves in billion barrels	% of total	Production in thousand bbl/d	% of total
Iran	89.7	8.6	3366	4.7
Iraq	112.5	10.7	2030	2.8
Kuwait	96.5	9.2	1971	2.6
Saudi Arabia	261.8	25.0	8680	11.8
UAE	97.8	9.3	2270	3.0

Source: BP Statistical Review of World Energy 2003.

[48] FSU stands for Former Soviet Union: figures are for the combined production of Russia and all the (other) newly independent republics. Note that the projected production levels are based on the US government Energy Information Administration (EIA). These projections are sensitive to future oil price predictions.

In chapter 5, we will present some storylines on possible geopolitical developments. Normally speaking the stability of a region or country varies with the storyline. Yet, the risk of instability in the Persian Gulf is large under any storyline, because the causes of instability are mainly rooted in the domestic political and economic situation. Of course, the level of instability is also influenced by external intervention. In terms of security of oil supply and the possible policy responses, we will distinguish three situations: a stable Persian Gulf region, uncertainty in the Persian Gulf region and turmoil. Each situation represents different challenges to EU policy-making.

When the Persian Gulf Region is stable, EU policy-making can focus on maintaining good political and economic relations with the Persian Gulf countries. The expected oil supply gap will easily be filled. The EU can also expect the Persian Gulf to continue its important role in balancing demand and supply.

When the political and economic situation in the Persian Gulf is uncertain, security of oil supplies becomes an issue, unless remedies can be found. The supply shortfall will in an uncertain situation in the Gulf not be completely filled by the Gulf producers. In an uncertain environment, necessary investments in new Gulf production capacity may not be realised, either because governments are unable to generate the investment funds for the oil sector and do not allow the investment gap to be filled by private capital or private investors consider these investments too risky. International oil companies will find other investment opportunities in new production from elsewhere, such as the Caspian Sea region and Russia. This situation illustrates the developments of the past 10 years.

It is obvious that the supply shortfall can vary in size, depending on the level and duration of uncertainty and on the spill-over effects in neighbouring regions, such as the Caspian Sea region. We already mentioned unrealised new capacity. The uncertainty can also result in supply reductions from the Persian Gulf. The 1979 Iranian revolution, the Iran-Iraq war and the 1991 Gulf war and its aftermath all led to substantial reduction in supplies. The level of spare capacity in the international oil market, the availability of production capacity elsewhere and the development of demand determined the impact the supply reductions had on EU oil supplies.

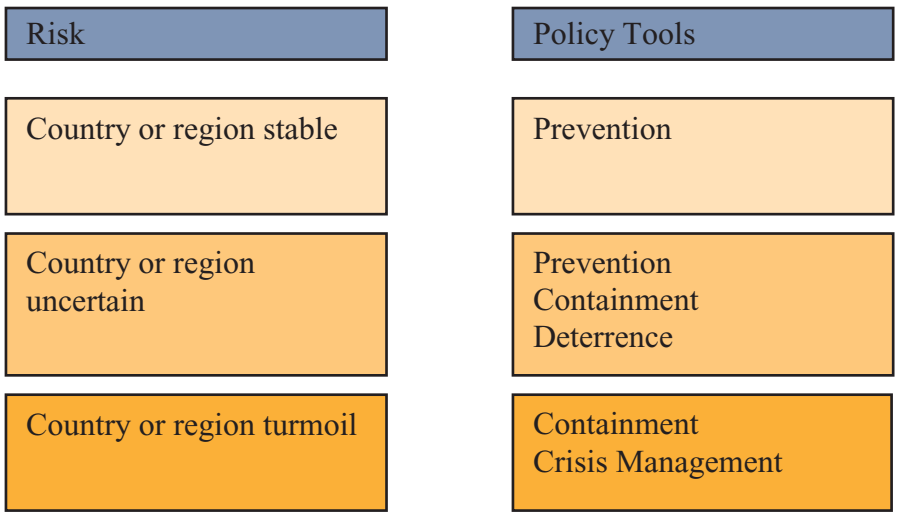
In a situation of prolonged uncertainty, the available spare capacity that is important for the stabilisation of oil prices can diminish or disappear all together. OPEC will not be able to implement effective market stabilisation policies and oil prices will become much more volatile. Second, the ability of the market to develop production capacity elsewhere to fill the Persian Gulf supply gap is constrained. In 2002, 18.9 million barrels per day were produced in the Persian Gulf region. The size of the reduction determines to a great extent the remedies that can be found in the market. If the market cannot remedy the growing supply gap, other policy options come to the fore.

The level of oil insecurity that is caused by the political uncertainty in the Persian Gulf region can vary among the consumer countries in terms of jeopardising the short, medium or long term oil security and can result in asymmetric ‘pain thresholds’, when more radical policy options, such as military intervention, are contemplated. The longstanding bad relations of the US with Iran, the dispute with Saddam Hussein’s Iraq, the ineffectiveness of the sanction regime and the uncertainty over the future of the Saudi-US special relationship after 9/11/2001 created a different threshold for the US than for the other major consumer regions. Both the EU and China maintained relations with Iran and Iraq that would potential-

ly secure their future supplies. Whilst uncertainty in the Persian Gulf region persisted for the US, the foreign policy options had not been exhausted to secure the flow of oil. From this perspective, the rift in the UN Security Council over Iraq is easier to comprehend. The US wanted to remedy the uncertainty and steer the Persian Gulf region into a direction that would create more stability for the US, while the remedy of countries like France, Germany and China to reduce the uncertainty in the Persian Gulf was focussed on containment of the uncertainty. This divergence of opinion on how best to remedy a prolonged situation of uncertainty in a vital region for oil security certainly is determined by the effectiveness and availability of the policy tool set. The EU and China were, for various reasons, not in a position to contemplate military intervention. Subsequently, the emphasis in policy tools lies elsewhere. Moreover, the fear of chaos was large and the EU's ability to remedy oil security in such a situation even more limited.

In a situation of turmoil in the Persian Gulf region most policy tools will be ineffective. Security of oil supply is very seriously threatened in such a situation and the supply gap will most likely be very large and acute. Depending on the duration of a Persian Gulf supply disruption, more radical instruments in energy policy are required, because strategic stocks only give short term relief and the ability to fill the supply gap with oil from elsewhere will be limited on short notice.

Figure 3.3 Schematic presentation of EU policy tools in case of stability, uncertainty and turmoil in a major oil and/or gas producing country or region



3.4.2 Gas

The international gas market was until recently a market divided in three regions of which two markets, the North American market and the European-Russian market, were typically pipeline markets, while the Asian market was a LNG market. The recent developments of gas in the Persian Gulf, Trinidad Tabago, Nigeria and the Sachalin developments have energised the international gas industry. LNG increasingly connects producing countries with more far-away markets. In the future more gas will be traded across continents to fulfil the growing demand for gas.

Gas Reserves

The world gas reserves are not as concentrated as the world oil reserves. Yet, two-thirds of the world's gas reserves are found in the Middle East, Caspian Sea region and Russia, the regions that the world also relies upon for their future oil supplies. The gas reserves of Russia and the other states of the former Soviet Union are vast with about a third of world proven gas reserves. These reserves are matched by the proven gas reserves in the Middle East. Particularly Iran has large reserves, about 15% of the world proven reserves. Other regions have more moderate reserves compared to Russia and the Middle East, but these reserves are substantial enough for developing the domestic gas markets and exports. The ratio of gas reserves to production is currently about 60 years, compared to about a little over 40 years for oil.[49] Intense exploration for gas is much more recent than oil exploration and in the past decades major additions to reserves have taken place. The natural gas industry is much less mature than the oil industry. Yet, with the predicted demand for gas to grow substantially, new additions to reserves are required to maintain the long term availability of gas. The current number of countries with significant gas reserves is about 90. In terms of probable reserves or resources, Russia and the other former states of the Soviet Union outstrip the Middle East in potential reserves. This again underpins the importance of Russia as an important supplier of the EU and in the future also the Chinese market.

Table 3.3 World natural gas reserves (tcf)

Continent/region	Oil & Gas Journal Jan 1, 2003	World Oil Year-end 2001	BP Year-end 2002
North America	252.354	271.285	252.400
Central & South America	250.083	250.223	250.200
Western Europe	191.568	182.440	186.200
Eastern Europe and Former SU	1964.175	1950.524	1930.000
Middle East	1979.675	2367.917	1979.700
Africa	418.162	477.059	418.100
Asia & Oceania	445.407	419.921	445.300
World Total	**5,501.424**	**5,919.369**	**5501.500**

Source:www.eia.doe.gov/emeu/international/reserves.htm

Contrary to the gas reserves of the former Soviet Union, the gas reserves of the Middle East hardly have been developed. The costs to bring the gas from the Middle East to the market were too large. As a result, most of the Middle East gas reserves were stranded. Only in the past decade, LNG projects in Qatar and Oman were developed to export gas.

Gas production

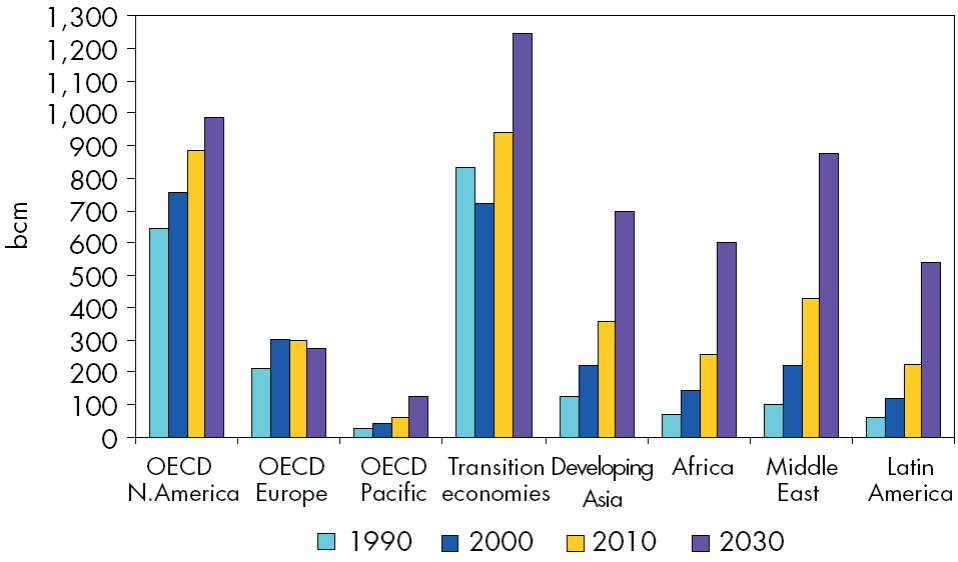
Gas production is particularly developed in the US, Europe and Russia. The share of production of North America was 30.3% in 2002, of Europe about 11.3% and Russia 22%, while the share of consumption

[49] IEA, *World Energy Outlook 2002*, p. 113.

of North America was 31.2%, of Europe 17.5% and Russia 15.3%.[50] The share of production of the Middle East was about 9.3% in 2002, while the share of consumption was 8.1%. The main exporters by pipeline are: Russia (128.2 bcm), Canada (108.8 bcm), Norway (61.2 bcm), the Netherlands (42.7 bcm) and (Algeria (30.9 bcm) and the main LNG exporters are: Indonesia (34.3 bcm), Algeria (26.8 bcm), Malaysia (20.5 bcm), and Qatar (18.6 bcm).[51]

The substantial increases in gas production in Asia, Africa, the Middle East and Latin America in figure 6.8 illustrates the fact that much gas was stranded and that developments in gas demand in the region and LNG are expected to unlock these reserves. Europe is the only region where gas production is close to peaking and production will level off in the coming decades. The dependence on imported gas will increase, and supplies from Russia, the Middle East and North Africa will expand substantially, if these new additions to production can be realised. Also the IEA recognises that there is a degree of uncertainty regarding the realisation of new production capacity.[52] These reservations are based on the costs of developing these capacities, the technologies that are required, the gas price developments, the oil and gas depletion rates, and the project risks in an uncertain geopolitical development.

Figure 3.4 Natural gas production by region



Source: IEA, *World Energy Outlook*, 2002, p. 115.

The vulnerability of the EU to a disruption of gas supplies is growing, partly because of the increased gas imports in general and partly because of the high dependence on a single source, Russia, of the new

[50] *BP Statistical Review of World Energy* 2003, p. 22 and 25.

[51] Ibid. p. 28.

[52] Ibid. p. 116; and see also CIEP, *The case for gas is not self-fulfilling*!, The Hague: CIEP/ Clingendael Energy Paper, 2003.

member states (see chapter 6). The ability to diversify to origin for the latter group is limited due to the fixed infrastructure and the organisation structure of the gas industry in Russia. The scope of the security of supply policy tools is limited and generally very costly for those member states. On the positive side, the indigenous gas production in a number of EU countries and the exports from the Netherlands and Norway does provide a certain share of domestic supplies which strategic gas reserves of France and Italy could provide some short term respite.

When it comes to security of EU gas supplies, the focus should be on Russia and Algeria. Both countries are dominant suppliers to Europe from outside the European Economic Area (EEA). While a successful growth of LNG imports will enhance the diversity of supply sources, the contribution of gas from Russia and Algeria is also expected to grow. The political and economic stability of Russia serves the security of gas supply of the EU. The EU and Russia can provide each other with security of supply and demand that fortifies their economic and political relationship. The fact that supplies from the Caspian Sea region, *in casu* Kazakhstan and Turkmenistan, are predominantly routed through the Russian pipeline system is in this market setting no problem. The awareness of the need to further integrate the Euro-Russian gas market is growing, but there are differences in the priorities attached to the transformation of the Russian and the EU market structure. The integration of the economies of the EU and Russia could become so deep that at some point in time they wish to institutionalise this in a free trade type of relationship first, and with time, accession to the EU later. Security of energy supply of the enlarged EU would further improve.

In a situation of general political uncertainty, the security of gas supply becomes more insecure. Whilst Russia continued to supply the EU during the break-up of the Soviet Union - a definite change to the geopolitical situation - it is obvious that political destabilisation in Russia, or economic uncertainty, could trigger a supply shortfall in future supplies. Apart from the risks of a supply interruption, investments that are required to satisfy the growing demand and to replace the mature gas fields in Russia might not materialise in time. Gazprom currently has a monopoly on gas production and on the development of new fields. Yet, the volumes of associated gas supplied by oil companies are growing and FDI in gas production were allowed, without Gazprom involvement, in Sakhalin. Political and/or economic uncertainty could prevent Gazprom to make the necessary investments, while FDI are still under discussion. Moreover, FDI in gas production will only materialize when these suppliers will get access to pipelines, or when they are allowed to build their own. Depending on the level of uncertainty, investments in new production and pipeline capacity could become so constrained that it can create a substantial supply gap.

The countries in the Middle East, and particularly Iran, have substantial gas reserves and a modest Russian supply gap could be filled with gas from Iran, other countries in the Middle Eastern and the Caspian Sea region, if the latter is not implicated in the uncertainty about Russia. The EU gas import infrastructure, that is currently heavily biased to handle Russian imports, would have to be developed with a certain degree of urgency. The assumption that infrastructure can be developed to handle imports from alternative sources only applies when the Russian supply gap emerges slowly. In a situation of a rapidly developing Russian shortfall, the other options, in the Caspian Sea and Middle East and the development of more LNG capacity in the EU, could not be developed in time.

The gas supply relationship with Algeria has been slightly bumpier. Starting as an LNG supplier, Algerian gas supply agreements with Europe were developed as part of larger arrangements of development aid between some European countries and Algeria, with France in a leading role. As a consequence, Algerian LNG prices were not competitive in the European gas market. The (potential) tensions around the efforts to negotiate more market-reflective prices took the parties to the brink of interruption of supplies. Since then, the Algerian pricing policies have become more aligned to market conditions in the EU and as a result Algeria has been able to increase its gas supply position considerably, with pipelines into Spain and Italy. While this has brought a greater economic interdependence between the EU and Algeria, the internal political situation in Algeria has not improved. Against this background, Spain decided to limit the share of Algerian gas to 60%. It remains a fact, of course, that there have never been problems in the supply of gas as a consequence of domestic unrest in Algeria.

The probability of a situation, in which the Russian supplies are uncertain and that the producers from the Middle East and Caspian Sea region provide a more certain investment climate and more secure gas flows, is small. At the same time, it is easier to imagine that Algeria will somehow be affected by the uncertainties in the Middle East/Persian Gulf region because the main political opposition in the country comes from Islamic groups. Spill-over effects on the Caspian Sea region and the longstanding uncertainties in the Middle East, makes a substantial diversification away from Russia hard to imagine. All the more so, because it is most likely that Caspian gas will have to be transported via Russian territories, through a system operated by (a) Russian firm(s).

As we argue later on, the policy tools that are available to address the Russian supply uncertainties are limited. It is clear that the radical policy choices, such as military intervention, are not available because of the military strength of Russia compared to the EU. The emphasis must be necessarily on foreign and trade policies and regular energy policies.

In a situation of turmoil, the gas supplies to the EU could be seriously jeopardized and a radical change in the energy policy of the member states will be required to deal with this situation.

4

Energy Policy Tools

4.1 Introduction

Energy security is one of the core elements of overall energy policy and is closely related to micro- and macroeconomic variables. Imports and export of energy may have an enormous impact on the balance of payments. Subsidies, taxation, and the costs or revenues of state-owned companies may have a considerable influence on the state budget. Moreover, the costs of energy are an important factor in the rate of inflation and in the international competitive position of a country's economy[53]. The fact that the supply and consumption of, for instance, oil products are part of the overall supply and consumption of energy in an economy and that, to some degree, various types of energy and fuels can be substituted for each other implies that security of supply policy has to be considered in the context of overall energy policy. Energy flows are also part of trade and balance of payment policy, for instance by stimulating crude oil imports rather than oil product imports with tariffs on processed oil. Given the fact that oil and increasingly also gas are such a vital input in the economy, energy is also part of foreign and security policy-making. This makes energy policy an extremely complex issue, in which balances have to be found between numerous, often conflicting, objectives, approaches and interests. This section will provide an overview of possible approaches and instruments, particular from the perspective of consumer countries.

4.2 Energy policy

Energy policy in consumer countries involves three main components. First, we can determine the basic aims of energy policy: a) low supply costs, b) security of supply, i.e. the continuity of supply and the dispersion of risks and, more recently, c) environmental considerations. These basic aims are shared widely among consumer country governments, international organizations, etc. This, however, is not the case with the other two levels of energy policy, where even among the European countries there is a wide variation in the policy and policy instrument choices. At the second level, we can investigate how these basic aims are or can be achieved. The way in which these basic aims can be achieved varies among countries, depend, for instance, on their domestic resource endowments and other policy choices. To achieve their energy policy goals countries make decisions on a) the balance between domestic and imported sources, b) the balance between different types of technology and, c) the balance between costs, environmental and national security considerations. At the third level of energy policy, countries choose among the various policy instruments at their disposal. These may include taxation, subsidization, public ownership, regulation etc.[54]

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[53] See Bohi, D.R., Toman, M.A., "Energy Security: Externalities and Policies", *Energy Policy*, Vol. 21, no. 11, 1993.

[54] Correljé, A.F., *The Spanish Oil Industry: Structural Change and Modernization*, Amsterdam, Thesis Publishers, 1994, pp. 7-11. Helm, D., "Energy policy: security of supply, sustainability and competition", *Energy Policy* 30, pp. 173-184, 2002. Helm, D., *Energy, the State, and the Market: British Energy Policy since 1979*, Oxford University Press, 2003.

Several factors explain the variation in the choice of policies and instruments among countries at the second and the third level. There are, first, technical, natural and economical constraints, such as the varying energy resources endowments, the structure of the economy, the structure and size of consumption per capita, and the geographic location. A second group of factors involve national peculiarities with regard to the organization of the energy sector and the economy, such as the institutional structure, traditions and culture, and the balance of power between various national interest groups. Distinct institutional structures in EU member states have led to marked variations in the objectives and instruments of energy policy in these countries.

4.3 Import vulnerability

Security of supply is often the most important reason why countries try to be as independent as possible with regard to the supply of their energy requirements. This explanation is based on the idea that dependence on imported energy resources might become a strategic (geopolitical) disadvantage in times of war or that such an economic vulnerability could be used as a weapon in trade conflicts. Moreover, it would make countries vulnerable to price fluctuations in international markets, cause disturbances in their balances of payments, economic growth, etc. Of course, indigenous energy production is not always more secure than imports. It is particularly vulnerable to industrial action by labour unions, as a vital industry. The example of the UK coal sector is a case in point[55].

4.4 Security of supply policy tools

In this section the policy instruments will be discussed which are in use worldwide to enhance security of supply. We distinguish instruments for the following objectives: 1) *Prevention*, creating a political environment which reduces the possible grounds for supply disruptions; 2) *Deterrence*, providing the political and associated means to keep producers from interrupting supplies for political reasons; 3) *Containment*, reducing the effect of a supply interruption on national security and the economy.

The distinction between these policy objectives is obvious. The policy instruments or tools to achieve the policy objectives, however, often help in respect of both prevention and containment and sometimes even deterrence (See Figure 6.1). Also they may be necessary preconditions for an effective management of a crisis. A good example of this multi-functionality is the strategic oil reserve. Strategic oil reserves if they are large enough can deter a producing country from tightening supply because they know that a release from the stocks will follow and the resultant price impact can be negative for the producing country's income. A release from the strategic oil reserve can also contain a crisis, because the availability of oil is kept at a higher level than without the release. In a situation of acute disruption, the strategic reserves allow the country to consume oil without receiving new supplies. So, in such situations, the strategic reserve is employed to achieve different elements of security of supply. Other policy tools, like diversification and energy system flexibility, have a more limited scope. Diversification policies can both prevent and contain a disruption. Energy system flexibility can also deter a producer country to invoke a supply disruption, because the impact will be limited and more likely harm the producer country more than the consumer country. Promoting diversified portfolios of FDI in the oil and gas of major producing countries will help to prevent and contain the impact of a disruption of supplies. A producer coun-

[55] Parker, M.J., *Thatcherism and the Fall of Coal*, Oxford University Press, Oxford Institute for Energy Studies, 2000.

try that is deeply integrated in the world market and has developed the energy sectors with foreign capital will be deterred to break the economic rules of the game for fear of becoming locked out of capital markets and other economic interdependencies. Despite the vague distinction between the effects of the policy tools, the objectives are clear. The family of security of supply policies together provide a consumer country with effective tools to reduce the impact of a supply disruption.

4.4.1 Domestic supplies

Energy security is very large in a situation where domestically produced energies supply the market. If a country is endowed with domestic energy resources, it can decide *to favour its domestic energy industry*. If the industry can easily compete with external energy sources nothing much in terms of energy policy needs to be done. The EU is endowed with coal, oil and gas resources, but it is far from self-sufficient. Nor is all EU energy production internationally competitive. The coal industry, in some member states, has been the recipient of large subsidies to maintain production and the accompanying employment. These subsidies are being gradually phased out. As a consequence, the coal industry in these countries will probably be closed down, resulting in a switch to imported fuels.

Trade policy provides other policy tools to switch demand away from imported energy through the use of tariffs, or non-tariff barriers. Tariffs are usually not applied on unprocessed goods and tariffs have been negotiated down to fairly low levels in the framework of GATT/WTO. Tariffs have been applied on processed energy products, such as gasoline and diesel, to protect the local refining industry from competition of lower priced imported fuels. In the 1950s and 1960s, trade policy was used to stimulate refining in European countries rather than importing the, more expensive, oil products. Oil exporting countries, such as the OPEC countries, are afraid that environmental policies and fiscal policies will be used as a barrier to trade in oil and thus promote other, domestic, energy sources.

If a country is not endowed with domestic hydrocarbon based energy resources and the government still wants to reduce energy imports, it can decide to develop nuclear capacity, and renewable energy, like wind and solar. These non-fossil solutions are, however, very expensive to develop and may require long periods of government support, before they become commercially viable. This, of course, also depends on the level of the fossil fuel prices. France developed much of its nuclear capacity in the period between 1980 and 1984, when OPEC kept oil prices relatively high. The development of non-fossil fuel energy resources is presently also stimulated by the CO_2 emission abatement policies that EU countries have to implement. It is possible that the development of sustainable energy sources gets an additional boost, apart from the environmental motives, from the fact that these domestically produced energies can reduce the security of supply vulnerability to some extent. Yet it must be noted that this policy can be very expensive for taxpayers and perhaps these costs may not be in proportion to the risks in the security of supply or the efficiency of other security of supply policies.

4.4.2 Diversification

Diversity is a broad concept. It can refer to: fuel types (diversity of energy mix), fuel sources (by company and by origin of imports), technology types and technology sources.[56] *Diversification to source* is also possible within the group of fossil fuels. A large dependency on only one of the fossil fuels increas-

[56] NERA, *op. cit.*, 2002, p. 7.

es the vulnerability to supply disruption. In general, *diversity* in energy supply, by type and by origin, is considered to produce more security.[57] However, diversity does not lead to improved security if less reliable sources of energy (for instance wind energy) are introduced. Perhaps, the establishment of proper gas or oil storage facilities would have created more security than diversification.

In the past 20 years, the emergence of gas has helped to create a more diverse energy mix. For example, Italy has successfully reduced its dependence on oil by promoting a switch to gas. The new member states still rely heavily on coal, and to a lesser extend on mostly imported oil and gas. On average the contribution of coal, oil, gas and nuclear is 15%, 43%, 24% and 13% respectively in the EU-15 and 18%, 40%, 24% and 13% respectively in the EU-25. In comparison, the energy mix in the US is 24%, 39%, 26% and 8% respectively, and its dependence on imports is 61% for oil, and 18% for gas. The United States is a coal exporter. In general, the security of supply risk is smaller in a more balanced energy mix because the origin of coal, oil, and gas is not similar. Nevertheless, the ability to switch fuels in consumption is limited, although in electricity generation dual or multi-firing capacity is possible.

Table 4.1 Consumption per fuel type in Mtoe: 2002

Country	Oil		Gas		Coal		Nuclear		Renew.		Total	
Austria	13.0	40%	7.3	22%	3.5	11%	-	-	8.9	27%	32.7	100%
Belg & Lux	32.9	52%	13.4	21%	7.3	11%	9.7	15%	0.5	8%	63.8	100%
Denmark	9.8	53%	4.6	25%	4.2	22%	-	-	N/A	N/A	18.6	100%
Finland	10.9	41%	3.7	14%	4.5	17%	5.1	19%	2.5	9%	26.6	100%
France	92.8	36%	38.5	15%	12.7	5%	98.9	38%	15.0	6%	258.0	100%
Germany	127.2	39%	74.3	22%	84.6	26%	37.3	11%	5.9	2%	329.4	100%
Greece	21.8	64%	1.8	5%	9.9	29%	N/A	N/A	0.8	2%	34.2	100%
Ireland	8.7	60%	3.7	26%	1.8	12%	N/A	N/A	0.3	2%	14.4	100%
Italy	92.9	53%	57.2	33%	13.8	8%	N/A	N/A	10.9	6%	174.8	100%
Netherlands	43.8	49%	35.4	40%	8.9	10%	0.9	1%	N/A	N/A	89.0	100%
Portugal	14.9	62%	2.7	11%	5.0	21%	N/A	N/A	1.5	6%	24.1	100%
Spain	73.5	55%	18.8	14%	21.9	16%	14.3	11%	6.1	4%	134.5	100%
Sweden	15.0	31%	0.7	1%	2.2	5%	15.6	32%	15.1	31%	48.5	100%
UK	77.2	35%	85.1	39%	36.5	16%	19.9	9%	1.7	1%	220.3	100%
EU 15	**634.4**	**43%**	**347.2**	**24%**	**216.8**	**15%**	**201.7**	**13%**	**69.2**	**5%**	**1468.9**	**100%**
EU 22[58]	**689.7**	**40%**	**403.7**	**24%**	**314.6**	**18%**	**222.3**	**13%**	**76.2**	**4%**	**1706.2**	**100%**
US	**894.3**	**39%**	**600.7**	**26%**	**553.8**	**24%**	**185.8**	**8%**	**58.2**	**2%**	**2293**	**100%**

Source: BP *Statistical Review of World Energy 2003*.

Diversification to origin in oil has greatly expanded in the last 20 years. The number of oil producing countries has increased substantially and import dependency on OPEC imports was reduced by production in Norway and the UK. After the oil crises of the 1970s, oil imports from 'safe' countries were promoted. The rapid expansion of international oil trade has created more transparency, including the abil-

ity to arbitrate prices in the international market and hedge price risks in the various markets. The concentration of oil reserves in the Persian Gulf region (about 65% of proven oil reserves) and the maturity of oil production in OECD countries will create a larger future import dependency on fewer suppliers.

The potential to *diversify by origin* for gas is more limited than that for oil. Firstly, the supply routes for gas are much more rigid, as most gas is transported through dedicated, specific pipelines. Another method to move gas over large distances is to transport Liquefied Natural Gas (LNG) per ship and to gasify the gas it in the importing country. Where the choice exists to transport gas by pipeline or as LNG, it is determined by geopolitical and market factors as well as the distance from production site to consumers and costs associated with that transportation.[59] Technological improvements and other efficiencies have reduced the costs of LNG and have made it feasible for more sources of LNG to be sold into the EU. This has brought some degree of diversification in the EU.

The security of supply in coal is generally not considered to be a problem because of the distribution of the coal reserves and production in the world, the size of the reserves and the organisation of the market. Increasing the consumption of coal, however, runs counter to the policy to reduce CO_2 emissions. Clean coal technologies are available but make coal less attractive in competition with other fuels.

4.4.3 Energy system flexibility

Security of supply can also be greatly enhanced by *flexibility in the energy system*. Flexibility in the energy system can be achieved with a variety of measures. These can be technical, operational or economic in nature. Cars and trucks are using single fuels, normally, gasoline or diesel. A small fraction of the cars can both use gasoline and LPG. The greatest opportunity for flexibility in the energy system is in the generation of electricity. We already mentioned the balance in the energy mix and dual or multi-firing capacity. Spare capacity in the energy system can serve as some sort of strategic stock that allows the system to re-route flows or temporarily change the energy mix. If a country wants to provide such capacity, it will need to impose such requirements on the industry. Special arrangements or allowances (such as a tariff system or long term contracts) need to be made, for investors to recoup the costs of maintaining spare capacity, strategic stocks and other emergency response measures, such as dual or multi-firing electricity plants. Otherwise, the incentive will be lacking to invest in the flexible operational capacity, storage capacity, by-passes in transportation and other systems, which will make a robust, flexible energy system. Such safeguards normally come under stress in liberalised energy markets without proper regulatory measures, because short-term private interests override the longer-term collective interest of security of supply.[60]

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[57] NERA, *Security in Gas and Electricity Markets, final report for the Department of Trade and Industry*, ref: 003/08 SGEM/DH, London, 21 October 2002, p. 7.

[58] Including Bulgaria, Czech Republic, Hungary, Lithuania, Poland, Romania and Slovakia.

[59] CIEP, *The Role of Liquefied Natural Gas (LNG) in the European Gas Market*, The Hague: Clingendael International Energy Programme, 2003, pp. 9-12.

[60] The blackout on 15 August in the US Northeast power grid is an example of the possible consequences of incomplete deregulation, that left investors and utilities confused and with little incentive to invest in transmission. The Economist, “Bring me your powerless masses, special report on America’s electricity crisis”, 23 August 2003, pp. 18-20.

4.4.4 Crisis management

Strategic stocks in oil have been the backbone of the international energy co-operation among the OECD member states[61]. The effectiveness in responding to a supply disruption of a strategic stock is not only determined by their volume, but also by the availability of the facilities to transport and to process the oil for the market where the shortfall arises. A lack of transportation or processing capacity can prevent an efficient release from a strategic stock in a country. Moreover, a disruption in supply may coincide with the removal of transportation capacity or processing capacity from the market, for example, when these are owned and controlled by the producer(s). In 1990, the removal of the market of Kuwait's refining capacity created tight product supplies and in 2000, the US refining capacity was insufficient to meet US product demand. Oil released from the strategic petroleum reserve could not be processed and was therefore inefficient. It would therefore be advisable for the US to improve the quality of the strategic petroleum reserves by including oil products. Japan and the EU are also protected to some degree for a fall-out of refining capacity, by crude and product stocks.

Strategic gas stocks are being held by France, Italy and, also more recently, by Spain. The volume of storage for gas varies widely among these states.[62] The EU Commission has proposed to establish an obligation for member states to hold strategic gas reserves. Yet, this proposal has been withdrawn. As a tool, the storage of gas is considerably more expensive and geologically and logistically far less effective than oil stocks. The costs of gas storage are determined by the availability of adequate geological facilities, like gas fields and salt caverns of the right size and characteristics. These facilities are unevenly spread among the member states. If member states were to store gas in other member states, the lack of sufficient infrastructure poses very severe logistical and cost limitations. Given these constraints it is unlikely that this tool is cost-effective for certain countries and will certainly make its difficult to impose.

Pricing policy and regulation has been widely debated in the context of liberalising energy markets. The notorious price cap in California probably made governments much more careful in implementing price restraints. However, as a crisis mechanism, when markets fail to absorb a supply disruption shock, *price policy* could be an efficient crisis management tool. The implementation of energy price policy, however, should be subject to a strict and transparent definition of when this instrument is employed (such as under IEP of the IEA) to prevent unnecessary uncertainty for the market players. Price policy can provide consumer protection with the implementation of a maximum price for a limited period of time. This maximum price can, in the event the crisis is more prolonged than a few months, be slowly increased, according to an agreed schedule. In the later case, the consumer is protected for a sudden price shock and not for the full price increase itself. Price policy can also protect producers of energy against such low price levels that their investments and the security of the energy system, is endangered. The price band of energy prices during a crisis could be determined in relation to the dynamic level of the security of the energy system that is required.

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[61] Jaffe, A.M., Soligo, R., 'The role of inventories in oil market stability', *The Quarterly Review of Economics and Finance*, Vol. 42, p. 401-415, 2002; Leiby, Paul N, Bowman, D., Jones, Donald W., "Improving Energy Security Through an International Cooperative Approach to Emergency Oil Stockpiling," Proceedings of the 25th Annual IAEE International Conference, June 26-29, Aberdeen, Scotland, 2002.

[62] NERA, *Op. cit.*, 2002, table 12.2, p. 75.

In the case of a low oil price shock, companies are able to absorb these shocks for a limited period of time, as long as variable costs are recovered. They are particularly hurt by a prolonged low oil price, because of the inability to recover part of the variable and most of the fixed costs.

Whereas the non-OPEC oil companies normally generate a proper return at prices above $12 per barrel, at lower prices a 'shake out' could take place. It is exactly for this reason that, in 1974, the IEA minimum price was developed. Despite the fact that in 1974 it was developed in a world that radically differed from today, a review of this policy tool could be rational. Particularly, in the light of the fact that non-OPEC oil production is predicted to come under considerable pressure in the future, while the share of OPEC is expected to grow.[63] Of course, judgments on the effectiveness of this tool will depend on whether or not the OPEC countries will open up their oil industry for FDI. If the international companies will gain access to low cost production countries, like Iraq, their economic vulnerability will be reduced and the minimum price requirement could perhaps remain the same. If access to low cost oil does not materialize, the level of $7 per barrel is possibly too low today. The price level in 1998, between $10-12, created strains in the oil industry, so that the companies engaged in a substantial consolidation of their market positions and that a production cut by OPEC was welcomed. The burden of market stabilization has been very costly for some of the OPEC member states and requires sufficient levels of solidarity to be effective.[64] In OPEC history we have seen periods in which this level of co-operation among the OPEC member states was not present.

In a review of the minimum price level, an assessment should be made if such a price would also positively affect investments in gas and gas flows and, in general, if such a minimum price would support the energy security of the IEA countries. The EU should perform its own assessment and perhaps, when the IEA countries decide not to change the current minimum price level and the EU would prefer to implement a change, the EU could contemplate the introduction of a EU minimum price that reflects the specific EU needs.

4.5 Foreign and security policy

Foreign and security policy can be an important part of safeguarding energy system security. Creating sound and meaningful political and economic relations between producing and consuming countries can prevent a situation in which countries engage in acts that hurt each other. Foreign policy should be part and parcel of crisis prevention policy-making. With regard to energy security we can distinguish bilateral and multilateral policies, in addition to the co-operation in the framework of the United Nations organisations, such as the World Bank, Unctad, UNDP, IAEA, etc.

4.5.1 Special bi-lateral relationships

The special US-Saudi bilateral relationship served the energy security of the US. The US energy security was 'traded' for protecting the integrity of Saudi Arabia as a country and to protect the Saudi regime for external and internal threats. For many years, Saudi Arabia received US military equipment and assistance. After 9/11/2001, the relationship became unusually strained because the majority of the highjack-

63 IEA, *World Energy Outlook 2002,* Paris: OECD/IEA, 2002, pp. 94, 95.

64 Van der Linde, C., *Op. cit*., 2000, Chapter 5.

ers turned out to be Saudi nationals. In addition, an undisclosed part of the report on 9/11/2001 stated that senior Saudi nationals are claimed to have supported Al-Qa'eda.[65] It was already known that Saudi financial support for all sorts of Islamic groups, including Al-Qa'eda, had been given in the past. With the US-Saudi relationship under strain, energy security of the US is at greater risk than before. Jeffrey Sachs[66] claims that the sour Saudi-US relationship was one of the main reasons for the Americans to go ahead with the intervention in Iraq because, apart from removing Saddam Hussein, it allowed them to create a new military presence in the Persian Gulf region and unlock the Iraqi oil potential for the international oil market.

It is clear that special relationships between significant energy producer and consumer countries contribute to energy security An example of a special relationship in the making is the EU-Russia relationship that is also inspired (among other things) by energy security. In this case, the Russians seek security of demand for oil and gas (and income) and the EU seeks security of supply. The initiative by prime-minister Ruud Lubbers in the late 1980s to create a European Energy House, in a response to Soviet Party Leader Gorbashov's proposal for Perestroika and the creation of a European House. The Lubbers initiative eventually led to the European Energy Charter. Many more countries than the initially intended European countries and the countries of the former Soviet Union ratified the Charter. The collapse of the Soviet Union and the fear that the EU would gain some sort of preferential access to the Caspian Sea and Russia's energy resources resulted in diplomatic pressure from the US to open up the charter discussions for every government interested. In the end, both Russia and the US ended up not ratifying the charter and the initial idea for special European-CIS energy cooperation severely weakened. In the Putin-Prodi discussions the non-ratification of Russia has become some sort of an issue (just like the Russian ratification of the Kyoto Protocol). The EU must take care not to develop this issue to a point where it backfires on the original intention of the Energy Charter, particularly, while Russia is already acting according to the Charter practices in many areas. The deepening of the EU-Russia special relationship seems a logical development because the energy markets, but specially the gas market, are already fairly integrated. Russia supplies the European Union with 74.9 bcm of gas per year, which is about 19% of total gas consumed. The IEA predicts that gas supplies will expand to 244 bcm in 2030.[67] Also deliveries of oil to the EU market have been increasing, although the access to warm water harbour facilities is an issue. Much of the Russian oil is exported through the Black Sea port of Novorossiysk and then shipped through the Bosporus on to the Mediterranean and beyond. The narrow strait does not only cause frequent delays for ships wanting to pass through, but also security and environmental concerns have been raised because the ships have to pass a densely populated area. Fears that a shipping accident will cause danger to the population and the environment are mounting with the increased maritime activity. Turkey would prefer oil to be transferred by pipeline from the Turkish Black Sea coast to the Mediterranean coast, and collect the transfer fees, but Russia so far has insisted on its free passage to international waters.

Japan and Indonesia also have such a special relationship, although the relationship is predominantly economic. It is also clear that past and present power politics have played an important role in the Middle

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[65] Financial Times, "September 11 Report raises Saudi Question", July 24, 2003.

[66] Sachs, J., "The Real Target of the War in Iraq was Saudi Arabia", Financial Times, 13 August, 2003.

[67] IEA, *World Energy Outlook 2002*, p. 119. See also figure 6.17.

East and the Caspian Sea region. In general, significant oil and gas producers receive willingly or unwillingly special attention from major consumers like the US and recently also China. The European countries operate their energy strategies on a national basis. The weakly developed foreign policy of the EU and the non-existent security policy is both the cause and the effect of this national approach. This weakly developed policy at the EU level can be partly explained by the conflicting post-colonial ties of the major EU countries. Particularly the French and the British governments are widely diverging in their approach and relations with Arab producing countries. The different approach of the French and the British governments towards the Arab countries came to the fore again in the recent conflict over Iraq, where they found themselves at completely opposing positions.

Euro-Mediterranean Partnership (EMP)
The partnership between the European Union and non-EU member states bordering on the Mediterranean was set up in the 1990s in order to facilitate trade relations. So far, only limited progress has been made. The goal of this process was to help speed up the pace of economic reforms and growth in the Southern Mediterranean countries. A deeper level of integration between the EU and these countries would facilitate investments in the Mediterranean economies, including their energy industries. By concluding bilateral agreements with the EU, the Middle Eastern & North African countries could thus exploit their geographical proximity to the EU on a more systematic basis.[68] The EU could support this.

Gulf Cooperation Council (GCC)
The GCC is a regional organisation created in 1981 by Kuwait, Saudi Arabia, Bahrain, the United Arab Emirates, Qatar and Oman. Under a Cooperation Agreement the EU meets on a regular basis with GCC representatives. The goal of the agreement and of the meetings is to facilitate trade relations. Also, the EU seeks to strengthen regional stability under the Agreement. The EU has a positive trade balance with the GCC countries.[69]

4.5.2 Multilateral co-operation

OPEC
Energy has been a source of a *variety of multi-lateral co-operation initiatives*. In 1960, Venezuela, Iraq, Iran, Kuwait and Saudi Arabia established the Organization of Petroleum Exporting Countries (OPEC). In the 1960s more oil exporting countries joined, also smaller exporters, and in 1974 13 countries were members of the organisation.[70] The countries organised in OPEC wanted more control over their oil industry and income deriving from oil exports.[71] Their oil was predominantly produced by a group of 7 large international oil companies that had acquired concessions in the countries prior to 1945. Through the interlocking directorates of the joint-ventures, these oil companies had tight control over production

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[68] Müller-Jensch, D., *Economic Prospects for the Euro-Mediterranean Partnership: Deeper Integration and Trade in Services*, World Bank/European Commission PPMI, 2003, p. 33.

[69] http://europa.eu.int/comm/external_relations/gulf_cooperation/intro/

[70] OPEC's member states are: the 5 founding member states: Iran, Iraq, Kuwait, Saudi Arabia and Venezuela, member countries that joined later: Algeria, Ecuador, Gabon, Indonesia, Libya, Nigeria, Qatar, and the United Arab Emirates (UAE). In the 1990s Ecuador and Gabon decided to leave the OPEC.

[71] Van der Linde, *Op. cit.*, 1991, pp. 145-178.

and pricing in these countries. The royalties and tax payments that the companies paid to the producer governments were considered too modest compared to the profits of the companies. When new oil producing countries in North Africa negotiated for much better terms in the late 1950s and early 1960s and managed to attract a wider variety of companies to their upstream industry, the so called Independents, the other producing countries wanted better terms as well.[72] In the early 1970s the international oil market was tight enough for the producer countries to gain a more prominent negotiation position.[73] Better terms were achieved in the Tripoli and Teheran agreements of 1971, while an understanding was reached, that negotiations about a slow nationalisation would open shortly. The October war between Egypt, Jordan, Syria and Israel became a turning point. The Arab oil producing countries, united in the Organization for Arab Petroleum Exporting Countries (OAPEC) decided to underpin their demands in that conflict with the employment of the oil weapon (boycott of the US, the Netherlands and Portugal). OPEC then decided to increase oil prices and to stop the negations on price with the international oil companies. OPEC had gained control over pricing and production. By the end of the 1970s, the nationalisation process in the Persian Gulf was completed.

The success of OPEC to stabilise the international oil market from 1973 onwards has been mixed. Mixed in the sense that the organisation made some unsound judgements with regard to the sustainability of the price and production policies they implemented. An example is the price increase in 1980, which forced OPEC to greatly reduce supply and initiated a structural fuel switch in consumer countries in electricity generation. Another example is the production increase in December 1997 on the eve of the Asian Financial crisis, when demand for oil in Asia dropped and as a resulted OPEC's oversupply caused the oil price to crash. Mixed success also with regard to the achievement of greater economic welfare for the population of the OPEC member states that was much harder to attain than anticipated. In 1973, the OPEC member states could overcome their differences in resources, production capacity etc., because they had a common goal, but after that goal was achieved, more control, the differences in preferred prices and production prices began to undermine the cohesion among the member states. Yet the task of stabilising the international oil market is very difficult, also for OPEC, and the oil market would have been much more instable without OPEC regulating supply.[74] The role of the Persian Gulf producers' spare capacity has been very important for the flexibility with which OPEC, or some of its member states, could respond. However, there are growing limitations to the flexibility of the producers to vary supply. This due to the income needs of these flexible suppliers.[75] The political and economic developments in the Persian Gulf have reduced the number of flexible producers. Iraq would technically be such a flexible producer, but could never play this role.[76] As a result, Saudi Arabia, the UEA and Kuwait had to carry must of the burden and costs of stabilising the market.[77] The cost of stabilisation is very high indeed. Many times OPEC reduced production levels only to see that other non-OPEC producers happi-

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[72] Van der Linde, *Op. cit.*, 1991, pp. 116-144.

[73] Noreng, O., *Crude Power, Politics and the Oil market*, London/New York: I.B. Tauris Publishers, 2002, pp. 133-146.

[74] Noreng, *Op. cit.*, 2002, p. 145.

[75] Van der Linde, *Op. cit.*, 2000, pp. 81-96.

[76] Van der Linde, C., "Is Iraq a Gamechanger", in: Van Staden, A., Rood, J., Labohm, H. (eds.), *Canons and Cannons, Clingendael Views of Global and Regional Politics*, Assen: Royal Van Gorcum, forthcoming 2003, pp. 330, 346.

ly filled the gap, which left the large OPEC producers with less income and a lower price level than agreed. This was a problem that developed in the 1990s[78].

Subsequently, OPEC has pursued better relations with other large exporting countries, such as Mexico, Norway and to a lesser extent Russia to discuss oil policy and acquire the support of these non-member states for the stabilisation of the market. In the 1990s security of demand became a more and more important issue for the oil producing countries. The discussions on the implementation of the Kyoto Protocol that the OPEC countries saw as a direct threat to their security of demand made dialogue with consumer countries more important. As a result, discussions on issues concerning the development of the oil and gas market between OPEC and the International Energy Agency (IEA) were initiated. Also, discussions on energy matters in what was first called the producer-consumer dialogue and has now been renamed the International Energy Forum intensified in the last decade.

The international energy agency

Since the 1950s, energy developments in Europe were monitored and interpreted through the Organisation of European Economic Cooperation (OEEC) and later the Organisation of Economic Cooperation and Development (OECD), in Paris and the United Nations Economic Commission for Europe (UNECE), in Geneva. Essentially, this involved the publication of reports and statistics, indicating the need for investments in the several segments of the energy sector. The oil crisis of 1973/1974 resulted in the establishment of the International Energy Agency, attached to the OECD. The United States took the initiative to invite a selected group of countries for a conference in February 1974 on the establishment of a consumer cartel, as a counterweight to the producer cartel OPEC. The invitations led to immediate uproar because not all the EU member states were invited, and those that had been invited had accepted to attend without prior consultations in the EU.[79] In the end, all 9 EU member states attended the Washington conference. It was clear, however, that the American approach was not welcomed by all the member states. France was, for example, opposed to the provocative position of the US to create a consumer cartel.[80] The French were proponents of closer co-operation with the Arab countries and had, to that effect, organised a delegation to gatecrash the EU summit in Copenhagen in December 1973. The outcome of that December meeting was that a Euro-Arab Dialogue would be started in which oil was prominent on the agenda (and later removed under diplomatic pressure of the US).[81] In the end the language of the closing statement of the Washington conference was much less belligerent than first proposed and the International Energy Agency became part of the Organisation of Economic Co-operation and development (OECD) in Paris. The fact that the seat of the IEA ended up in Paris was somewhat

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[77] Van der Linde, *Op. cit.*, 2000, pp. 74-80.

[78] Claes, D.H., *The Politics of oil-producer cooperation*, Boulder Colorado, Westview Press (2001).

[79] Lefeber, Van der Linde, *Op. cit.*, 1987.

[80] When the traumatic war in Algeria finished, the foreign policy of France underwent a radical change. This became evident in the withdrawal of support for Israel during the Six Day war in 1968 and the refusal to deliver fighter planes. Prior to that, France had supported Israel and had fought with the British along with the Israeli's in the Suez Crisis. The French foreign policy closely followed the economic interests of France. When the war in Algeria was over, France made a tremendous effort to build intimate relations with Arab countries. A policy that they still follow today.

[81] Lefeber, Van der Linde, *Op. cit.*, 1987.

cynical because the French decided not to join the IEA until much later when the political heat had subsided. Yet from a foreign policy point of view, the French had been successful in preventing a producer-consumer collision course for the IEA and they had convinced the EU countries to engage in the Euro-Arab Dialogue.[82]

The French were also in favour of developing a common EU energy policy. At the EU summit in Copenhagen in December 1973, they had convinced the other member states to develop this policy. It was, however, clear that a common energy policy was one bridge too far for some of the member states that preferred inter-governmental co-operation rather than intra-governmental co-operation.[83] Particularly, the United Kingdom, the Netherlands and Germany preferred the inter-governmental approach because they wanted to maintain sovereignty over their own energy industries. The United Kingdom had joined the EU on 1 January of 1973, together with Ireland and Denmark, after much political wrangling. To give up UK energy policy amidst a serious crisis ran counter to the British European policy. For the Netherlands, in particular, the oil boycott had been traumatic because the level of assistance from other EU countries was disappointing. Only after they had threatened to reduce gas exports did oil sharing among the member states materialise. The fundamental divisions in security of supply policies and foreign policy towards the oil producing countries are still prevailing today. In the end, the IEA and the accompanying crisis mechanism was accepted 1 month ahead of the acceptance of developing a common energy policy, in November 1974. The EU member states created a situation where the prior treaty obligations towards the IEA effectively took preference over the common energy policy. Thus the development of a common energy policy was severely hindered by the bilateral decision to join the IEA and IEP first. The tension between the IEA and the development of EU energy policy continues until today as evidenced in the discussion on increasing the strategic oil reserves in 2002 and 2003.[84]

In the end the EU energy policy was predominantly focussed on mimicking the IEP policy measures in an EU framework with the purpose to bring France under a similar regime without having to join the IEA. From a foreign and energy policy point of view, the events of 1973/1974 set back the hopes for deeper integration of the energy market and energy policy-making (see also section 3.5.). For the IEA, the lack of agreement among the 9 EU member states on foreign and energy policy immediately upgraded the importance of the IEA as the forum where energy issues were discussed among consumer countries.

The implementation of the IEP in 1974 meant that the IEA member countries agreed on oil crisis management. Part of the crisis mechanism was the implementation of an oil sharing mechanism, demand

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[82] When oil was removed from the agenda in 1974, a foreign policy success for the Americans, the dialogue quickly lost importance. The meetings continued for about 3-4 years but at lower and lower levels of government involvement. Lefeber, Van der Linde, *Op. cit.*, 1987.

[83] Lefeber, Van der Linde, *Op. cit.*, 1987.

[84] Commission of the European Communities (CEC), 2002a, Proposal for a directive of the European Parliament and of the Council concerning the alignment of measures with regard to security of supply for petroleum products. Brussels, 11 September 2002. Priddle, R., "Secure and Sustainable Energy", lecture, The Hague: Clingendael Institute, 7 November 2002, http://www.iea.org/new/speeches/priddle/2002/clingtxt.pdf.

management measures and the establishment of strategic oil reserves of 90 days of internal consumption.

The IEA has developed into an inter-governmental organization, which developed great expertise in energy market research and modelling and has also become an important source of energy data and other information on (future) energy flows. Also, the IEA organised many conferences where energy experts from government, industry and academe meet to discuss developments in oil, gas and electricity markets, the effect of climate change policies on energy demand, energy market regulation and recently also the access of the poor to commercial energy. The consultations in the IEA have become an important channel of information sharing and the co-ordination of policies. The IEA represents a large share of oil demand in the world and has created with its strategic reserves an important policy tool to constrain OPEC in its price ambitions.

The fact that the IEA examines energy markets rather than oil markets is an indication that the work terrain of the IEA has progressed with the development of energy demand. Even though IEA member states are increasingly becoming substantial importers of gas, this change has not been translated in a gas crisis management policy. This may be due to the regional character of the gas markets. In the future it is possible that such a policy would be desirable, particularly if the fears of the establishment of a GASPEC materialise.[85] In this case, however, the developments in the EU will very likely pre-empt IEA policies. Moreover, the probability that IEA would, in gas matters, override EU gas policies is exceedingly small. For the EU, it is important that EU gas crisis management, which must accompany the liberalisation of the European gas market, is consistent with the EU needs of security of gas supply. Nevertheless, it is possible that with the expansion of the international gas (LNG) market, IEA wide co-ordination of crisis management is required.

International Energy Forum

One of the main aims of consumer countries is to create security of supply, while producer countries desire security of demand. These two energy policy priorities have brought producers and consumers increasingly together. Efforts of Venezuela and France in the 1970s and early 1980s to bring producer and consumer countries to the table initially failed. When relations had normalised in the second part of the 1980s, a dialogue became possible. In the past decade, the consumer-producer dialogue has gained importance and has been institutionalised in the International Energy Forum (IEF) with a Secretariat in Riyadh, Saudi Arabia. About 80 countries participate in the bi-annually meetings of the energy ministers. The agenda of the IEF was initially predominantly focussed on oil issues but recently gas and other subjects, such as investments, public-private partnerships, etc, have been included in the agenda. The IEF has become an important channel for co-operation and creating a far better understanding of the vital interests and problems of the participating countries.

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[85] Correljé, A., Van der Linde, C., Westerwoudt, T., *Natural gas in the Netherlands, from Cooperation to Competition?*, Amsterdam/The Hague: Oranje-Nassau Groep/ CIEP, 2003, pp. 202-203.

4.6 Security and military policies

In section 4.4, we already referred to security policy as a close companion of foreign policy. Yet, with regard to energy we have to discuss security policy separately as well. During the Cold war energy producing countries were continuously pressured to belong to one camp or the other and were placed under the protective military umbrella of one of the major powers. The end of the Cold war has not changed the fact that energy is still a vital interest for superpowers and that when energy security is jeopardised military intervention is always a possibility. We already referred to the Rapid deployment Force of the US. The distribution of military bases around the world underpins the credible threat to intervene in case of a calamity that seriously disrupts oil and gas supplies. After 9/11/2001, the US has employed its military forces to intervene in Afghanistan and Iraq. The US has also expanded the number of military bases in the Caspian Sea region and Iraq. The threat to use military force is a strong policy tool to influence relations in the world. The EU has no such ability to defend its vital interests and therefore will have to resort to different policies to defend its interests. The EU traditionally was under the US military umbrella as well, but recently transatlantic relations have changed. Support for US policies is no longer automatic. Yet, the EU has not developed a security policy that can match the security policy of the US or China for that matter. The EU seems to rely on its economic diplomacy only, using the promise of security of demand as a carrot for producing countries. The asymmetry of the available policy tools of the US, EU and China limit the possibilities to make this approach effective. The US and China will not allow the EU to benefit from their costly geopolitical foreign and security policies if the EU does not contribute or is able to retaliate. In that sense competition among consumer countries also extends to effective foreign and security policies to secure supplies. The rift in the transatlantic relations is serious with regard to the security of energy supply. For instance, it is in the EU interest to pacify the situation in Iraq as quickly as possible and begin with the release of Iraq giant oil potential. Yet, the support for the US and UK occupation forces is minimal and has split the EU in opposing camps. The EU has every incentive imaginable, whether they agreed to the intervention or not -it happened-, to favour a return of stability to the Persian Gulf region. Currently, unrest is also materialising among Iraq's neighbouring countries Saudi Arabia and Iran and Turkey, a potential EU member state, is an interested party. The balance between restoring stability and turmoil is a fragile one and the EU has, just like the US and China, a lot to lose if the Persian Gulf slips into chaos. In the short term, from a security of supply point of view, the EU will have to formulate some sort of position on the developments in the Persian Gulf.

4.7 Security of supply and the EU internal energy market

Despite the strength of the political arguments *against* import dependency, it can be observed that large amounts of energy haven been traded internationally, particularly coal and oil, and to a lesser degree natural gas. For types of energy such as coal and oil, for which the transport infrastructure is only moderately *asset specific*, national trade became common practice - albeit often couched in all kinds of specific trade arrangements and regulations. Indeed, the argument for dependency was weakened because ports, ships and refineries etc. could be used to transport and receive coal and oil from every potential supplier. This was, however, less the case in gas and electricity network industries, in which cables and pipelines are specifically constructed for transports from point A to B. If A fails or refuses to provide the gas or electricity to B, the connection becomes useless. As a consequence, the international trade in gas and electricity is considered much more vulnerable. Therefore trade in grid bound types of energy is generally more politicized and requires a great deal of trust and commitment. An additional factor is that, precisely as a consequence of the development of national network supply systems, all countries devel-

oped their own traditional organization and institutional structures, as a function of national characteristics like resource endowments, spatial distribution of activities, and access to technology, political preferences and pressure by interest groups. These specific attributes, in turn, impeded large-scale interconnection and trade between national systems. More recently, European national networks have been increasingly engaged in trading electricity, already before the project of the Internal Energy Market took off, following the publication of the EU Commission's report "The Internal Energy Market" in 1988 (CEC 1988). In case of international gas trade, objectively the same situation prevailed, but here the international transmission network was constructed in a more controlled manner. It was done by a very small number of actors, dominated by the large international oil companies – as main gas producers - in co-ordination with national and local authorities – that could take national circumstance into consideration.

Thus, a great deal of integration - in the sense of cross-border trade - was already achieved before 1988. Initially, this cross-border trade took place under a regime in which the exchanges were undertaken in a controlled manner, strongly co-ordinated by a limited number of public and private actors: *controlled integration*. Yet, towards the end of the 1980s, a tendency became visible in which relatively small amounts of energy were being traded outside the prevailing controlled system. Hence, very gradually, a kind of *market-driven integration* developed. The explicit aims of the EU-initiative in 1988 were to adjust the existing regime in such way that international trade in energy would become subject to competitive market conditions. So, the formerly important role of governments as owners, managers, plus a limited number of private concession holding monopolies, is gradually being ceded to private actors that base their decisions on a commercial logic.

This change has considerable quantitative and qualitative consequences for the international trade in energy and for the (perception of) security of energy supply in the Member States. This process has been developing in a dialectical manner, as a function of: first, the EU Commission's drive to extend the single market to the energy sector; second, the interests and preferences of the Member States, each with its specific configuration of national energy peculiarities and associated interest groups; and, third, 'external' circumstances, that shaped both the perceptions of the several actors involved in the process of integration, as well as the objective conditions under which the process is evolving. It remains to be seen to what extent real convergence – and a degree of trust - will materialise among the Member States, regarding the way security of supply can be achieved as a EU policy.

4.8 The economic impact of supply failures

A particular class of studies seeks to measure and economically evaluate the several security aspects associated with patterns of energy supply and measures of energy security policy.[86] Bohi and Toman translate several types distortions of oil supply into externalities and/or market in-efficiencies and market failures that cause extra costs and in-efficiencies to the economy.[87] Indeed, as they, argue only the identification of externalities and market failure would constitute a justification for government intervention. They distinguish between the direct and indirect costs of oil imports and the costs of energy price volatility. Regarding the consequences of import dependence, direct costs are related with the impact on price levels of the market power of exporting OPEC countries and the potential use of monopsony power of importing countries, while indirect costs involve the trade balance effects on exchange rates and the structural inflation, caused by high oil prices.[88]

Externalities caused by energy price variability are only associated with the costs of short-term adjustments to price shocks, as they assume that long-term consequences are internalized. The main short-term issues at stake in adjustment involve the decline in productivity and sticky wages, the premature obsoleteness of energy intensive capital goods and rigidities in factor prices and allocation. The main externality Bohi and Toman recognize is in the reduced ability of economic actors to adequately undertake the adjustments required, as a consequence of institutional rigidity, lack of information and foresight, high private discount rates in investments in storage capacity, investment in diversification and energy efficient capital goods and public sector regulation rigidities. Yet, the practical problem is to isolate the costs of these externalities from the cost of adjustment per se.[89] While arguing that the consequences of OPEC market power are the main significant import externality to deal with, they refer to a hierarchically structured set of possible measures to be taken: R&D for new technologies, strategic oil storage, and public utility reform to enhance the responsiveness of gas and power markets. They consider taxes to curb energy consumption and oil import reduction measures as less attractive.[90] By and large, it can be concluded that economically oriented studies are geared towards the macro-level effects of energy supply disturbances and abatement measures.

4.9 Conclusion

The impact of a supply disruption can effectively be reduced by the implementation of various policy measures. Although a disruption cannot always be prevented, other policy measures can contain the impact on the economy. Diversification policies are the most commonly used for this purpose based on the premise that a variety of flows usually are not interrupted at the same time. In general, energy system flexibility is a basic requirement for proper crisis management. Any weaknesses in the energy system will come to the fore under pressure and it will limit the ability of the system to absorb a shock. The present concern in consumer countries is that the increased geopolitical risks that governments perceived after 9/11/2001 come at a time when energy markets are being deregulated and re-regulated. The worry is that a disruption will occur before the newly designed energy markets have stabilized. The transition

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[86] See, for example, Bohi, Toman, *Op. cit.*, 1993; Greene, D.L., Jones, D.W., Leiby, P.N., "The Outlook for US Oil Dependence", *Energy Policy*, Vol. 26, no. 1, 1998; Bohi, D.R., Toman, M.A., *The Economics of Energy Security*, Deventer: Kluwer Academic Publishers, 1996; Balke, N.S., Brown, S.P.A., Yücel, M.K., "Oil Price Shocks and the US Economy: Where does the Assymetry Originate?", *Energy Journal*, Vol. 23, no. 3, 2002; Brown, S.P.A, Yücel, M.K. (2002), "Energy Prices and aggregate economic activity: an interpretative survey", *The Quarterly Review of Economics and Finance* 42, pp. 193-208.; Jones, Donald W., Leiby, Paul N, *The Macroeconomic Impacts of Oil Price Shocks: A Review of Literature and Issues*, Energy Division, Oak Ridge National Laboratory, January 5, 1996; Jones, Donald, W., Leiby, Paul N.,Paik, Inja K.,"Oil Price Shocks and the Macroeconomy: What Has Been Learned since 1996," Proceedings of the 25th Annual IAEE International Conference, June 26-29, Aberdeen, Scotland, 2002; Zweiffel, P., Bonomo, S., *'Energy security, coping with multiple risks',* in Energy Economics, vol. 17, no. 3, p.179-183. London: Elsevier Science, 1995.

[87] Bohi, Toman, *Op. cit.*, 1993, 1996.

[88] See also Balke, Brown, Yücel, *Op. cit*., 2002.

[89] Bohi, Toman, *Op. cit.*, 1993, pp. 1102, 1003.

[90] Bohi, Toman, *Op. cit.*, 1996, pp. 122-124.

to competitive electricity and gas markets in Europe (and elsewhere) has created new challenges and uncertainties for investors that temporarily can hamper the robustness of the energy systems. In the transition to and the completion of the internal gas and electricity markets, policies need to be reviewed on their efficiency in the new market circumstances. Security of supply policies also need to be reviewed against the background of the new internal market circumstances and the new geopolitical and economic developments.

5

Two Storylines and the Security of Energy Supply Strategies

5.1 Introduction

In the previous chapters we have shown, based on the IEA World Energy Outlook 2002 (see Annex 4), the growing exposure to security of supply risks for the European Union. We have identified that both oil and gas imports will be increasing in the period up to 2020 and thereafter. The predicted development of demand and supply of oil and gas is based on the *IEA Reference scenario*, which does not include many of the environmental constraints that have been agreed under the Kyoto Protocol or 'any other possible, potential or even likely future policy initiatives'.[91] It is important to be clear that the policy initiatives with regard to CO_2 emission reduction policies, which are under consideration in OECD countries, are covered in the *Alternative Policy scenario*.[92] Total demand and supply for oil and gas in the Alternative Scenario are substantially impacted: "Oil consumption would be reduced by 4.6 mb/d below the Reference Scenario in 2030, gas by 260 bcm and coal by about 150 Mt in 2030."[93] The OECD call on OPEC oil supplies would be reduced with 7% in 2030, while OECD gas demand would be reduced with 12.5%. The decline in demand under the Alternative Scenario is translated in a reduction of imported oil and gas in 2030 because domestic supplies are considered to be less affected. The net natural gas imports world decline from 632 bcm in the Reference Scenario to 512 bcm in the Alternative Scenario. Put differently, imports would be, respectively, 81% or 77% of primary gas demand in the EU, 31% and 23% in the US and Canada and 29% and 22% in Japan, New Zealand and Australia. The implementation of the environmental policies that are presently under consideration, contribute to the reduction of import dependencies in oil and gas of the OECD countries. However, the EU will still substantially have to rely on imported oil and gas supplies, and consequently, be exposed to security of supply risks.

Both IEA scenarios exclude major changes in the make-up of the international political and economic system and, for the purpose of this study, must be considered business-as-usual scenarios in geopolitical and geo-economic terms. In the section 7.3 we will introduce the scenarios or storylines relevant for this study, of which one, *Markets and Institutions*, is closely related to the IEA scenarios.

The substantial shares of oil and gas imports in EU oil and gas demand present a certain risk with regard to security of supply. The exposure to these risks is, however, also increasing because of a concentration in the origin of the imports on but a few exporting countries. Some of these exporting regions have progressively become more politically and economically instable, partly as a result of the negative side-effects of the mineral exporting economy and partly because of geopolitical developments in the region and among the main importing nations. For a detailed description of the current economic and political

[91] IEA, *World Energy Outlook 2002*, p. 38.

[92] IEA, *World Energy Outlook 2002*, Chapter 12.

[93] IEA, *World Energy Outlook 2002*, p. 342.

developments in Russia, the Caspian Sea region and the Persian Gulf we refer to Annex 1. For a detailed description of the geopolitical and economic developments in Asia, particularly China and Japan, we refer to Annex 2.

Based on the analysis of the geopolitical and geo-economic developments in the regions described in the annexes and the analysis in the previous chapters, we will develop 'storylines' of our future environment in this chapter. Combined with the EU interests in security of oil and gas security of supply, these storylines will suggest, when possible, alternative strategies to support EU energy security. We will identify a set of features common to each storyline or environment, which are on the stable intersection of both alternative environments.[94] The core environment is characterized by the following features (in no particular order): the energy needs and the integration of the economies of the EU-25 and possibly EU-30, but also includes the increased oil and gas consumption in the world, the growing imports of oil and gas and the concentration of supplies in a few countries. The strategy to satisfy the interests should at least cover the core environment, while the other components of the alternative environments allow some choice how to deal with the alternative options. The alternative environments also differ in the risk exposure and the risk sharing (such as the IEA's strategic reserves) involved.

The core environment requires the inclusion of the origin and consequences of future disturbances in the supply of oil and gas in the period up to 2020. The storylines will illustrate to what extent the geopolitical stability of oil and/or gas producer countries or regions is a critical factor in future world energy supply. The storylines will also reflect upon the possible strategies of main consuming countries, or areas, that also seek to secure their energy requirements. The storylines are based on existing estimates and trends.[95]

A crucial assumption of the storylines is that both the nature and consequences of supply disturbances, as well as possible instruments to protect against these consequences, will differ according to the context in which these disturbances arise. From this perspective, context refers to both the economic situation, as well as the institutional and geopolitical aspects of relevance for the world energy market.

5.2 Some factors that determine real outcomes compared to storylines

The evolution of future demand for oil and gas is generally accepted to be a function of economic development, in terms of the size and structure the economies and the development of the transport system, energy prices and national/regional characteristics regarding the availability and use of energy. The longer-term development of these related factors is complex and includes the changes in the use of technologies, the way they are embedded and the development of new technologies[96]. Recent history has witnessed quite substantial shifts in those factors and in their qualitative and quantitative impact on energy use.

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[94] Paul Bracken, Geopolitics and Business, Yale School of Management, 26 September 2003, lecture delivered at Groningen: EDI, Gas Strategy Course, 27 September 2003.

[95] IEA *World Energy Outlook 2002,* Paris: OECD/IEA. Shell, *Energy Needs, Choices and Possibilities: Scenarios to 2050,Global Business Environment, Shell International*, 2001; Manders, T., Mulder, M., *Long term Scenarios for Energy Markets*, Paper prepared fro the 26th Annual International Conference of the International Association of Eenrgy Economics, Prague, Czech republic, June 4-7, 2003.

The future supply of oil and gas is also a function of a complex set of factors, such as geological endowments and economic and political developments. These involve geological desk and field research to identify potentially oil or/and gas bearing structures, further exploration activities to secure their location and contents and to determine the costs of production, a process of decision-making regarding their further development, and the construction of production and transport infrastructures.

In practice, the chain of decisions required to engage in these activities and to move forward towards the actual process of producing and marketing the fuels are part of a complex multi-criteria risk analysis, that involve a range of factors. Over the long run, this process leaves substantial discretion as to which hydrocarbon reserves are to be developed first and taken into production. Indeed, the currently known distribution of proven reserves is by no means a precise indication of the future distribution of production capacities, let alone of production volumes[97]. The large share in the proven reserves of the countries around Persian Gulf, for instance, was not proportionally translated into a similar share in production in the period after 1973. Nevertheless, the size of proven reserves is often considered a reliable indictor of the future importance of the worlds' various oil provinces.

A forecast of the size and the location of the future oil and gas production is more complex than the current distribution of proven oil and gas reserves suggests. Without going into too much detail, the number of factors influencing the causal relation between – or even before – knowing the size of proven reserves and actual supply to the market from these resources is significant. To illustrate this point, long-term relationships of regional economic development, structural change in demand by type of fuel and the dynamics of supply (finding, the creation of reserves in the ground, development of production capacity, production) are a function of demand, price outlook, investment climate (which includes political and economic stability), technological development, and the all-encompassing concept of the comparative advantage of regional resource regimes.[98]

Furthermore, the factors that determine demand and supply in the future are dynamic rather than constant. The relevance and strength of the factors are dependent on issues like the market structure, pricing episodes, growth expectations, international (economic) integration, political and economic risk distribution, local geopolitical uncertainties, elements of regional governance, socio-economic and environmental belief systems, and the way in which the global order is constituted by a distribution of world

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96 Darmstadter, J., Dunkerley, J., Alterman, J., *How Industrial Societies Use Energy*, Baltimore/London: John Hopkins University Press, 1997; Schurr, S.H., "Energy Use, Technical Change, and Productive Efficiency: An Economic-Historical Approach"*, Annual Review of Energy*, Vol. 9, 1984: pp. 409-425; Schipper, L., Meyers, S., *Energy Efficiency and Human Activity: Past Trends, Future Prospects*, Cambridge: Cambridge University Press, 1992.

97 BP, *Statistical Review of World Energy*, 2003

98 Adelman. M.A., *The Genie out of the Bottle: World Oil since 1970*, The MIT Press, Cambridge, (Mass.), London England, 1996; Odell, P.R., *Oil and Gas: Crisis and Controversies 1961-2000, Volume 1: Global Issues*, Brentwood, England: Multi Science Publishing Company Ltd., 2001; Odell, P.R., *Oil and Gas: Crisis and Controversies 1961-2000, Volume 2: Europe's Entanglement*, Brentwood, England: Multi Science Publishing Company Ltd., 2002.

power. As we argued in Chapter 3, and as is clearly illustrated by long-standing lessons drawn from the history of world oil and the natural gas industry, the *state of the world* does matter for what is – and will be - happening in the world oil and gas industry.[99]

5.3 Main trends for the storylines

In terms of the definitions presented in Chapter 2, we will focus our analysis on two main paths of development influencing the constitution of the *international political and economic system,* shaped by national, inter- and intra-governmental and non-governmental institutions and organizations. This includes states, (multinational) companies, armed forces, terrorist groups, peace and human rights activists' movements, and environmental organizations. Yet, in this study we will mainly focus on the role of states. We further assumed, regarding the *relationship between security of supply (of the EU) and geopolitics*, that the socio-economic and political context of the system of energy supply has an impact in the degree to which oil or gas can be made available in sufficient quantities and at affordable prices. The two main storylines further build on this assumed relationship between the socio-economic and political order or system, and the occurrence of risks to the continuity of energy supplies in consumer countries. *Risk* is defined as the probability of an event affecting supply and *exposure* can be defined as the vulnerability of a society to such risk. We indicated earlier that increased risk occurs as a result of: a) deliberate policy changes in producing countries or producer country organizations; b) prolonged inadequate investments levels (in production, transportation and processing and distribution capacity and/or maintenance); c) macro-economic instability in producer countries; d) political instability in producer countries and/or regions; e) regulatory instability in consumer countries; f) market failures; and g) government failures. A *geopolitical risk to the security of supply of the EU* arises when a change or breakdown in the international economic and political order, or (part of the) system takes place. This may involve the exclusion or discrimination of states, the objective of autarky, political boycotts, failed states and occurrence of terrorism and war, resulting in absolute or relative scarcity of oil and gas supply.

We will be using two storylines that build on these extremes: on the one hand, a continuation and intensification of internationalisation of markets (globalisation) and the continued co-operation in the international political and economic institutions; and, on the other hand, the break-up of the world in integrated political and economic blocks with satellite regions that compete for markets and resources with other blocks. The former case is designated ***Market and Institutions.*** A key factor in this storyline is the assumption that the evolution of the multilateral system will continue to govern international relations, although it is possible that a state is dominant. The *Markets and Institutions* storyline is reminiscent of the regime building of Joseph Nye.[100] In the second storyline, named ***Regions and Empires***, the multilateral system will become trivial compared to the inter-block interests. This storyline refers to what is known in the literature as 'regionalism' and the empires refer to a neo-realist state-security centred competition for power type of development.[101] Alliances among blocks will determine world politics and stability in this situation.

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[99] Clarke, J.G., *The Political Economy of World Energy: A Twentieth Century Perspective*, Wheatsheaf: Harvester, 1990.

[100] Nye, J.S. jr., *Bound to lead: the changing nature of American power*, New York: Basic Books, 1990.

[101] Waltz, K.N., *Theory of International Politics*, Princeton: Princeton University Press, 1979.

In essence, the two storylines presented here differ in a number of important respects. First, a key difference focuses on the extent to which *states* or *markets* are seen as the main device for coordinating industrial – and state - behaviour in respect of supply and demand in the oil and gas sector. Of course, a mixed system in which a government coordinates its (security) interests with private companies is also possible. But this will be a local variation within a wider, global, context in which either 'the market' or the 'state' is the dominant coordinating devices of the economy. A second distinction lies in the geographical spheres that are encompassed by these coordinating devices. These spheres may range from the whole of the global system, to inclusive groups of states plus singular states, and a series of unconnected areas with different degrees of statehood. A third dimension is the degree to which environmental aspects are internalised in policy-making and in the institutional set-up of the systems of governance. These development modalities will be sketched in this chapter. Of course, it is recognized that the world is composed of separate regions with their own economic structures and cultures and dynamism. Nevertheless, it is argued that differences in only a few crucial characteristics of the world order will be sufficient to delineate significantly different systems of oil and gas use and supply[102].

The emphasis in this chapter is on the long term development of world and EU energy supply policy. Next, the resilience of these policies in the event of an *energy crisis* is examined. In Chapter 2, the term *energy crisis* was defined as a short term disruption of supplies (as a result of domestic economic or political unrest in producer countries; export restrictions or boycott and import restrictions or embargo on energy imports) and/or sudden price increases, with significant (short and/or long term) economic effects.[103]

To set the stage, earlier, some of the main trends in the development in oil and gas supply in the next 20 years were addressed. Steps were also taken to identify a number of geopolitical factors that are of significant importance for the evolution of supply over the longer term. Many of these factors emerge from the assumption that, first, consumption will increase significantly in a range of transition and developing countries; and second, that a significant proportion of today's production capacity is in maturing oil provinces, like the North Sea and North America. This suggests that new oil and gas reserves will have to be developed into producing fields. The lion's share of these new reserves and potential production are located in the Persian Gulf, Russia, the Caspian Sea region and West Africa. Some countries in Latin America and parts of North America also comprise significant undeveloped reserves (see table 3.1).

The accessibility of these areas and the willingness of the oil industry to credibly invest in these regions is, however, a function of the political and social stability of the countries and the economics of the projects. In part, this stability will be a function of an autonomous socio-political evolution and the occurrence of economic growth and structural change. It is forecast that by 2020, half of all world oil supplies

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[102] See also Odell, P.R., "The Global Oil Industry: The Location of Production – Middle East Domination or Regionalization", *Regional Studies*, Vol. 31, 3, pp. 311-322, 1997.

[103] Yet, we also speak of an *energy crisis* when supplies are suddenly greatly expanded and results in such a dramatic price decline that the continuity of the national energy systems (in consumer countries that rely on companies supplying the market but also in producer countries that cannot produce at such a low price or see their export and government income drop below sustainable levels) is at stake. See Chapter 2.

will originate in countries that we currently believe to have a high risk of internal instability[104]. In some cases, internal and external stability are closely linked.

Moreover, the presence of energy resources and their exploitation potential may, in itself, influence the degree of stability. Traditionally, states (and non-state actors) have assigned large significance to the control over key natural and energy resources. It is thus believed that conflicts between states over the control of oil and gas resources will emerge more often, as a consequence of the growth of imported energy consumption and the increasing dependence on a limited number of suppliers. Internal conflicts over oil and gas exploitation may arise in countries where this is the main source of income and has not brought the expected level of welfare for the population– a phenomenon that is commonly known as the *resource curse*. Disputes over the control of oil and gas resources are often present as an element in complex conflicts involving ethnic and religious hostility, economic struggle and political competition.

In addition, the energy policies of the main consuming states, determined to achieve energy security, are bound to interact one way or another. These states may be competing for secure supplies of oil and gas. Traditionally, a distinction is made between those states that relied on the market and those that employed a more 'strategic' approach to its energy security[105]. The position taken by states generally depended on their belief in the ability of the market to produce security of supply. This faith often was a function of their specific position in the market, as a producer, a consumer, or as the home-country of significant exporting industries. Also the relative strength of their energy companies on the international market mattered in the governments' approach to energy security.[106] To be sure, a free-market position in one segment of the (energy) market did not automatically imply a principal choice for such a position in other sub-markets, or a principal rejection of the dominance of large international oil companies.

The objective to exploit oil and gas resources prompts co-operation as well as conflicts between the different parties involved. This may include the states directly involved, local groups**,** (groups of) OECD countries, in their capacity as oil and gas consumers and home countries of most of the oil companies, international organizations, and non-state actors, like the oil industry and financial groups, local criminal groups, radical (Islamic) groups, and Non-Governmental Organisations (NGOs). Depending on the 'state of the world', conflicts of interest between (parts of) countries are mediated, fought in wars or resolved in international meetings.

In addition to these interest-group related arguments, market circumstances also influence the strategic options open to governments. If oil is traded widely on international markets – as one great pool - and when prices are a function of supply and demand, there is no need to secure access to equity oil other than through the market. The amount of oil supplied to the world market by international and national oil companies is sufficient and the main driver of the international trade in oil and gas. This view is supported by Marcel and Mitchell, arguing that: "the crucial requisite for energy security is to get the oil on

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104 CSIS, *The Geopolitics of Energy into the 21st Century*, 2000, p. xvii.

105 Andrews-Speed, Liao, Dannreuther, *Op. cit.*, 2002, p. 43.

106 For instance, Chinese analysts strongly belief that the US foreign policy is predominantly influenced by oil interests and that the US is flowing a strategic approach.

the market and to prevent any disruptions of supply. In terms of the energy security of importing states, it is irrelevant who sells the oil and who buys it. Oil is a global commodity and the price is not set in Baghdad."[107] Over the past 20 years, most consumer countries - supported by the IMF and the World Bank – generally have preferred international trade in oil, reducing state control over oil and gas supply.[108] The impact on energy trade flows of governments that have a strategic approach to the market, like China, is not very large and their approach does not substantially change the liquidity of the oil market.

If a situation would develop, however, in which substantial amounts of oil would not be traded on the open market anymore, but, instead, were channeled to the consumers through bilateral (government-to-government or state-company to government or state company) contracts, market liquidity could decline seriously. Such a situation could occur when governments that apply a more strategic approach to energy markets, like China[109], begin to dominate trade and prompt other governments to adopt a similar approach and cause a snowball-effect. Once a number of vital countries switch to a strategic approach, other governments could be provoked to do the same.[110] Such a situation may be the result of a lack of effective consultation between producers and consumers, causing pressures upon international oil companies, to favour specific markets and currencies.[111]

If the market, at first, and then a strategic approach to the market would fail to provide the required level of energy security, it is possible that consumer governments would resort to taking physical control of the resources for at least a certain amount of time, in order to create the conditions for the industry to succeed. In case of a government favouring a market approach, it would want to introduce the conditions for international oil companies to gain access to the energy resources. In case of a government favouring the strategic approach, it would want to introduce conditions for its state companies to gain access to the resources. That these situations are not far-fetched can be illustrated from the establishment in the

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[107] Marcel, Mitchell, *Op. cit.*, 2003, p. 1.

[108] In the gas industry, this development is not as common as a in the oil industry.

[109] In the *People's Daily,* Thursday 14 November 2002, China's oil strategy in the 21st century was discussed to cover the following 10 aspects: to diversify the sources of China's oil import; co-develop oil and gas wells with and in other countries; set up the national oil reserve and security guarantee mechanism; initiate the national oil foundation to construct a platform for oil finances and futures; re-start the National Energy Commission as the specific department to deal with oil security affairs; cut out some unreliable marine oil transportation lines; prepare four strategic oil preserves in northwest China; encourage a frugal and efficient oil consumption; organize a couple of very large oil corporations; and restructure China's energy consumption regime to reduce the dependence on oil.

[110] This policy of a single dedicated destination of oil produced by Chinese companies is according to Andrews-Speed et al. promoted by the Chinese government. According to Chinese energy policy documents, drafted in the mid-1990's, overseas investment projects by Sinopec, CNPC and CNOOC should, in the eyes of the government, exclusively serve the Chinese domestic oil market and not produce for world oil markets. The article in the People's Daily does not counter the view that China has a strategic approach.

[111] The challenge to the dollar as the preferred currency for energy trade has been a recent topic of discussion. Even the Russian President Putin recently indicated that trade in Euros could be an option. The US has benefited from the key role of the dollar in the international monetary system because they did not suffer from currency induced fluctuations in their energy prices. See also Annex 3.

1980s of the US Rapid Deployment Force that was specifically designed to remedy an oil supply disruption in the Persian Gulf. In the present market oriented approach, most consumer states favour co-operation among consumer nations, even though the stronger states will want maintain the military capability to defend their national interests, hidden behind the veil of a market-oriented approach.

5.4 Storylines for a distant future

The detailed accounts of recent developments in the main producer and consumer countries provide us with many possible development paths for production capacity and consumption levels for oil and gas. As noted earlier, the two storylines that we have proposed, *Markets and Institutions* and *Regions and Empires* are partly derived from a number of more or less consistent scenarios that have been developed by the United Nations,[112] the IPCC,[113] the Dutch CPB[114] and others, which also reflect to some extent the neo-realist state-security centred competition for power and the regime building concepts of Joseph Nye. Our storylines, however, reflect the experiences of the post 9/11/2001 world and more recent insights in respect of power-relations in this world like the subsequent change in the US foreign and security policy that led to the War on Terrorism. The war on terrorism currently underway has resulted in US military interventions in Afghanistan and Iraq. Moreover, we have further built our two storylines on our own insights derived from the case-studies that are presented in Annex 1 and 2.

The reason why we adapted the existing scenarios into our own storylines is that the 'former' generation scenarios, which are predominantly of the *Market and Institutions* type, could never have accommodated the consequences of the attack on the World Trade Centre and the Pentagon and the subsequent US perception of the world. Indeed, these events would have been placed among the *blackest* scenarios possible – with a negligible probability. Whilst the 9/11/2001 attacks changed the US perception of the threats to homeland security and how to remedy its security threats, the 9/11/2001 attacks alone were not the only reason for this change. In fact, signals were getting stronger, in the 1990's and early 2000, that the US was unhappy with the manner in which the multilateral system was developing (for example the trade talks in Seattle, the international criminal court and the Kyoto Treaty) and with the continued obstruction on the part of some of the Security Council permanent members to deal with Iraq (smart sanctions discussion in June 2001). The US approach has since shifted from multilateralism to strategic uni-or bilateralism that serves the security interests of the US rather than the international political and economic system. Already a schism has emerged between the US and the EU member states with respect to the perception of the policy-spaces open to them[115].

Within the logic of our two storylines, our conclusion is that the US has shifted from a *Markets and Institutions* approach to a *Regions and Empires* approach of the world[116]. Conversely the EU is still firm-

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[112] United Nations, *Global Environmental Outlook 3*, *Past, present and future*¸ London: Earthscan Publications, 2002.

[113] IPCC, *Emissions Scenarios*, Cambridge: Cambridge University Press, 2000

[114] Manders, Mulder, *Op. cit.*, 2003.

[115] See also *The Breaking of Nations: Order and Chaos in the Twenty-first Century*. Robert Cooper. London: Atlantic Books, 2003.

[116] See also: Ignatieff, Michael. *Empire Lite: Nation-Building in Bosnia, Kosovo and Afghanistan*. Penguin, 2003;

ly embedded in the *Markets and Institutions* approach. The EU is so deeply committed to this approach because the unfinished EU integration process substantially overlaps with this approach. In our view, a paradigm shift from *Markets and Institutions* to *Regions and Empires* would require the EU to emphasise political integration, also including foreign and security policy with its adjacent backyards, rather than purely economic integration. Such a shift is particularly badly timed for the EU, because it has to absorb 10 new member states and support a great deal of economic institution building. Political integration seems much more difficult to achieve, given radically differing views on a multitude issues. Such a shift towards a *Regions and Empires*, therefore, would radically alter the nature of the European integration process, or even jeopardise its further progress.

Russia and China seem to be vacillating between the two approaches. They still lack the institutional development, the stability and the market-based democracy and are struggling to become an integral part of the *Markets and Institutions* approach, while the *Regions and Empires* approach is still (institutionally) close to their previous approach to world affairs. If Russia and China decide to go along with the US paradigm shift, provoked or unprovoked, multilateralism could loose its impact and reach. Obviously, this choice will be a function of the perceived balance of political and economic gains and losses.

The previous set of scenarios essentially drew the demarcation lines along the concepts of economic globalism *versus* economic regionalism and of social and environmental considerations *versus* the 'market'. In our approach, the dividing lines are based on the concept of strategic uni- and bilateralism *versus* multilateralism. The recent US approach of unilateral political regionalism indicates that the US acts as if it is able to move without the need for secure prior consent in (part of) the institutionalised global system and its institutions, like the UN.

Of course, given the absence of the Soviet Union and the yet unrealised political power of China, it remains to be seen to what extent this position can be maintained for a longer period of time and whether it may prove a new development in the international political and economic system towards a new era of *regionalism*, which is taken as a point of departure in the *Regions and Empires* storyline.

Despite our hesitation to declare the inevitable arrival of a new paradigm shift, it is still unclear, however, whether and when the current situation will re-evolve into one in which the integrated 'world market' will become the main point of reference again. As will become clear, both perspectives diverge significantly in the sense that the current perspective of regionalism excludes significant parts of the world market from the world system, while the *Markets and Institutions* perspective potentially embraces all countries of the world, but excludes those that do not adhere to the rules of the game. The place in the world system of certain Islamic countries or powerful groups within certain countries, that have declared their political-religious course incompatible with the required type of integration in the world system, is fragile. In many countries there is a certain degree of resistance to deeper integration in the world system, which is seen as a structure dominated by the US and its views on the world system, instead of a truly global system. The lack of political rights and stunted social-economic progress in many of the countries in the Middle East has created wide-felt dissatisfaction with the ruling classes and the international political and economic system. Further integration in the world economy may hold, in their opinion, little benefit to the poor and lower middle classes in these countries. In their view, oil exports did not bring the expected rewards in socio-economic and political development. Also in Latin America, for

example in Bolivia, the local benefits of production for the international market, in this case LNG, are seriously questioned. The Middle East is therefore not an exception in its reluctance to embrace globalisation. But the specific combination of the socio-economic situation of a large part of the population and the political activities of certain more radical Islamic groups, make this development more serious. Globalisation, of course, also meets opposition in the OECD countries, where anti-globalists make themselves heard at every international meeting of the heads of state.

The American approach towards the international political and economic system also meets increasing opposition. The US approach of Iran and Iraq in the 1990s was by no means fully supported by the EU, Russia and China. The estrangement in approach was further emphasized after the 9/11/2001 attack and the way the US fights terrorism. The fact that the EU and other countries have refused to unconditionally back the US campaign against the so called *axis of evil* (Iran, Iraq and North Korea) has brought about a further accentuation of the differences in aspiration of the US as an empire, and the ambitions of the remainder of the OECD and Non-OECD world as the hangers on. For the moment, there appears to be an increased uncertainty whether or not the 'empire' US will also act in the interests of the 'regions' that (want to or used to) belong to it. The political and economic cohesion of the OECD countries seems to have weakened subsequently, also as a result of the failure to prove the presence of weapons of mass destruction and the weak US policy in Iraq.

In the current situation, the *War on Terrorism* poses strategic limitations on the movement of goods, people and investments – or is causing a lack of trust, required to move – and inhibits the economic development and integration of countries and regions into the world market. Therefore, a situation will persist in which peripheral countries will – at best – maintain a position of some importance as a supplier of raw materials and natural resources, such as oil and gas, but nothing more. Not much additional interest in their development as a 'market' - and thus their socio-political emancipation - seems to be forthcoming, or even demanded. More generally, a lack of confidence in the continued expansion of markets for the goods produced will most likely depress investments in economic development on a wider scale, both in the OECD world, as well as in the non-OECD countries. Time will tell to what extent this delay in world economic development will affect the expected growth of the economies of crucial future 'blocks' in the world economy, Russia and central Europe, China, Central America and India, remains an empirical question.

That said the question as to what extent the current situation may be a direct consequence of the approach of the current presidency of the US seems legitimate. Nevertheless, we must remember that with regard to the Middle East, the approach precedes the attack of 9/11/2001. The lack of capacity to bring about societal modernization in many of the Islamic countries may have its mirror image in the difficulties of the US society to revise its inward-oriented perspective. As a result, the Islamic countries have not been able to embark on a path of modernisation, compatible with a more liberal, modern, and secular outlook on the world. To be sure, as a counter movement to the Bush administration, this counterbalancing development should not be discarded. Therefore, it is prudent to consider at least two main story lines for the medium term development of the international political and economic system, namely *Regions and Empires* and *Markets and Institutions*, with possible alternatives within these storylines. One such alternative is within the *Markets and Institutions* approach if the Kyoto concerns prevail.

5.4.1 Storyline I: Regions and Empires

The *Regions and Empires* storyline bears resemblance to the Security First (UN), Transatlantic Market (CPB) scenarios, for example. It involves, essentially, the social, cultural and economic separation of world regions and countries from each other, on the basis of ideology, religion, and political arguments. Political and military or strategic uni- and bilateralism and regionalism, divide the world up into US, EU and Asian spheres of influence. National and international security concerns and conflicts impede international economic integration, through the control of activities and flows of goods, persons and capital. The absence of world markets for strategic goods further stimulates the establishment of bilateral relationships and treaties, thus reinforcing the formation of exclusive backyards.

Although the market may dominate within (certain) areas, like the production of manufacturing goods and some raw materials, there will be a different world market for energy. In particular, the international oil market will become more regionalised again, although trade flows to various blocks remain possible. Gas, of course, is still a regional market. Oil and gas exporting countries that are part of an 'empire' will predominantly trade within that regional block, with only minor flows going elsewhere. Weak oil and gas producing countries that are not automatically or immediately part of an 'empire' or regional market become contested among the competing 'empires' that need to satisfy their energy needs. In order to protect themselves from outside pressure or attack, these oil and gas producing countries will attempt to obtain a variety of weapons of mass destruction and long range delivery systems. Lacking international legitimacy, because countries refuse to participate or try to dominate their behaviour, international institutions, such as the UN, WTO, IMF, IEA, OPEC and the EU, are, in general, weak. These developments lead to *short termism,* local political instability, social tensions, and possibly even terrorism. Conflicts over natural resources are more likely emerge. It also induces the externalisation of environmental stress, NIMBY (not-in-my-backyard) and international (drug) crime and rogue states in the periphery.

To be sure, the lack of collective interests in the existing international organizations may eventually facilitate the recourse on military intervention by dominant states. In response, countries that have the financial means and political ambition to withstand such an intervention, embark on a 'poor men's' military built-up, involving chemical and nuclear weapons. This, of course, invites preventive strikes by the dominant powers. Patterns of preferential trade relationships and possibly competition over FDI in the more stable areas will develop as a result of regionalism and 'backyards', and reinforce these intra-block links relative to links with entities outside the blocks.

In this respect, a fundamental discussion is the question to what extent the US dollar remains the world's central currency, or whether competition will arise between the Euro, the dollar and one of the Asian currencies as a means of payment for oil and gas supplies. Indeed, regionalisation may support a development in which substantial shares of the world trade in oil and gas will be paid for in Euros, thus reducing the value of the dollar *vis a vis* the Euro in the transition period (see Annex 3). Such a development could be an additional incentive for regionalism because a significant fall in the value of the dollar could lead to trade measures on the part of the US trading partners. More specifically, the trade in gas between the EU and Russia and Algeria would be a likely candidate for a conversion to Euro-denominated trade. In the case of Russia, this conversion to the Euro would assist deeper economic integration with the EU and allow the central bank to reduce currency risks.

Europe

In Europe, the *Regions and Empires* storyline will allow for a moderate expansion towards an unstable Eastern Europe. Economic integration within the EU continues at a slow pace, because most of the efforts have to go to political and security integration. The process of building EU institutions and integrating markets is difficult to complete and national, regional and sector tensions may re-emerge. Increasingly economic integration is poised against protectionism and social issues. Political discussions will arise around the dependency in specific areas, like the nuclear option in energy policy and food supply policy. Europe will have difficulties to determine steady EU policy lines with respect to international relations with the US, Russia and other regions, as a consequence of the diverging interests and traditions among the main European Member states. The absence of a single point of reference will also lead to difficulties in respect of the completion of a single market in energy and in the development of a European security of energy supply policy. Member States, thus, will be tempted to fall back on their traditional approaches, involving nuclear energy, the use of indigenous coal and gas resources, and on limitations on the export of their (energy) resources and stocks. The integration of the EU-wide electricity market will disappear rapidly when national capacities are increased. The large member states of the EU will individually attempt to secure their own 'backyards' for energy supplies, with Norway, Russia, Algeria, Iran and Iraq. The EU would remain a price-taker in energy. The weakness of the international institutions, such as the IEA, and the lack of solidarity among the IEA member states increases the risk and exposure to a disruption in oil and gas supplies and compels the EU member states to increase the national strategic reserves in oil and gas above the present level.

US

In the US, political unilateralism will prevail with respect to its current partners. If these partners are not explicitly *with* the US, they become outsiders to the US-dominated system. There will be a drive to create a *backyard* to supply oil, LNG and other strategic goods. The US will try to obtain a closer relationship, through FDI and influencing regulatory frameworks, with nearby suppliers, such as Canada, Mexico and Venezuela. With regard to other suppliers, elsewhere, this may take the form of an inclination to stabilize the relevant regions, including the Middle East and possibly in West Africa and Latin America, if needed. Thus, energy policy will be increasingly linked up with defense policy and foreign affairs. With regard to Russia, the US will try to prevent a strategic alliance of Russia with the EU to come about because the US needs incremental energy supplies from Russia to balance its needs from different sources. Also, a strong alliance between Russia and the EU could create in the longer term a strong contender for dominance. The Russian economy also becomes increasingly important for American products.

It will remain a question whether the US will embark on a policy that fosters energy conservation and the use of nuclear energy and coal to gain a greater independence from imported hydrocarbon fuels until new energy technologies, such as hydrogen and other alternative fuels, are commercially viable.

Russia

In a world of *Regions and Empires*, Russia will prefer to reinstate its dominance over the CIS countries, particularly the countries around the Caspian Sea, because the present prevailing liberal internationalist approach is no longer viable. The re-orientation on the countries in Central Asia will be initially based on the building of alliances and strengthening economic relations, but the use of military force is also

possible. The Russian government is assisted in its empire building among the CIS countries by the presence of the gas network of Gazprom. The Caspian Sea resources are mainly channeled through the Russian oil and gas transport system, but new outlets, also for Russian oil, are created to reach the Asian markets. The Northwest and Central European market, however, continues to be an important outlet for Russian gas and strategic alliances with individual member states of the EU are concluded to secure demand for gas. Germany and Russia jointly stabilise Byelorussia and the Ukraine.

With respect to oil, Russia uses its oil trade to secure bilateral ties with the US, the EU and Asian countries. In such a situation, Russia may be in a position to boost the future development of Caspian resources and the resources in East Siberia. Such a development could bring Russia in direct competition with the Persian Gulf oil producing countries. Russia will be a good position to become a substantial and alternative supplier to Persian Gulf oil, particularly when it has achieved outlets for its oil and gas in Asia, to supply Japan, China and the US Pacific coast.

The Persian Gulf

In a *Regions and Empires* world, the Persian Gulf becomes a contested region among the worlds dominant regional powers, such as the US, EU, China and Japan. Depending on the ability to amass weapons of mass destruction on the part of the Persian Gulf countries, none of the global blocks are able to fully dominate and to pacify the area. The energy interests of the 'empires' greatly influence the political and economic policy space of the Persian Gulf governments. International disputes over oil and gas production and transport dominate regional relations. International problems around the continuing conflict between Israel and the Palestinians also continue to destabilize the region. Internal unrest, caused by tensions between rulers and dissident social groups, fiscal crises associated with the distribution of oil and gas revenues, regional water disputes, and religious disputes further underline the region's character as a hot-spot area. Depending on the balance of power within and among the region's main countries, Saudi Arabia, Iran and Iraq, the region as such could be more or less stable – but could also slip into complete turmoil. In case of fragile stability, the internal economic problems will determine the volume of the oil and gas flows. Spending needs will be an incentive for increased flows but the required investments to increase exports might not be forthcoming. In that case, FDI will be necessary to create sufficient production and export capacity. In case of turmoil, oil and gas flows become less certain, while FDI will avoid the risk being taken. Depending on the gap between demand and supply for Persian Gulf oil and gas, dominant powers could decide to intervene with military means to secure their supplies.

The lack of international cohesion and the enduring weakness of international organizations, allows only a minor role for OPEC in its present form in managing oil flows to the market. The OPEC that we know today will be reduced to the equivalent of the OAPEC (Organisation of Arab Petroleum Exporting Countries), representing mainly Persian Gulf producers, because Indonesia and Venezuela will leave the organisation. Indonesia because it has ceased exporting oil and Venezuela because it has become part of the US region. Also, it is possible that Nigeria, Algeria and Libya also have decided to leave the organisation in order to safeguard their interests in the US and EU markets for gas. Depending on the production from other regions, the Persian Gulf producers will be swing producers. The oil producers simply act as price takers, dependent on what the market yields.

In a relatively stable Middle East, a system may re-emerge in which bilateral contracts are concluded between the national oil companies and consumer countries, like the US, EU countries and in Asia, in which international oil companies are allowed to support investment in additional low-cost oil and gas production capacity. In an instable Middle East, the investment risks will be too high for international oil companies, or other third parties, and very little capacity additions will be forthcoming in the area.

Africa

Given the declining oil production in the present OECD countries and the uncertainty about the stability of the Persian Gulf, a growing need for African oil and gas supplies could be the result.

North African gas and oil producing countries, like Algeria, Libya and Egypt, have the potential to become main suppliers to Europe, based on their transport advantage. Gas may be supplied through pipelines to Italy and Spain, but also LNG will find its way to the European market. Oil will be supplied with tankers. It remains to be seen, however, whether political and social stability will be preserved to the extent that these countries are considered stable enough to invest in. This stability will be a function of local economic and political developments, including the relation with the EU and the legitimacy of these countries' governments, and the more general evolution of the role of the Islam as a driving factor behind the governance in the region.

The role of West Africa is also ambivalent. The presence of large hydrocarbon reserves may provide the basis for an enhanced integration into the world economy. This, however, will imply a continued dominance of the traditional elite; a situation that may give rise to prolonged civil discontent, instable governments and a weak climate for investments in additional production and export capacity. A situation that is comparable to the current situation in Nigeria. Under the *Regions and Empires* storyline, this instability may provoke attempts of the US and its allies to at least protect and pacify the oil and gas producing areas, through development aid and military force. This, in response, may raise tension between the US and EU-countries, like France, that see their traditional interests jeopardized.

Latin America

Under the *Regions and Empires* storyline, some Latin American countries could become further integrated with the US economy, such as Venezuela, either with the expansion of NAFTA or the establishment of the Free Trade Agreement of the Americas (FTA). Yet many countries in Latin America will continue to struggle with political difficulties and failing systems of governance, not only related with drug trade. The more recent instabilities in some of the continent's larger countries, Venezuela and Argentina, illustrate the continued lack of stability and the weak climate for investments. The current political difficulties to develop the gas-exports in Bolivia could easily continue and result in less secure energy supplies than anticipated. Given the traditional complicated relationship between the US and many Latin American countries, the role as the natural backyard for the US will remain limited. Indeed, the US will never be allowed to actively play a stabilizing role in the area, particularly in the current MERCOSUR region. This implies that parts of Latin America may become further excluded from the main world regions.

Asia

In a *Regions and Empires* world, competition between China and Japan and also India will be the driving force of Asia's regional relations and will create political and economic instability in the region. The growing need to import oil and gas among most of the Asian countries will promote intensified competition in the Persian Gulf and the Caspian Sea region rather than stimulate energy co-operation. The growing dependence on imported oil and gas and the long maritime trading routes for oil and gas leads to a build-up of the naval forces in the large Asian countries, such as India, China and Japan. Securing the oil and gas maritime trade routes will determine the inter-Asian relations to a major extent. For India, the oil and gas resources in the Caspian Sea region and the Persian Gulf will be very important. Japan and China are also competing for Russian oil and gas supplies. Such competition further affirms the strong position of Russia on the world energy markets. To be sure, when the Caspian Sea energy resources are brought under the umbrella of Russia, the command of energy security in Asia will be difficult to obtain. The inter-regional competition weakens the economy of the countries and the lack of markets for their export goods further aggravates the economic problems. The ability of certain countries, such as China, Japan and India, to compete for dominance in the Persian Gulf is small and a strategic alliance with the US or Russia seems like the best option to secure supplies.

5.4.2 Storyline II: Markets and Institutions

The *Markets and Institutions* story line bears a resemblance to the scenarios *Policy First* and *Markets First* (UN), *Global Economy* (CPB). It involves, essentially, a continued social, cultural and economic integration of world regions and countries. Ideology, religion, and political conflicts continue to occur at the international, the national or regional level, but effective international and regional institutions (UN, EU) manage to deal with most of these conflicts. A further liberalisation of markets allows the flow of goods, persons and capital to grow. These flows are coordinated by 'market forces', and facilitated by strong economic institutions, including the WTO, the IEA, OPEC, the IMF, and regional free trade organizations such as EU, NAFTA, MERCOSUR, SADC.

The improved economic cooperation between nations and international institutions supports economic development on a wide scale and under balanced market forces. There is a limited abatement of economic, social and environmental stress by moderately effective international institutions and economic and political treaties. Collective pressures for good governance, including financial institutions, manage to establish increasingly sound governments all over the world. Potentially destabilizing local issues are neutralized through international peace-keeping and development cooperation, thus reducing the impact of local political instability, social tensions, terrorism and international crime, even in the periphery.

Yet, tensions may arise because of costs of environmental policies. In this respect there is a clear distinction between a widely supported "Kyoto approach" and a "Non-Kyoto" world, in which the NIMBY ('not in my backyard') phenomenon is powerful. Under the Kyoto variation there is a much more effective abatement of economic, social and environmental stress. NGOs and Civil Society play a key role in balancing market forces and improving corporate responsibility. Environmental and equity issues will become embedded in local economic and social systems. Economic cooperation between nations is based on civil and corporate involvement.

Europe

In a *Markets and Institutions* world Europe can realise an effective expansion towards an increasingly stable Eastern Europe, the Balkans and Russia. Turkey has become a member of the EU and Russia has joined Norway in the EFTA. The precondition for Russia's entry in the EFTA was political and economic stability in Belarus and the Ukraine. These countries were offered a special relationship that paves the way for membership in the future. Economic integration progresses at a solid pace. Emerging tensions over governance issues in agriculture, transport, natural resources and the energy sectors are solved within the framework of the EU institutions and its economic and social policies and the Energy Charter. Effective institutions for foreign and security policies deal with international conflicts and the EU operates as an international block in the international organizations, UN, WB, IMF, WTO and the IEA fortifying multilateralism.

Under the Kyoto variant, there is an extension of environmental quality towards Eastern Europe, through a redistribution of agriculture, nature and industrial activities. Moreover, cooperation in energy (conservation) policy and a distribution of power generation gradually start to alter the patterns of energy demand and supply in the entire European region.

US

The US actively participates in the following international organizations: UN, WB, IMF, WTO and the IEA. It trades worldwide. A *back-yard* approach to supply oil, gas and other strategic goods takes the form of NAFTA, associated with MERCOSUR. The US participates and leads, alongside other countries, in international campaigns to restore peace and good governance in instable regions, including the Middle East and Africa. Energy policy, as such, increasingly is a mixture of free-trade and environmental policy. The debate continues as to whether the US will embark on a policy that fosters energy conservation and the use of nuclear energy to gain a greater independence from imported hydrocarbon fuels, under a Kyoto approach, or whether it continues to expand its use of energy and will actively embark on a policy to introduce more sustainable energies in the energy mix to manage its import dependency.

Russia

In a world of *Markets and Institutions*, the liberal internationalist route will without doubt prevail. Consequently, Russia keeps from politically reinstating its dominance in the Eurasian region and the CEA region, apart from the building of alliances and economic relations. Consequently parts of this region remain in the hands of local groups and a sequence of varying governments, without a real – or very slow - consolidation of an effective institutional framework.

Gazprom is dismantled as a state monopoly through which the Russian government could influence CIS countries. This initially renders the development of new gas fields and the associated transport infrastructure a difficult and slow process, but the acceptance of FDI (and foreign equity ownership) in gas exploitation and pipelines resolves the initial investment gap. As a result, the supply of additional volumes of gas to Europe evolves only slowly and Russia must accept that other producers from the Middle East begin to encroach on her European market share through LNG supply.

Russia develops into a major oil supplier in the world oil market and international oil companies export Russian oil to the US, the EU and the Asian countries. International oil companies that produce and

export Russian oil create sufficient spare capacity, to share in the task of stabilising the international oil market together with Saudi Arabia and perhaps some of the other Persian Gulf producers. Despite a reduction of the direct role of the Russian state, agreements between the industry and the state allow for the adjustment of oil and gas supply, to achieve prices, at a commonly accepted level. So, cooperation in OPEC, in the IEA and in the International Energy Forum assures an effective management of the oil market, compensating for the occasional shortfall of production elsewhere (Middle East, Africa and even Latin America). Occasional difficulties in the Caspian Sea region that affect the flows from oil and gas can be compensated elsewhere and do not disturb the stability of the oil and gas markets. Particularly because Russia has accomplished to create a variety of outlets for its oil and gas: in Asia, to supply Japan, China and the US Pacific coast and in the European north and south to supply Europe and the US east coast.

The Persian Gulf

In the *Markets and Institutions* storyline economies, the real sharp controversies that create the current instabilities in the Persian Gulf economies may be removed, by and large. Less radical and economic reform-minded governments and economic growth reduce the role of the Islam as a driving factor behind governance in the region. A more liberal, business-like approach might be taken, that renders the area interesting for investors in energy production.

Alternatively, the internal unrest may remain dominant, caused by tensions and recurring disputes between rulers, religious and, social groups and tribes over the distribution of oil revenues. International disputes over oil and gas production and maritime transport are being addressed by the international organizations, with a varying rate of success. The region's main countries, Saudi Arabia, Iran and Iraq, have embarked on a process of economic reforms and political modernization but there remains a large risk of returning to instability, depending on the strength of the conservative Islamic forces and the success of social/economic reform.

Under the *Markets and Institutions* storyline, international cohesion and the strength of international organizations, gives OPEC, in conjunction with the international oil companies, an important role in managing oil flows to the market. It is possible that the OPEC membership has been reduced because some of the smaller producing countries cannot actively participate in the oil market management anyway. The cost of stabilising the market is too large for these small exporting countries and they reduced the coherence of OPEC. OPEC predominantly represents the Persian Gulf producers.

A new organisation to co-ordinate gas supplies to Europe and Asia from Russia, the Caspian Sea region, the Persian Gulf, North and West Africa, along similar lines as OPEC, is established by some gas producing countries. The Persian Gulf gas producers join this organization, called GASPEC. Russia is a member state based on the ownership of large parts of the pipeline network because its gas sector has been liberalised and (international) companies exploit the gas resources. In the new context of co-operation within OPEC and IEA and in the IEF, the management of the shifts in supply and demand in the oil and gas market is based on co-operation between the producer country organisations in conjunction with international companies that also provide spare capacity to the market. The task of national and international private companies of helping the public international institutions to stabilise the international oil and gas market is accepted under a set of conditions agreed on in the IEF.

Oil and gas prices are set within a pre-specified price band by adjusting the production of a number of key-producers. Indeed, the production and transportation capacity to carry out this function is made available through significant investments in production and transport capacity by the international oil companies. The investment climate is adjusted to facilitate these important investments and the costs (tax breaks and subsidies if needed) are shared among producers and consumers in the agreement on the price band. Generally, all oil is traded via the international market; no bilateral contracts are concluded. Any political ambitions of organisations such as OAPEC, OPEC, Gaspec and IEA are phased out and there is an intensive cooperation through an OPEC/IEA dialogue in the IEF.

Africa

Given the growing need to supply oil from regions outside the OECD area, Africa may become increasingly important.

North African gas and oil producing countries, such as Algeria, Libya and Egypt, have become substantial suppliers to nearby Europe. Gas is supplied through pipelines to Italy and Spain, as well as through LNG terminals on the European Atlantic and North Sea coast. Economic growth and the development of a stable middle class in some countries, which is partly due to investments in the region of successful immigrants in Europe, helps to secure political and social stability. The legitimacy of the increasingly secular governments and the decline of the Islam as a driving governance factor make the region interesting for investors in energy production and manufacturing. The countries co-operate with OPEC, if possible, to balance shifts in supply and demand in the oil market. Algeria as an important gas producer is a member of Gaspec and Nigeria might join too.

The position of West Africa remains difficult however. The presence of large hydrocarbon reserves has secured an intensified integration into the world economy. Yet, there is a continued dominance of the traditional elites; a situation that gives rise to prolonged civil discontent and instable governments. There is a weak climate for investments in additional production and export capacity compared to other oil and gas provinces. Under the *Markets and Institutions* storyline, this instability inspires attempts of the UN freedom forces to pacify the area. Nevertheless, the oil and gas producing areas/countries in particular remain difficult to pacify because of intense rent-seeking behaviour among certain groups. Therefore the industry concentrates on oil and gas production off-shore, as far as relevant.

Latin America

Under the *Markets and Institutions* storyline, Latin American countries become further integrated with the US economy. The current free trade areas, NAFTA and MERCOSUR are unified. Gradually, political difficulties between the member states are solved. Failing governments are replaced by more effective ones, helped by the liberalization of drug trade. The continent's larger countries, Venezuela, Argentina and Brazil are becoming more politically stable, and become the drivers behind a strong climate for growth, based on FDI and internal savings. The growing political and economic strength of the Latin American countries helps to overcome the traditionally difficult relationship with the US. and allows the Latin American countries to integrate deeper in the world economy and strengthen its relations with Europe and Asia.

Large Asian consumer nations

Under the *Market and Institutions* storyline, China is somehow persuaded to trust the functioning of the world oil markets. The creation of an outlet for Siberian oil, either in Daqing or nearby, served as an important prerequisite for this confidence in world markets. China sets up a joint naval surveillance programme with India, and maybe Japan, to guard the Malaccan Straits and secure its maritime transport routes. The Chinese state oil companies have to operate increasingly in the international oil and gas market under competitive conditions. However, the cautious Chinese government continues to support the companies until it is completely certain that a market based approach can deliver the required security of energy supply. It co-operates with the IEA.

Japan has benefited from its favourable regional surroundings to keep its military spending low. Japan realised that cooperation with China was preferable over a confrontation. Safeguarding the supply routes for oil and gas from the Persian Gulf is a joined interest and Japan contributes to the Chinese efforts. In its relation with Russia, energy cooperation is becoming more important than territorial disputes. Facing a growing China, Japan fears to be marginalized if it continues to compete politically, economically and militarily. Instead, Japan seeks deeper integration with China in a free trade type of framework and improves its contribution to Asian stability, thus substantiating a truly third *regime*, or possibly an *empire*.

5.5 Consequences for security of supply

The scenarios or storylines of section 5.4 are assumed to have consequences for the way in which disturbances (a supply shortfall or a disruption) in the supply of oil and gas will occur and for the way in which the effects of these disturbances can be remedied by the several types of policy tools to prevent, contain, deter and manage a crisis (see Chapter 4 and 6).

5.5.1 Economic growth and structural change

Storyline I: Regions and Empires

Economic development under the *Regions and Empires* story line evolves at a moderate pace. The countries are not able to achieve the full advantages of specialization and international trade and the various regions predominantly concentrate on their own development. Instead of competing on economic grounds in the market place, the rivalry of the regions is – in part – a competition based on political and military dominance. The costs and benefits of the functioning of the international political and economic system will become unevenly distributed, and can be very costly and inefficient to some.

Structural change, thus, will only slowly emerge and many regions will have an inward looking approach and will increasingly prefer domestically produced goods and services. This will hamper innovation in some societies and the diffusion of technology among regions. Also advantages of scale and scope can only be economised to a moderate extent. Particularly, developments in transport technology and practices remain relatively static and thus oriented towards the use of gasoline and diesel. Energy systems, in general, remain stable and based on proven technologies. As a consequence, energy use per unit of GDP in general does not decline, and a moderate growth in energy use is induced by growth in population and per capita production.

The very rapid growth expected in Asia-Pacific region in the beginning of the 21st century does not fully materialize, because relatively modest economic growth elsewhere in the world and the continued impediments to free movements of goods, capital and people do not provide the readily accessible markets for the products of this region.

International trade is further hampered by increased currency risks. Each region trades in the dominant currency of the region and the disintegration of the international capital markets into integrated regional capital markets prevents efficient inter-regional markets in currency risks to come about. Due to weak international economic and financial institutions and the overriding political influence on international economic affairs, financial market rules and regulations are regionally based and many times incompatible across borders. Bilateral agreements remedy some of these difficulties among allied blocks, but there is no international clearing-house arrangement. The EU can purchase its oil and gas in Euro from the main exporting countries in Russia, the Caspian Sea and the Persian Gulf, but not from Latin American producers who prefer American dollar denominated trade. The Euro benefits from the inter-regional rivalry in Asia, where the Renmibi and Yen compete for domination. The government interventions that underpin this rivalry undermine the confidence of oil and gas exporting countries to rely completely on these currencies. The Euro and Dollar maintain a stronger position in energy trade than the oil and gas flows would warrant.

Storyline II: Markets and Institutions

Economic development under the *Markets and Institutions* story line evolves at a considerable pace. The full advantages of specialization and international trade befall the several regions and increase with a deeper integration in the world economy. The regions can concentrate on their most efficient activities. Competition on economic markets induces a continuous fall in production costs, in part through the shifts of production systems towards regions with lower labour, capital and energy costs such as Pacific Asia, Latin America and Russia, and in part through the development of new technologies and distribution systems.

Structural change evolves at a rapid pace. Countries and regions go through the sequence from agricultural, raw materials producers to basic industrial production, followed by more specialized manufacturing and, later, develop into a services based economy. Goods and services are increasingly imported, as international trade develops rapidly. Innovation and the diffusion of technology gather speed and reduce the lifetime of production facilities and foster modernization. Advantages of scale and scope can be vigorously stretched. Also, developments in transport technology and systems proceed rapidly, as more and more goods and people are moved around. Local environmental problems and traffic congestion stimulates the growth of more efficient integrated transport systems and thus induce a decline in the use of gasoline and diesel. Yet, in the newly developing countries, transport systems remain at first based on traditional technologies.

The energy supply and consumption infrastructure is also modernized. As a consequence, energy use per unit of GDP in general does decline, but production and GDP growth induce a continued growth in absolute energy requirements. Very rapid economic growth will occur in parts of the Asia-Pacific region, Latin America and in Central Europe and Russia. Economic development elsewhere in the world and the free movements of goods, capital and people provide the easily accessible markets for the products of

these regions. Within this environment, it becomes likely that Kyoto-like approaches are being accepted at relative ease, as their impact in economic development is experienced as increasingly valuable. It is internalized rather automatically, as the main financial institutions include such requirements in their conditions for lending.

5.6 The oil market: Reserves, development, capacity, production and transport

Given the predicted development of energy demand and the geopolitical context, the several types of disruptions as defined in Chapter 4 will have different impacts. These are: 1) a *sudden disruption*, as a result of a political decision not to offer oil on the market, a war-situation, or as a result of technical and operational problems; 2) a *slowly emerging supply gap,* as a result of an dismal investment climate in production and/or transport capacity; and 3) a *slowly emerging supply gap*, as a result of the ideological choice of producer governments. These types of disruption, within the two story lines, constrain the several options for reacting to these disruptions. In this section, these situations and options will be discussed, first, in terms of the likelihood that they occur; secondly, in respect of their consequences, and thirdly, in respect of the use of strategies for abatement. In this section, we will discuss the world oil market. In Section 5.7, we will discuss the European gas market.

5.6.1 Sudden disruption

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a sudden disruption of oil flows from existing capacity of whatever kind certainly belongs to the possibilities. Depending on the scale, the specific facilities and the region(s) involved, this may cause great distress in the supply of oil, because of a lack of surplus production and transport capacity that allows for deliveries to be re-scheduled. Particular regions, for instance those that heavily rely on the supplies of one exporting region or country, such as the Persian Gulf, can be severely affected without the remedy of finding oil supplies elsewhere. The rigid contractual trade structure may impede a flexible adjustment of trade flows. Dependent on the way in which prices are determined in contracts, a price shock may affect these other contracts as well. Competition may arise between consumer countries to secure supplies in bilateral contracts. Eventually, if relevant, this may even lead to the use of military force to achieve access to shut in production capacity. Given the lack of a market, and the predominance of bilateral agreements, there are great difficulties in the operation of the IEA and EU emergency schemes as part of the crisis management policy, because the countries involved all have different interests. As a result, countries or regions that rely heavily on imported oil will be forced to create much larger strategic reserves because they cannot rely on the collective system of the IEA to come into effective operation. Particularly when one of the major suppliers in the OPEC is involved in the disruption, the ability of OPEC to apply its production management tools is rendered ineffective. This, in general, induces an increase in crude and product prices.

Storyline II: Markets and Institutions

Under the *Markets and Institutions* storyline, a sudden disruption of oil flows from existing capacity of whatever kind also belongs to the possibilities. Supply arrangements through markets, however, will lead to higher prices reflecting the scarcity of the specific oil, or products, involved. This induces market reactions and a re-allocation through price. The IEA and EU emergency schemes may be effective in reducing the price impacts, by alleviating a temporary shortfall in supply, in close co-operation with OPEC in case the disruption does not involve a country where the organisation's spare capacity is situated. It is

obvious that all oil flows are affected by higher prices, relative to their quality and transport requirements. This also implies that other producers are rewarded for their flexibility to export additional oil to the world market (spare capacity) with higher prices. Eventually, if relevant, collective or – less likely - unilateral military force may be used to achieve access to shut in production capacity.

In the event the Kyoto variant prevails, the lower share of hydrocarbons in overall energy use may cause larger problems. As remaining hydrocarbon use will be confined to those applications where it has no easy 'green' substitution, these activities may be impacted severely by the high prices. Moreover, a general reduction in the use of hydrocarbons will also reduce the surplus production and transport capacity available and thus the flexibility of the system. Higher prices for oil in this situation may not induce the efficient market reactions expected, as a consequence of the rigidity of the system. The Kyoto variant implies that in case of a high structural dependence of one or a few sectors where fuel switching is impossible, that the strategic reserves should be linked to the impact rather than to levels of imports or consumption. For the IEA and the EU this would require a redefinition of the requirement. The US currently has larger strategic reserves than required. Perhaps the EU should contemplate increasing its reserves above the minimum required level if a severe and focussed impact of a disruption is expected to occur.

5.6.2 Creeping supply gap through lack of investment climate

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a slowly emerging supply gap as a consequence of a dismal investment climate in various producer countries belongs to the possibilities. This is comparable to the current situation in the Persian Gulf and until recently in Russia. A growing lack of (surplus) production and transport capacity in specific regions may then induce opportunistic competition between consumers and suppliers to bilaterally secure supplies or investments elsewhere – with an exclusive contractual character. States and state oil companies may become progressively more involved to compensate for the lack of private capital. This will lead to more and more politicized oil trade, reinforcing the problem. Within the IEA and the EU, but also OPEC, it becomes increasingly difficult to calibrate the oil market management schemes, strategic stocks and information systems. The ensuing rigid contractual state-to-state trade structure may impede a flexible adjustment of trade flows. In addition, international conflict may arise over the exclusive relations of some large surplus oil producers with the several empires and regions.

Storyline II: Markets and institutions

Under the *Markets and Institutions* storyline, a slowly emerging supply shortfall as a consequence of a dismal investment climate is not very likely to occur. The current decline in spare capacity suggests that, under this storyline, the current institutions IEA, OPEC and IEF are not fully effective and that a market approach still has to become effective in some parts of the international system. Once all producing countries have adopted a market-based approach such inefficiencies disappear. Indeed, shifts in supply and demand are translated efficiently into shifts in (forward) prices in liquid markets. These higher prices induce market reactions and a re-allocation of supplies or investments in new production and transport capacity. The IEA and EU oil market schemes, plus a number of commercial agents, maintain an effective system of information sharing. Industry and the governments cooperate in establishing effective procedures for planning and environmental purposes.

When the Kyoto variant prevails in some of the regions, the expectations of a (obligatory) lower share of hydrocarbons in overall energy use – or emission trading - may cause investments in (surplus) production and transport capacity for oil to be delayed in these regions and their suppliers, or perhaps they will not take place at all. In this context the IEA and EU, may become ineffective and biased in information sharing regarding world oil, depending on how 'green' they are. Industry and governments may either fail to cooperate in setting environmental regulation for the energy industry or, in contrast, a very effective policy may emerge with respect to a 'green' energy system. Cost in this respect is not essential, as regional security of supply and the environment are more important as parallel objectives.

5.6.3 Slowly emerging supply gap as a result of religious and ideological choice

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a creeping supply gap, as a result of low investment levels that are motivated by ideological and religious arguments, belongs to the realm of possibilities. The circumstances referred to here would involve a growing isolationist approach of the world by major producing countries and a refocusing on domestic affairs. The conflict over economic rents from oil has created major opposition to the role of supplier of world oil markets and instead forces in society demand that domestic affairs and relations are given priority. It is not unthinkable that politically, groups in producer countries see the oil industry as the bringer of deep internal political and social rivalry rather than an industry that has created wide social and economic opportunities. Also in this situation, the most likely development is a situation in which supply constraints escalate over time. A growing lack of (surplus) production and transport capacity in specific regions may then induce opportunistic competition between consumers and suppliers over the remainder of production capacities to bilaterally secure supplies or investments elsewhere – with an exclusive contractual character. The ability to remedy the emerging supply gap to some degree depends for a large part on the importance of the producing country or countries for that matter that turn away from the world market. In case Saudi Arabia turns away from the world market and opts to supply less and less oil for export purposes, the ability to close the supply gap with oil supplies from somewhere else in world is small. OPEC in turn will be made ineffective as a market regulator.

Attempts will be made to unilaterally open up alternative areas for exploration and production, like in Alaska and Antarctica, and/or to develop other energy resources. States and state oil companies may become increasingly involved in oil investments and trade, causing an increasingly politicized oil trade, which reinforces the supply constraints for other regions. Within the IEA and the EU it becomes increasingly difficult to calibrate the oil market management schemes and information systems. The ensuing rigid contractual state-to-state trade structure may impede a flexible adjustment of trade flows. In addition, international conflict may arise over the exclusive relations of some productive oil producers with the several empires and regions.

Storyline II: Markets and Institutions

Under the *Markets and Institutions* storyline, with effective market institutions, a slowly emerging supply gap as a result of low investment levels that are motivated by ideological and religious arguments also belongs to the possibilities. Particularly when the benefits of integration in the world economy fail to benefit the wider population and economic rents only befall to the elites, a socio-economic and religious inspired turn around of the country is possible. If such a situation occurs, the strength of the insti-

tutions has been too small to convince local governments to democratise economic benefits of energy trade and economic growth. The most likely occurrence is a situation in which problems increase over time and in which everybody sees the problems emerging. Future scarcity is translated efficiently into shifts in (forward) prices in liquid markets. These higher prices induce market reactions and re-allocation of supplies or investments in new production and transport capacity to 'unaffected' promising areas, such as Russia or West Africa, or different technologies, like nuclear and 'green' energy. The IEA and EU oil market schemes, plus a number of commercial agents, maintain an effective system of information sharing. Industry and the governments cooperate in establishing effective procedures for planning and environmental purposes. Attempts will take place to open up alternative protected areas for exploration and production, like in Alaska and Antarctica.

In case the Kyoto variant prevails, the expectations of a (obligatory) lower share of hydrocarbons in overall energy use – or emission trading – plus the reduced availability of oil as capacity will be shut in for ideological reasons, may cause investments in (surplus) production and transport capacity for oil to be delayed, or not taking place at all. This combination, however, may be very powerful in bringing about a transition to nuclear and/or renewable energies. The IEA and EU are effective in information sharing and technology diffusion, while industry and governments cooperate in location and environmental regulation. A real supply disruption, unless OPEC can assist in reducing the impact, will speed up adjustment priorities and objectives.

5.7 The gas market: Reserves, development, capacity, production, transport

5.7.1 Sudden disruption

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a sudden disruption of gas flows from one of the large suppliers, Russia, Algeria, Norway, the Netherlands or the UK belongs to the possibilities. Depending on the scale, the specific facilities and the region(s) involved, this may cause great distress in the supply of gas, as consequence of a rigid production and transport capacity and the difficulty, in the absence of a proper infrastructure to physically re-schedule deliveries. Depending on the way in which prices are determined in contracts to the several types of users, a subsequent price shock may affect these other contracts as well. Competition may arise between consumer countries to secure supplies in bilateral contracts. Given the lack of a real international market, and the predominance of bi- or multilateral agreements, there are great difficulties in the operation of possible IEA and EU emergency schemes, as the countries involved all have different interests and gas supply structures. Also Gaspec cannot assist in re-allocating supplies. Military force seems out of the question in the current geo-political context and the grid-bound character of gas trade.

Storyline II: Markets and Institutions

Under the *Markets and Institutions* storyline, a sudden disruption of gas flows from one of the large suppliers, Russia, Algeria, Norway, the Netherlands or the UK also belongs to the possibilities. Supply arrangements through markets, as far as technically possible, will lead to higher prices to most users, reflecting the scarcity of gas. This will induce market reactions and a re-allocation, possibly through the use of dual-firing facilities and supplies from (emergency) storages. The IEA and EU are not able to

solve problems through cooperation and security schemes, as the difference between the countries affected are too large and because the infrastructure does not allow for large scale adjustments.

In case the Kyoto variant prevails, the higher share of natural gas in overall energy use will cause larger immediate problems. Yet, the larger scale of gas use also allows for a greater freedom to switch to other fuels, or to stop the activity in which it is used completely. A general reduction in the use of gas – forced by price - will enhance the surplus production and transport capacity available and thus the flexibility of the system.

5.7.2 Creeping supply gap as a result of a dismal investment climate

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a creeping supply shortfall for gas as a result of a dismal investment climate in one, or more, of the supplying countries belongs to the possibilities. The most likely occurrence is a situation in which problems, such as the lack of trust or inadequate regulatory structures, increase over time and in which everybody sees the problems emerging. The insight of lack of (surplus) production and transport capacity in specific regions in itself is not a problem. It will, initially, imply that no new consumers will turn to natural gas and that other energy options will be pursued. Existing production capacity will continue to be used until it is depleted. By then problems may emerge, but until this is the case, all kind of diplomatic and economic initiatives can be undertaken to improve the situation. States and state oil companies may become increasingly involved to compensate for the lack of private initiative. This will lead to an increasingly politicized trade in gas.

Storyline II: Markets and Institutions

Under the *Markets and Institutions* storyline, with really effective market institutions, a slowly emerging supply gap for gas as a result of a dismal investment climate can only occur when the regulatory system fails to offer sufficient long term security to investors or when a political (and accompanying regulatory) shift in a country occurs where the multilateral institutions cannot intervene (depending also on the size and quality of the military forces), such as Russia. In such a situation, shifts in supply and demand are translated into volatile shifts in (forward) prices. As a consequence of this uncertainty, these higher prices fail to induce market reactions and investments in new production and transport capacity. If the regulatory uncertainty is within the EU, supplies from new producers, such as the Persian Gulf and the Caspian Sea region may not come about. The IEA and EU energy market schemes, plus a number of commercial agents, may (or not) effectively reduce the uncertainty through an effective system of information sharing. Industry and the governments may cooperate in establishing effective procedures for planning and environmental purposes. Otherwise, investments will take place in other supplying countries ofr alternative energy systems.

In the event the Kyoto variant prevails in Europe, the expectations of a (obligatory) lower share of other hydrocarbons in overall energy use – or emission trading - may require higher investments in gas production and transport capacity. Yet, similar problems may arise as in the regular *Markets and Institutions* storyline. Industry and governments may either fail to cooperate on location and environmental regulation for the gas industry or, in contrast, a very effective policy may emerge with respect to a ‘green’ energy system, with an important contribution of gas. Indeed, to embark on a ‘green’ policy, the free market

has to be corrected anyway. Cost is not essential because the regional security of supply and the environment are more important parallel objectives.

5.7.3 Creeping supply gap through religious and ideological choice

Storyline I: Regions and Empires

Under the *Regions and Empires* storyline, a slowly emerging supply gap as a result of an investment gap due to ideological and religious reasons belongs to the possibilities, particular with regard to the North African suppliers, the potential suppliers in the Persian Gulf and in some countries in the Caspian Sea region. Also in this situation, the most likely occurrence is a situation in which problems increase over time and in which everybody sees the lack of (surplus) production and transport capacity in specific regions emerging. Yet, a revolutionary situation may also develop overnight, causing immediate problems. This will induce a timely move away from gas imported from the difficult countries. As a consequence, the overall share of gas in the primary energy balance of Southern Europe remains moderate. In case of a future supply gap with regard to Russia, Northern Europe will increase its capacity to receive LNG from elsewhere. For Eastern Europe the possibilities to diversify away from Russian gas are small, except when the gas pipelines from the Caspian Sea and the Persian Gulf are developed, and other energies, like coal, oil and nuclear power, will most likely be introduced to compensate for the gas supply gap. In case of a future supply gap with regard to the Persian Gulf, Russian supplies can fill the gap. In general, a slowly emerging supply shortfall will stimulate attempts to unilaterally open up new alternative areas for exploration and production, possibly in Norway and Russia, and an enhanced use of LNG in the South.

Storyline II: Markets and Institutions

Under the *Markets and Institutions* storyline, with really effective market institutions, a slowly emerging supply gap as a result of an investment gap for ideological and religious reasons is not very likely to occur. Problems increase over time and everybody sees the problems emerging. Future scarcity is translated efficiently into shifts in (forward) prices in moderately liquid markets. These higher prices induce market reactions and re-allocation of supplies or investments in new production and transport capacity to 'unaffected' promising areas, or different technologies, like nuclear and 'green' energy. Industry and the governments cooperate in establishing effective procedures for planning and environmental purposes. Attempts will take place to open up alternative protected areas for exploration and production, for example in Norway and Russia.

In the event the Kyoto variant prevails, the expectations of a (obligatory) lower share of hydrocarbons in overall energy use – or emission trading – plus the reduced future availability of gas for ideological reasons may be a very powerful driver to bring about a transition to a nuclear and/or renewables powered energy system. If the expansion of gas in the EU market is hampered, it is possible that a smooth transition to alternative fuels will be more costly because, in general, gas is seen as a bridge to the future, in which decarbonising fossil fuels, CO_2 storage in old gas fields and hydrogen play an important role. The approach to introducing the more sustainable energy balance may have to be substantially altered Yet, uncertainty may also cause a standstill in any large scale investments in (surplus) production and transport capacity. Industry and governments may fail to cooperate in location decisions and environmental regulation.

5.8 Conclusion

From the storylines emerge different worlds and different levels of energy security of supply. It is clear that the EU the security of oil and gas supply will be the greatest in a *Markets and Institutions* world. The multilateral approach and the strength of the collective policies that are possible under this storyline will greatly enhance security of supply, and the ability to continue and complete the internal market integration are the largest. Yet, we must also conclude that the multilateral forces in the current world have become weaker in the past 10 years. The likelihood of a *Regions and Empires* storyline can no longer be considered as farfetched as originally thought. In the event that world is developing along the *Regions and Empires* storyline, security of oil and gas supplies will be much harder to achieve for the EU. We have identified a number of crucial aspects of variation in these storylines. These include the degree of multi- or unilateralism within the world order, the effect and credibility of information systems, the presence of trust to support international agreements and collective action, the presence of a favourable investment climate and the degree of economic and technical flexibility of the energy systems.

Table 5.1 Characteristics of the Regions and Empires storyline.

Area	Stability in Energy Policy	Effects on EU relations	Situation
Europe	• Not stable, lack of unity	• Confrontations among members of Atlantic and Central European orientation	• Moderate expansion towards an un-stable Eastern Europe. • Economic integration at slow pace • National, regional and sectoral tensions Political discussions over issues, like social and energy policy and food supply.
US	• Stable	• Unilateral course, • Conflicts over policies and trade	• Political unilateralism • Creation of a *back-yard* to supply oil, gas and other strategic goods. • Inclination to stabilize the relevant regions • Energy policy linked up with defense policy and foreign affairs.
Russia	• Stable	• Pragmatic cooperation around trade in energy, • Conflicts over political integration and spheres of influence in central Europe and the FSU satellites	• Relatively forceful, • Political unilateralism • Re-creation of a *back-yard* into FSU republics • Inclination to stabilise the relevant regions • Growing role of defense policy
Middle East	• More or less instable	• Minor role for OPEC in managing oil • Bilateral contracts with consumer countries • If risks are too high very little capacity additions	• Internal unrest, caused by tensions between rulers and dissident social groups, fiscal crises. • Depending on the balance of power within and among the regionís main countries, the regions are more or less stable ñ or can be in complete turmoil.
West Africa	• Instable	• Weak climate for investments in additional production and export capacity • Attempts to protect the oil and gas producing areas	• Enhanced integration via oil and gas trade • Prolonged civil discontent, instable governments and terrorism
North Africa	• Potentially (In)stable	• North African gas and oil producing countries have the potential to become main suppliers to Europe.	• Political and social stability will be a function of relations with the EU and the legitimacy of these countriesí governments, and the more general evolution of the role of the Islam as a driving factor behind the governance in the region.
Latin America	• Large parts of Latin America may become excluded from the central world regions.	• Predominantly supplying internal needs of oil and gas. • Limited role as the USD backyard, through NAFTA • US will never be allowed to actively play a stabilizing role in the area	• Latin America struggles with political difficulties and failing systems of governance • Instabilities in the continentís larger countries • Traditionally difficult relationship with the US
Asia	• Instable	• Competition between Japan, China, the US and the EU over resources	• Political, social and economic stability will be a function of restructuring of Japanese system and the development of China. • Large dependence on the occurrence of the moderate economic growth and markets in the rest of the world

Table 5.2 Characteristics of the Markets and Institutions storyline

Area	Degree of Stability	Effects on EU relations	Situation
Europe	• Stable, Unity	• Minor confrontations with new members	• Expansion towards an increasingly stable Eastern Europe. • Economic integration • Political discussions over issues, like social and energy policy and food supply solved in EU Governance framework
US	• Stable	• Multilateral cooperation in international organizations	• Political multilateralism • Creation of a *back-yard* by association with free trade organizations • Energy policy linked up with environmental and trade policy
Russia	• Stable	• Multilateral cooperation in international organizations and EU • Minor conflicts over political integration and spheres of influence	• Increasingly modernism and democratic • Political multilateralism
Middle East	• More or less instable	• Important role for OPEC in managing oil • Oil trade via the market • If risks are too high very little capacity additions	• Internal unrest, caused by tensions between rulers and dissident social groups, fiscal crises. • Depending on the balance of power within and among the regionís main countries, the region is more or less stable ñ or can be in complete turmoil.
West Africa	• Instable	• Weak climate for investments in additional production and export capacity • Attempts to protect the oil and gas producing areas through international organizations	• Enhanced integration via oil and gas trade • Prolonged civil discontent, instable governments and terrorism
North Africa	• Potentially (In)stable	• North African gas and oil producing countries have the potential to become main suppliers to Europe.	• Political and social stability will be a function of relations with the EU and the legitimacy of these countriesí governments, and the more general evolution of the role of the Islam as a driving factor behind the governance in the region.
Latin America	• Increasingly stable	• Supplying internal needs of oil and gas and exports • Continentsí role as the USí backyard, through association via NAFTA and MERCOSUR	• Latin America overcomes failing systems of governance • Increasing political and economic stability in the continentís larger countries • Traditionally difficult relationship between the US solved through multilateral agreements
Asia	• Increasingly stable	• Japan, China, the US and the EU secure resources via the market	• Political, social and economic stability is enhanced as a function of economic growth driven by a restructured Japan and the development of China and the rest of the world

Table 5.3 Characteristics of global markets and Kyoto

Area	Degree of Stability	Effects on EU relations	Situation
Europe	• Stable, Unity	• Minor confrontations with new members on equity issues and environmental priorities • Spatial relocation of activities	• Expansion towards an increasingly stable Eastern Europe. • Economic integration and environmental policy • Political discussions over issues, like social and energy policy and food supply solved in EU Governance framework
US	• Stable	• Multilateral cooperation in international organizations for trade and environmental policy	• Political multilateralism • Creation of a *back-yard* by association with free trade organizations • Energy policy linked up with environmental and trade policy
Russia	• Stable	• Multilateral cooperation in international organizations and EU on trade and environmental policy • Minor conflicts over political integration and spheres of influence	• Increasingly modernism and democratic • Political multilateralism • Economic policy linked up with environmental and trade policy
Middle East	• More or less instable	• Important for OPEC in managing oil and conflict over Kyoto • Diversification and aid programmes • If risks are too high very little capacity additions	• Internal unrest, caused by tensions between rulers and dissident social groups, fiscal crises. • Depending on the balance of power within and among the regionís main countries, the regions are more or less stable or even a complete turmoil.
West Africa	• Instable	• Weak climate for investments in additional production and export capacity • Attempts to protect the oil and gas producing areas through international organizations	• Enhanced integration via oil and gas trade • Prolonged civil discontent, instable governments and terrorism • Aid programmes via environmental policies
North Africa	• Potentially (In)stable	• North African gas and oil producing countries have the potential to become main suppliers to Europe.	• Political and social stability will be a function of relations with the EU and the legitimacy of N-A governments, and the more general evolution of the role of the Islam as a driving force for governance in the region.
Latin America	• Increasingly stable	• Supplying internal needs of oil and gas and exports • Continentsí role as the USD backyard, through association via NAFTA and MERCOSUR	• Latin America overcomes failing systems of governance • Increasing political and economic stability in the continentís larger countries • Traditionally difficult relationship between the US solved through multilateral agreements
Asia	• Increasingly stable	• Japan, China, the US and the EU secure resources via the market • Multilateral cooperation in international organisations for trade and environmental policy	• Political, social and economic stability is enhanced as a function of economic growth driven by a restructured Japan and the development of China and the rest of the world

6

Two Storylines and the Management of EU Security of Oil and Gas Supply

6.1 Introduction

In the analysis of the influence of geopolitical developments on the security of oil and gas supply of the EU, we have attempted to show that both the risks (the probability of an event affecting the security of supply) and the exposure (the vulnerability of society to the risks) are increasing and will continue to increase in the period up to 2020. The risks and exposure are different for oil and gas, both in the short and the long term and in terms of the geopolitical risks. As a consequence, the range of policy tools that can be effectively employed differs between security of oil and gas supply.

But oil and gas cannot be totally treated separately. Inevitably, this is a consequence of the geographical dispersion of oil and gas deposits. Russia is an important producer of gas for the EU, but increasingly Russian and Caspian Sea region oil exports are gaining market share as a welcome diversification away from the Persian Gulf and OPEC oil. Yet, for gas, the Persian Gulf and the Caspian Sea region are seen as a source of new gas supplies and they are considered as a welcome diversification away from Russian gas. These diversification policies, designed to deal with the exposure and risks in the supply of oil and gas, are confirming evidence of the limited solutions to the security of supply risks. Recent experience has suggested further evidence of a link between the oil and gas sector. Examples are the fact that European gas prices are tied to oil market prices, while in the US market, despite gas-to-gas competition, oil and gas prices show a significant correlation in price movements.

Notwithstanding these similarities, there are, of course, major differences in exposure and risk between the oil and the gas industry influencing the response to a supply shortfall. Such a shortfall could be a short-term interruption of supply, or a long-term phenomenon. The fact that there is no international market for gas with the same kind of liquidity as the international oil market must be considered as a vital difference. The gas imports of the EU from two very large external suppliers, Russia and Algeria, therefore imply a substantial structural dependence.

A limited shortfall in oil supplies from the Persian Gulf could be filled by supplies from elsewhere, depending on available spare capacity. A limited shortfall in oil supplies due to a lack of growth in production capacity is slower to develop and could be compensated for by capacity growth elsewhere. The interest of oil companies in West Africa and the Former Soviet Union must be seen from this latter perspective. The main problem with regard to the potential to fill a potentially emerging oil supply gap is that other oil producing countries are also experiencing political and governance problems, and exhibit the same disappointing performance of their economies as the Persian Gulf countries. Oil production is a high economic rent activity that cultivates not only politically and economically acceptable rent-seek-

ing behaviour but also unfortunately also corruption.[117] In many countries, the rent is not only a reward for controlling the oil production, but is also a reward for the exploitation of social, political and legal privilege.[118] Not only do the Persian Gulf countries have great difficulties with striking a balance between privilege and performance, but countries such as Algeria, Nigeria, and Venezuela also experience these problems. This pattern can easily be repeated in countries that (re-)enter the international oil (and gas) industry, such as the Caspian Sea region and countries in West Africa, and become nearly completely dependent on oil and gas incomes.[119] Most oil producing countries have rather centralised governments and relatively large bureaucracies that have difficulty in acting in the social welfare of the country, let alone maximising this welfare.[120] The continued stagnation in the political, social and economic development in the Middle East and in other producer countries creates uncertainties with regard to the political sustainability. Such uncertainties could create a more cautious approach of potential private (international) investors or cause the government to favour non-energy socio-economic investments. As a result, future supply from such a country could stay below potential.

In the last couple of years, price volatility has become an additional issue for consumers and producers alike. Asymmetric interests in a certain level of production and price among the players in the oil value chain has undermined oil market stability. Given the distribution of reserves and the potential future production capacity in the Persian Gulf countries, the domestic economic pressures in the producer countries will become a more and more forceful driver of oil policies and could potentially undermine a cooperative oil policy among main producer countries.

The security of supply in oil largely depends on the stability of the Persian Gulf. The availability of spare capacity in this region is very important for the future operation of the international oil market. Moreover, importing countries greatly benefit from the availability of spare capacity and the willingness to make this available in a transparent manner to the market. Alternatively, the size, availability and the rules of employment of strategic oil reserves by consuming countries is important for producing countries. Co-operation among producers and consumer countries could facilitate the reliability of oil market management, such as the International Energy Forum. Although the strength of the fundamental differences over rent distribution should not be under-estimated, the common interest to stabilise markets is also strong.

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117 Leite, C., Weidman, J., *Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth*, Washington D.C.: IMF Working Paper, WP/99/85, 1999, pp. 30-31.

118 Karl, *Op. cit.*, 1997, p. 6.

119 The Chad project in Africa is an attempt to create more local benefits and reduce the risk of corruption. The involvement of the World Bank has been crucial to bring this project to the production stage. Although both the World Bank and the IMF have researched these risks in mineral producing countries, more research should be done to what extent also longer term investment level in production and export capacity are hampered. Our understanding of the causal relationship between oil or gas production and political and economic instability of countries irrespective of the regional problems is still incomplete.

120 Van der Linde*, Op. cit*., 2000, pp. 27-35.

In our view, the risks and potential exposure of the EU to a disruption or a supply shortfall are changing in the next decades irrespective of the storylines. This is due to the growing import dependency and a certain degree of concentration in the source of the imports on the Persian Gulf, the Caspian Sea region and Russia for oil, and North Africa, Russia, the Caspian Sea region and the Persian Gulf for gas. A selection of these risks and vulnerabilities in oil and gas supply are presented in Tables 6.1 and 6.2.

Table 6.1 Risks for the EU for a supply disruption in a geopolitical context irrespective of the two storylines

Oil	Gas
• Persian Gulf is unstable and there is a danger of problems spilling over in Caspian Sea where stability also depends on Russia. • Domination of a single sector has created economic and political instability in producer countries with a dependence on oil income. • Political and strategic weakness of Persian Gulf countries invites the use of strong interventionist policies by large consumers. • Supplies will concentrate increasingly on the Persian Gulf and the Caspian Sea region. These countries share economic similarities, which could strengthen their oil policy goals but they could lack cohesion in political terms. • The Middle East is deeply divided by political, religious and ethnic conflicts which have created widespread stagnation of the societies and conflicts among the countries in the region. • Existing containment measures need to be adapted to the changing risk profile of the EU.	• The balance of interest between supplier and consumer country (based on mutual dependence) is changing between EU and Russia if/when the Russian economic dependence on gas revenues declines. • If liberalisation leads to loss/reduction of long-term contracts, then global competition between markets reduces longer-term security of supply. • If the EU market cannot offer new long term contracts for additional supplies, the prospects for a shortfall on new supplies to occur will be high • The creation of Gaspec or any other form of co-operation between the EU external suppliers with the intent to exert market power. • The political stability of Algeria is fragile.

Table 6.2 EU exposure to a supply disruption in a geopolitical context irrespective of the two storylines

Oil	Gas
• Low to moderate growth of EU demand but imports of oil are increasing • Enlargement of the EU will further increase EU demand for imported oil. • Ability to diversify to origin becomes smaller and dependence on Persian Gulf supplies grows. • Limited possibilities for prevention without approval of the US. • Liberalisation of oil industry in producer countries will reduce exposure. • Declining self-sufficiency in refining will limit crisis-management options when crude oil from strategic stock is released.	• Growing demand for imports for EU-15 • Enlargement brings more dependence on gas • Enlargement brings more dependence on a single supplier • More limited measures for containment in existence than for oil: additional or alternative sources are physically unavailable. • Liberalisation will further erode existing security arrangements • If Gazprom becomes the conduit for most gas from the Caspian Sea region and Iran will not manage to develop competitive pipeline exports to Europe for the next 10-15 years, Gazprom dominance as a supplier will increase.

We further argued that the combination of increased risks and vulnerability and the liberalisation of the gas and electricity markets may create additional uncertainties with respect to security of gas supply. The combination of external and internal uncertainties, particularly with regard to gas, reduces the incentive to make timely investments in production and transportation capacities. In due time, this might create a mismatch in demand and supply as a result of underinvestment.

In the next sections, the analysis will focuss on the level of uncertainty concerning the main oil and gas supplying regions. The level of uncertainty regarding the security of oil and gas supply, differ for the two storylines, and also the ability to effectively employ certain policy tools. First, we will discuss the storylines *Markets and Institutions* and *Regions and Empires* with regard to the policy tools presented in Chapter 5, namely, prevention, deterrence, containment and crisis management. In the following sections we will look at the policy tools from the perspective of the storylines, the level of uncertainty and the ability to deal with a supply disruption and a slowly emerging supply shortfall for oil and gas.

6.2 Storylines and EU policy tools

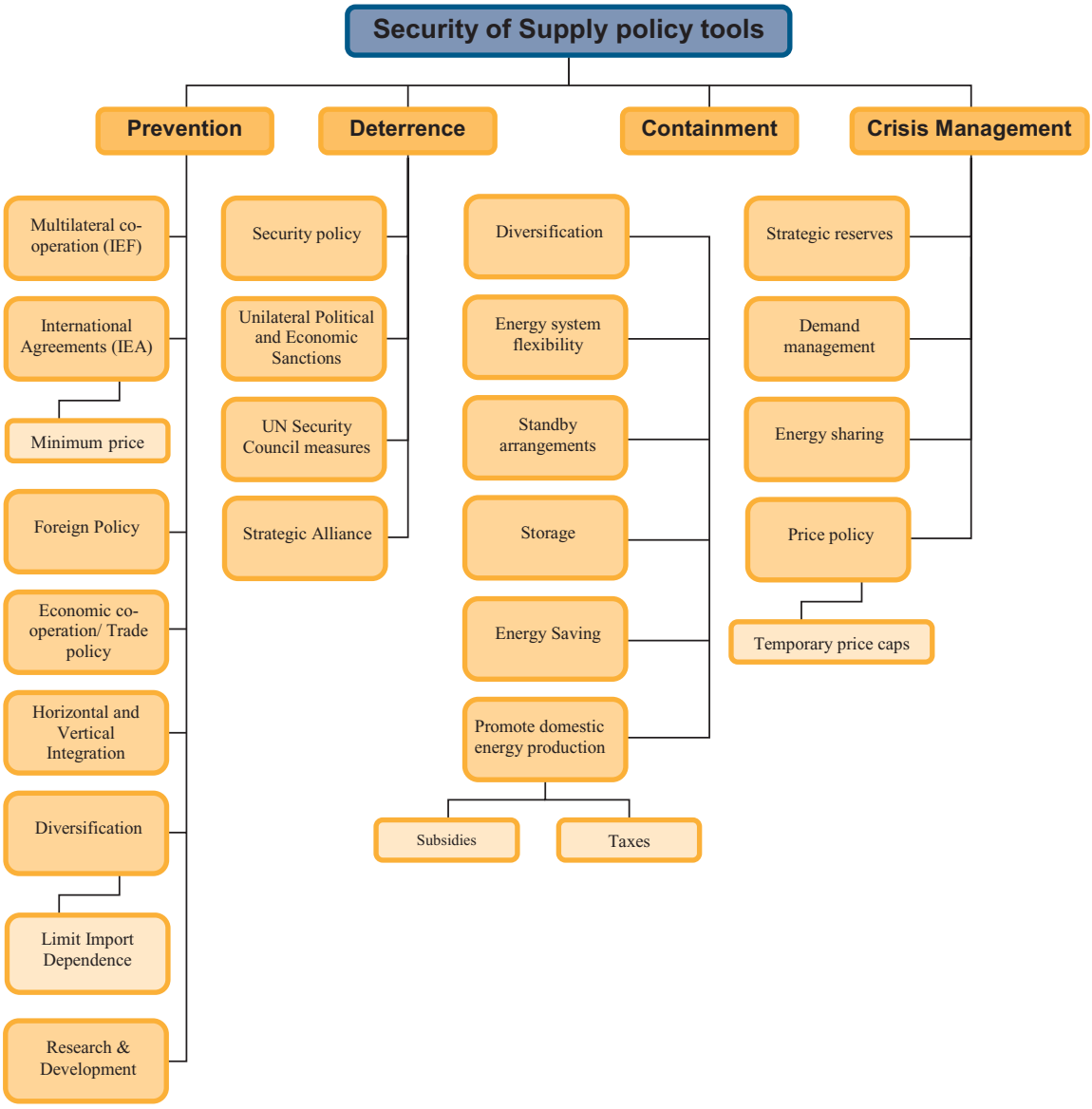
In Chapter 5, we have developed storylines on the basis of possible geopolitical developments over the next two decades. We mentioned earlier that the available policy tools, such as international co-operation, would not be highly effective in the *Regions and Empires* storyline, while they would, in contrast, be very important in *Markets and Institutions* storyline. In general, we suggested that prevention, deterrence, containment and crisis management strategies are not likely to be realised in the same manner for the respective storylines. It is, therefore, important to look at the EU energy policy toolset and determine which avenues are open or closed in the storylines (see Figures 6.1, 6.2 and 6.3). We look at the set of instruments available in the next sections.

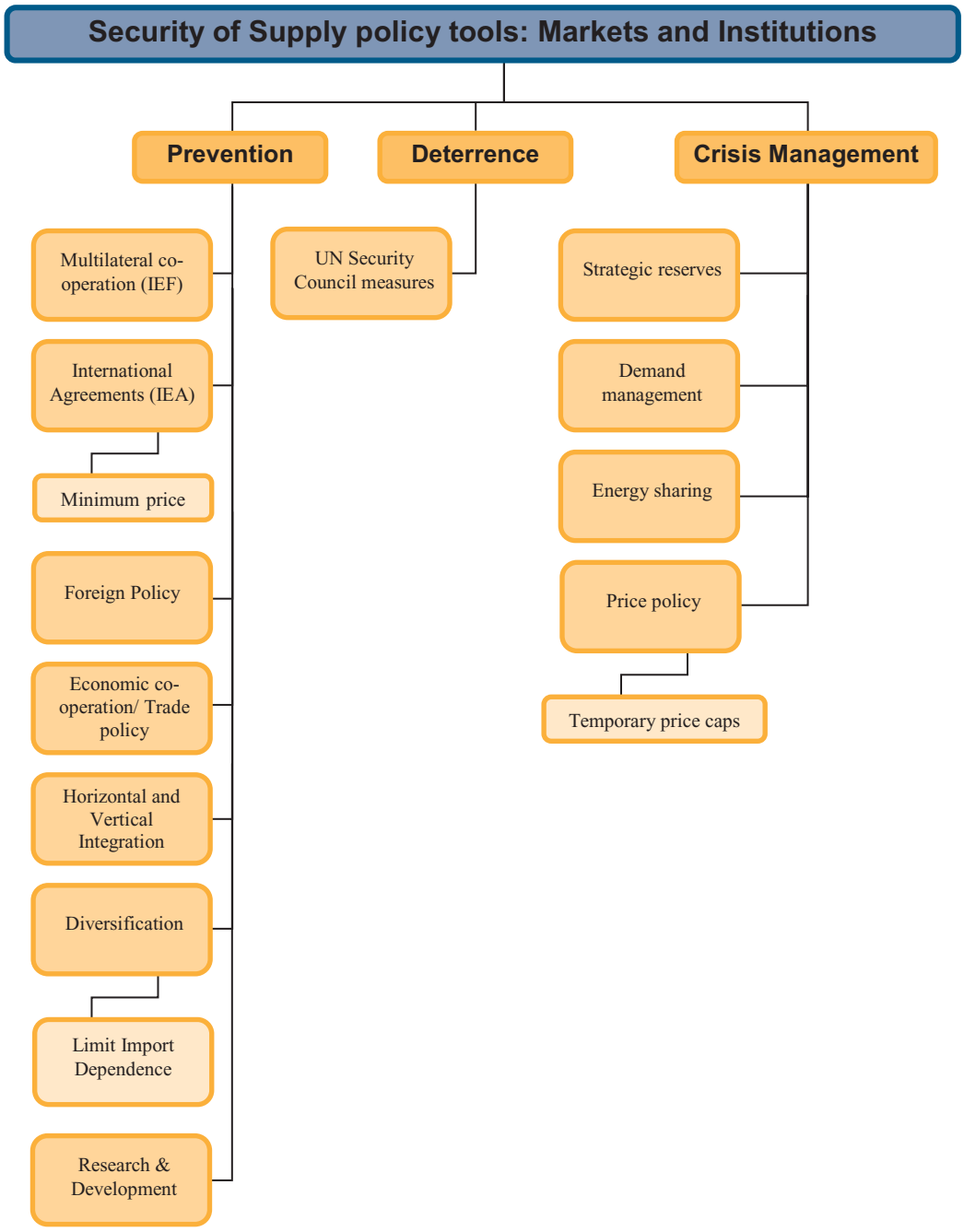
6.2.1 Prevention

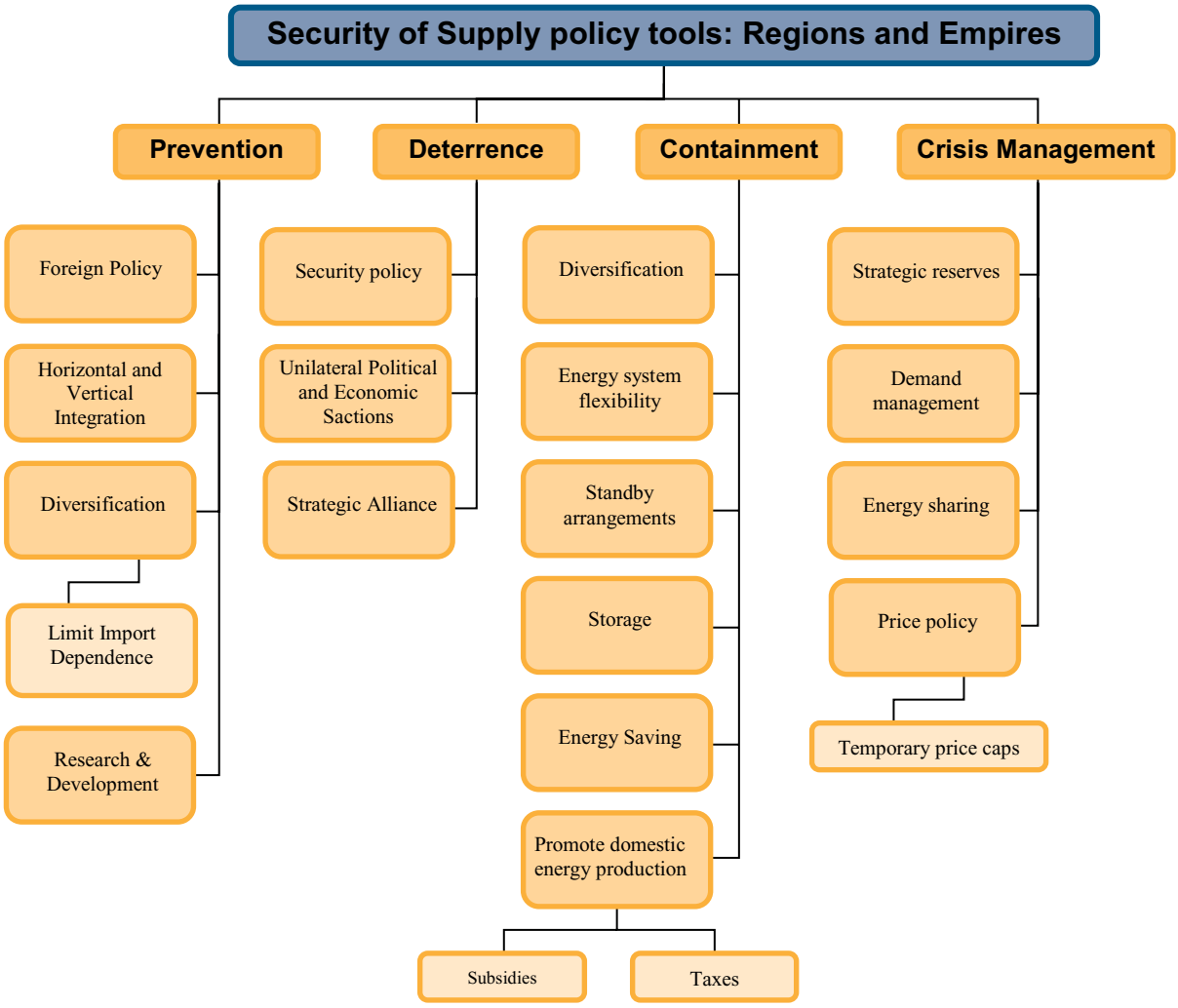
The fundamental view discussed above mostly emphasizes that the quality of the prevention policy tools is more pronounced in the *Markets and Institutions* storyline, because the governance of the international political and economic system, including energy issues, is reliant on international co-operation and stronger international institutions. In the political and economic climate of the *Markets and Institutions* storyline, the market will be given more space. Import dependency is less of a strategic issue because oil and gas will be made available through the market, with a crucial role of international co-operation in the International Energy Forum (IEF), the International Energy Agency (IEA) and the other international economic institutions such as IMF, World Bank and WTO. The impact of these institutions facilitates the development of important policy tools, supporting and protecting the value of investors' assets. In this storyline, the members of the UN Security Council agree to effectively police the world, with sanctions and/or interventions in regional conflicts, reducing the danger of failing state power in oil and gas producing countries. For instance, the peace process in the Middle East can be underpinned by the efforts of the world community. The strength and coherence of the international institutions is assumed to increase. The implication is that a growing number of international governance structures are more likely to soften the preponderance of strategic national interests. The international institutions manage to address the economic hardship in oil and gas producing countries and generate the drive for the introduction of more sustainable energies in an increasingly effective manner. The risk of an important producing region, such as the Persian Gulf, slipping into turmoil is less likely (but not impossible in the course of this process of institutional strengthening) in the *Markets and Institutions* storyline because

trade and consumer markets are open for unprocessed and processed supplies from all producers. FDI help to develop production and transportation capacities and diffuse technologies. Horizontal and vertical integration is based on efficiency and companies from producer and consumer countries are likely to operate in each other markets. Research & development underpins the move to more value added, energy saving (also in developing countries) and the introduction of more sustainable energies in producer and consumer countries alike. The process of establishing a strong *Markets and Institutions* state of affairs requires the credible commitment of the major consumer and producer countries to invest resources in developing policy tools that will, undoubtedly, by a process of leaps and bounds, give a new level of coordination. Thus multilateralism as the main governance tool for the international political and economic system is undisputed as a guiding principle among the nations. The efforts to strengthen the IEF help the institution to become an important liaison between the IEA and OPEC.

Figure 6.1 Storylines and security of supply policy tools




Security of Supply policy tools: Markets and Institutions
Prevention
Deterrence
Crisis Management
Multilateral co-operation (IEF)
International Agreements (IEA)
Minimum price
Foreign Policy
Economic co-operation/ Trade policy
Horizontal and Vertical Integration
Diversification
Limit Import Dependence
Research & Development
UN Security Council measures
Strategic reserves
Demand management
Energy sharing
Price policy
Temporary price caps


Security of Supply policy tools: Regions and Empires
Prevention
Deterrence
Containment
Crisis Management
Foreign Policy
Horizontal and Vertical Integration
Diversification
Limit Import Dependence
Research & Development
Security policy
Unilateral Political and Economic Sactions
Strategic Alliance
Diversification
Energy system flexibility
Standby arrangements
Storage
Energy Saving
Promote domestic energy production
Subsidies
Taxes
Strategic reserves
Demand management
Energy sharing
Price policy
Temporary price caps

This point sheds light on the foreign policy and international co-operation efforts of the EU. From this vantage point, the EU's efforts will be focussed on strengthening the international institutions and ensuring the completion of the internal energy market. In the *Markets and Institutions* storyline, the process of unbundling distribution networks, production and trade will continue in an increasingly efficient and open market. The process of integrating eastward is continued. Turkey becomes a member state of the EU and Russia enters the European Economic Space (EES), perhaps in preparation for membership at a later date. Import dependency is related to security of delivery (shorter term) rather than security of supply, although policy measures to cover disruptions are maintained to deal with technical, operational and market failures. The market addresses problems regarding mismatches in demand and supply, but the minimum price for oil (and perhaps later also for gas) is maintained to reduce the effect of economic up and downswings in the market and to limit to a certain degree the subsequent investment uncertainties (see also Chapter 3). In a growing EU gas market, the capacity for storage must grow to balance supply and demand over the winter en summer season, given the growing imports of gas from remote locations that require a high level of capacity utilization. It is advisable to examine these needs in further depth, also in the context of the current considerations of compulsory strategic stocks. In an advanced stage of the *Markets and Institutions* storyline, the development of strategic reserves in addition to the operational storage needs is seen as an unnecessary and costly option if the integration of the EU-Russian and EU-Algerian natural gas market deepens and relations are good.

Conversely, the *Regions and Empires* storyline stresses strategic alliances and bilateral political and economic co-operation. Because competition for scarce resources between consumer countries cannot be expected to alleviate conflict, the risk of key producing regions or countries slipping into turmoil is high. This point sheds light on the view that foreign policy is strategically motivated by security of supply issues, while trade agreements will be bilateral to serve the domestic interests of the *Regions and Empires*. Thus, the level of distrust among the nations is large, and should involve a weakening of the existing international (economic) institutions. For instance, efforts to underpin the Middle East peace process will be limited to those countries that have established a sphere of influence in the Middle East or belong to an alliance with such a sphere of influence.

Given the extensive reserves in oil and gas, it is probable that the Middle East will continue to be contested among the US, EU, China and Japan (and perhaps India), and that regional conflicts will intensify. From a strategic point of view, horizontal and vertical integration of international energy companies, even in the EU, is seen as a key tool to gain access to resources, while foreign policy efforts are increasingly considered as acceptable to underpin the FDI of the national energy companies. An issue arises here in respect of the EU competition policy, struggling for an internal EU market that is not dominated by large energy companies. It seems wise to take this process of unbundling not too far, or even to reverse it, to allow the companies to operate abroad, on the basis of a strong market positions at home. The companies compete for access to resources and help to establish spheres of influence in the regions, while international trade in oil and gas will become more structured within regions and among strategic allies. The relations with Russia, Algeria and other North African countries, which are important oil and gas suppliers of the EU, become even more important than in a *Markets and Institutions* storyline.

In a *Regions and Empires* storyline the oil and gas industry won't be coordinated by the international market, but by means of strategic bilateral agreements and long-term contracts between the main com-

panies in the EU, Russia and Algeria. The importance of bringing Algeria strongly in the sphere of influence of the EU to prevent 'Persian Gulf'-like uncertainties is crucial. Russia will develop in a strong 'empire' itself and strategic, mutually advantageous, relations between the EU and Russia can reduce the security of supply and demand risks. Nevertheless, the expansion of the gas market will, unlike the prediction in chapter 6, be less buoyant than in a *Markets and Institutions* storyline. The barriers to the development of LNG terminals in the EU, of which Third Party Access (TPA) is an example, must be removed in order for investors to consider this option. This being said, the LNG import capacity can help, nevertheless, to diversify the flow of gas and reduce the dependence on only a few suppliers. The US regulatory authority has already relaxed its conditions for LNG terminals, and the EU might loose out in the competition for new LNG supplies in the Atlantic Basin market. For the moment, Gas Directive 2003/55/EC article 18 specifically enumerates the TPA rights. Another policy measure that a *Regions and Empires* storyline endorses are long term contracts (also in oil when the current international market would become more 'state' governed). Long term contracts not only secure supplies for a longer period and solidify the producer-consumer relation but also support investments in new oil and gas supplies.

In all this, the reduction of import dependency is an important tool to reduce the vulnerability to disruptions and supply shortfalls. As a result, domestic production will be greatly stimulated and coal and nuclear power generation will play a significant role in the energy mix of consumer countries. Sustainable energies that can be produced domestically will be stimulated for security of supply reasons rather than environmental reasons alone. Much of the Research & Development efforts will be motivated by the propensity to reduce the import dependency or to increase energy system flexibility. Therefore, both storylines could support, for different reasons, the development of clean fossil fuel technologies and sustainable energies, such as decarbonisation of fossil fuels, hydrogen, fuel cell technology and biofuels.

Whilst the prevention tools that aim to establish good relations fit with the *Markets and Institutions* storyline, they are of more limited scope and use in the *Regions and Empire* world. In a *Markets and Institutions* storyline, a business climate must be created in which the market participants are invited to invest in security of supply (delivery) since it is consistent with economic interests. This will allow for more efficient solutions than when arrangements are imposed by national or international institutions. In a *Regions and Empires* storyline, the internal market will be differently organised and the emergence of large integrated companies is more probable. And, to the extent that inter-empire or inter-regional markets have become politicized, this requires the government (national or at the EU level) to set the terms for security of supply more actively. Moreover, the internal market will be more concentrated to a specific area.

6.2.2 Deterrence

The deterrence option is smaller in the *Markets and Institutions* storyline than in the *Regions and Empire* world. In the *Markets and Institutions*, the UN Security Council is the only competent (but nevertheless very effective) tool. Sanctions and peace-keeping interventions will be implemented under UN Security Council decision-making.

In the *Regions and Empires* storyline, unilateral security policy plays a much more important role. The capacity to intervene in key producer regions depends on both the strength of the military forces and the

level of deterrence that the producer countries have themselves or can arrange from competing 'empires'. Thus, contested regions that have not been brought under any one sphere of influence could easily become politically and economically unstable regions. For instance, the Middle East and North Africa have not yet developed a sufficient level of deterrence to reduce the risk of interventions. For this reason, the ambition of certain Persian Gulf countries to hasten the development of a sufficient level of deterrence must be understood in this context. Russia already has a strong deterrence policy, despite the current economic problems to maintain its army. It is worth noting that the strategic position of Russia will be strengthened in a *Regions and Empires* storyline. Another important tool in the *Regions and Empires* storyline is the ability to embark on unilateral political and economic sanctions. The need for security of demand of producer countries can be asymmetric to the security of supply of a certain consumer country and make the producer countries vulnerable for sanctions. The level of structural dependence on gas supplies from Russia and Algeria is large, but the dependence on the potential incremental supplies from the Persian Gulf could be less structural. In a *Regions and Empires* storyline the level of structural import dependence will be a decisive factor in the strength of this tool.

6.2.3 Containment

Containment is a fundamental policy tool in the *Regions and Empires* storyline. In contrast, it is not very relevant for the advanced stage of the *Markets and Institutions* world because different principles govern the international political system and the market. In the *Regions and Empires* storyline, containment policies are crucial as they serve to reduce the potential impact of a supply disruption and shortfall on the domestic economy. As a result, diversification to source and origin, energy system flexibility, energy saving and the stimulation of domestic production are essential tools to reduce the vulnerability of the economy to a disruption of supplies or a shortfall. Diversification not only offers protection from every type of security of supply risk, but it can also be rational from an economic/competitive perspective. In the context of the transformation of the gas market, there are few market-induced drivers for diversification. At the initial stage of *Markets and Institutions* and *Regions and Empires* storylines, government regulators must make use of specific policies in order to achieve the desired levels of diversification. Here, it should be recognised that this may be a relatively low cost option for some countries, and a very high cost one for others, particularly the acceding countries. The level of diversification that can be achieved is also dependent on the availability and the development of bilateral relations with producer countries. Good relations with large oil and gas producing countries could also result in standby arrangement in the event of a disruption or shortfall. For the EU, such an arrangement with Russia or the North African countries would be particularly useful and imaginable (under the already existing policies) in addition to the creation of sufficient storage capacity of oil and gas. Such arrangements with other producer countries are also possible but much more dependent on the level of competition with other 'empires' or on the strategic alliances among 'empires' and regions.

The EU should approach the strategic reserve policy as a strategic energy reserve policy and not approach it on a fuel by fuel basis (strategic oil and gas reserves). More efficient, more flexible and tailor-made choices for member states and their specific energy security needs and their specific dependencies are possible. The EU should develop standards for the level of security of supply and on this basis allow the member states and the industry to address the specific circumstances in a member state or a relevant market. An energy security standard and the ability to create incentives for implementation would allow the member states to show that their energy security is guaranteed by certain policy-meas-

ures, infrastructural provisions and commercial contracts without determining exactly how much oil and/or gas needs to be stored as long as the standard emergency requirement is achieved (which should include the IEA norm). The management of essential demand should be an integral part of such an approach. For instance, member states could opt for more dual-firing capacity and store more oil rather than gas if this provides them with a more optimal solution for their particular risk profile. Particularly in countries where gas storage is complicated and insufficient infrastructure is available to link them with other suppliers or strategic storage facilities this would create the possibility to achieve security of energy supply for the economy. This also allows for more market driven solutions in the (new) member states and it acknowledges the specific circumstances in the different parts of the EU energy market. Such a new approach could imply that if the markets are substantially integrated, function properly and the political risks are deemed low, for instance, the Russian or Algerian production and reserve capacity in fact perform as the strategic reserve of the EU. In such a situation, which conforms with the *Markets and Institutions* storyline or to a specific situation in the *Regions and Empires* storyline, an instruction to EU market players to hold a certain level of commercial flexibility contracts that can facilitate or compensate for losses elsewhere (although additional pipeline capacity is required for this purpose), could achieve energy security of supply. The level of divergence among the various member states' energy systems and the level of exposure to external security of supply risks will continue to exist in the various relevant parts of the EU market. Energy security of supply policies should be functional to present and future demands and allow the market to develop in such a way that the integral priorities of energy policies are met.

6.2.4 Crisis management

As a policy tool, crisis management is not really dependent on the storylines. Interestingly, the only difference is that under the Regions and Empires storyline strategic reserves are built up and used under a domestic or 'empire' regime, rather than under the aegis of the IEA. In the case of the EU, the strategic reserves fall under the provisions of the EU energy policy. The effectiveness of the EU strategic oil reserves is smaller than in the *Markets and Institutions* storyline, where the collective strength of the IEA system creates many benefits. In the more uncertain world of *Regions and Empires,* the lack of solidarity among the IEA member states could imply that the EU must increase the volume of the strategic oil reserves to compensate for the lower effectiveness compared to the IEA system and the growing import dependence. With regard to gas, good relations with Russia and Algeria that include standby arrangements offer more security of supply at a reasonable cost than attempting to build up costly strategic gas reserves. The geological limitations to create storage capacity and the high costs of storing and transporting strategic gas or LNG (several factors higher than oil storage) reserves and the demands on the pipeline infrastructure (in excess of the day-to-day requirements) to facilitate the introduction of strategic gas reserves in the system where they are needed, will surely limit the effectiveness of such a policy option. For countries that only have limited or costly storage options the scope of other arrangements remains limited. The development and implementation of new dual-firing capacity in electricity generation (the duration at which fuel can be switched now is now relatively limited by the technical capacity of the turbines and therefore only offers a short term solution) could be a sensible alternative to strategic gas reserves in those parts of the market where natural gas storage is not possible or excessively expensive. Strategic oil and gas reserves could be blended in a required strategic reserves level that befits the geological, technical and flexibility capability of a country or region. For instance, a country can opt

to increase its strategic oil reserves as a cheaper option or in the case of a gas-rich country, to reduce the strategic oil reserves when Gas-to-Liquids capacity is present in or nearby the economy.

In both storylines, the economic impact of a price increase resulting from a disruption or temporary supply shortfall could be reduced, by implementing a temporary price cap on oil and gas prices. However, if the price is not allowed to express the true demand and supply relation, investments in storage and transportation capacity might be endangered when companies believe that they will not be able to recoup their investments. This would particularly unhinge the operation of the market in the *Markets and Institutions* storyline. In a *Regions and Empires* storyline price and cost are much more related to strategic (foreign and security policy) decisions than market decisions and companies will, very likely, negotiate the terms under which such a policy tool is used. The strategic approach of the international political and economic system will hamper or curb the development of markets and favour negotiated energy trade flows.

The analysis of the available policy tools in the two storylines brings us to the next step in our discussion in which we will analyse the storylines and the available policy tools in relation to the risk of a disruption or a supply shortfall from the vital suppliers to the EU. As noted earlier, the Persian Gulf region is vital for the security of EU oil supply and that a disruption or a supply shortfall, due to underinvestment in the Persian Gulf region, is very hard to compensate from other sources without a substantial negative effect on European economic growth. We also argued that gas supplies from Russia or Algeria are vital to the EU security of supply and that a disruption of gas supplies or a shortfall due to underinvestment would have a similar effect.

In section 6.3.1 we will discuss current uncertainties with regard to the stability of the Persian Gulf and in section 6.3.2 we discuss the possible developments of the Persian Gulf under the two storylines. Then we will examine in section 8.3.3 the different policy options available in the two storylines in case of a disruption or a slowly emerging oil supply shortfall. In section 6.4 we will make a similar analysis for gas.

6.3 The storylines and the Persian Gulf

The greatest risks to the continuity of oil supplies stems from the current troubled situation in the Persian Gulf region. The concerns about security of oil supply have deepened with the unfolding crisis over Iraq.[121] The level of instability of the Persian Gulf is already very high and the risk of a supply shortfall in the short or medium term has increased accordingly. The spill-over effects of the Iraq crisis to the neighbouring countries could be very serious if Iraq cannot be stabilised in the foreseeable future by the occupying forces of the US and UK (See also Annex 1). The problems of Iran and Saudi Arabia in particular are domestic in nature but could be intensified by the problems in Iraq and by the pressure from other countries that defend their vital interests in the Persian Gulf.

[121] Bloomfield, L.P. (ed.), *Global Markets and National Interests*, *the new geopolitics of energy, capital, and infor*

6.3.1 Long standing Instability in the Persian Gulf

The Persian Gulf has been unstable for decades and the regional balance of power has shifted repeatedly. At the origin of many of the conflicts in the Middle East in general, and the Persian Gulf in particular, is the carve-up of the Middle East after the First World War and the collapse of the Ottoman Empire between Great Brittan and France. The Arab-Israeli or Israeli-Palestinian conflict, which led to various armed conflicts in the second part of the 20th century and which has yet to be resolved, is but one of the many consequences of this division that marked another period of empire building. But also the ambition of the Kurds that were left without a nation has resulted in many regional conflicts. The Middle East has since 1918 been contested by various super powers. The oil riches were among the numerous reasons for these powerful countries to challenge each other for influence over the region. For instance, the Middle East, including the Persian Gulf, has been the arena where Cold War politics were intensely fought out.

Until 1953, the UK and the Soviet Union were competing for influence in Iran. After Mossadeq was removed from power in Iran, the US became more involved and brought the country under the American sphere of influence. As a result, Iraq became a new battling ground between the Cold War powers. Attempts to solidify the position of Iraq in the Western camp in the Baghdad Pact failed. Arab nationalism and a battle for leadership of this Arab nation dominated Middle Eastern regional politics in the late 1950s and 1960s. Many countries courted the succession of Iraqi rulers for influence, but in early 1970s prior to the first oil crisis, it was the Soviet Union that prevailed, also in Nasser's Egypt and Syria. In Syria and Iraq, the Arab nationalism led to a strong position of the Ba'ath party. After 1973 and Nasser's death Egypt was lured back in the Western camp. In the early 1970s, the Ba'ath party tightened its grip on Iraq and in 1979 Saddam Hussein took over. Saudi Arabia has been part of the American sphere of influence since the Second World War.

The Iranian revolution of 1979 was a serious challenge to the regional balance of power in the Persian Gulf region. The countries in the Persian Gulf were fearful of a growing challenge to their regimes by oppositional Shiites in their countries that wanted to establish a similar type of regime. Because of the Cold War interests, the significance of the regional aspirations and the subsequent regional power struggle was not always understood. Many times world power and regional power interests found each other. The attack of Iraq on Iran in September 1980 that led to a disastrous war between the two countries until 1988, served the interests of the other countries in the region as much as the American and European interests. The Iranian revolution refocused the attention of the US and some European countries on Iraq. The Islamic revolution needed, in their opinion, to be confined to save the pro-western regimes in the Middle East. Iraq was an important pawn in controlling the Iranian ambitions and defending the western security of oil supply. Yet the Iraq-Iran war also empowered the Iraqi regime in its regional ambitions and became a challenge itself to the ambition and position of Saudi Arabia and Kuwait and the United States. The Gulf war of 1991 was meant to redress this Iraqi challenge to the regional balance of power and the market share oil policy (implying low oil prices) of the Southern Persian Gulf producers.

The lower oil prices since 1985-86 reduced the ability of Iran and Iraq to continue their power struggle and created immense economic problems. The oil policy of Saudi Arabia and Kuwait in particular played an important role in the growing tensions between Iraq and Kuwait. A Saudi attempt to defuse the tension failed and Iraq invaded Kuwait. The inclusion of Kuwait as a new Iraqi province again put the bal-

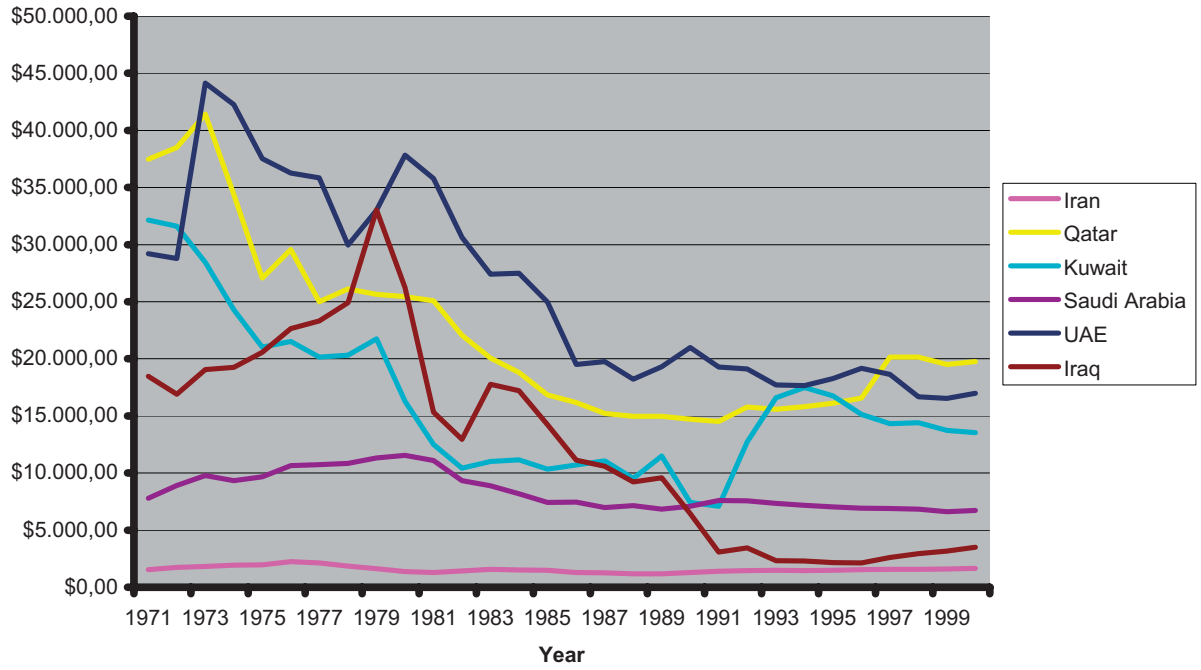
ance of power in the region, OPEC and in the world to the test. Iraq would, if not stopped, challenge the oil market power of Saudi Arabia, because the new Iraq would represent about 20% of world proven oil reserves. Such a change in the balance of power in the region and the oil market was unacceptable to the US and Europe (UK). In the first days after the invasion, in August 1990, Bush sr. and Thatcher, at a meeting in Colorado Springs, declared that such a change in oil market power was unacceptable. A coalition was put together to undo the invasion. After that first response, the oil market was never again used as an argument to intervene in the conflict and instead the sovereignty of the Kuwaiti people was stressed. But, it can be doubted whether a coalition could have been brought together against Iraq if Kuwait had not represented 10% of world oil reserves.

The UN sanctions and demands to remove any non-conventional weapons and any military equipment not necessary for defensive purposes reduced Iraq's regional power. The US and UK policed the no-fly zones for more than a decade to contain the regime's influence and ambitions and as a by-effect, creating the political room for the Kurds to stabilise their society but failing to protect the Iraqi shi'a. The Iraqi shi'a were the victims of the Persian Gulf power struggle and the anti-Iranian position of the US. After the 1991 Gulf war oil prices weakened and remained low until 1999, severely weakening the economies of Iran and Iraq. This supported the balance of power the Americans preferred for the Persian Gulf. However, it proved to be unsustainable when the economies of the other countries on the Persian Gulf, particularly Saudi Arabia, were also weakened.

The European involvement after the 1991 Gulf War was less unified. The UK was firmly involved with the US efforts to contain the ambitions of both Iraq and Iran, and favoured an oil market regulated in conjunction with Saudi Arabia. France initially supported the efforts of the UN to reduce the Iraqi ambitions in the region but changed track after 1995, when it began to favour lifting the sanction regime. In this policy France was supported by China and Russia. France and Russia traditionally had strong links with Iraq. The Iraqi regime was approaching these countries for support for its return in the world community and in return they could re-intensify their economic relations. From 1995 onwards, the Iraqi regime was promising to liberalise its oil industry and indicated it would allow FDI in new oil field developments. France had also secured the offshore Iranian projects when American companies were forced to abandon these when the Iran-Libya sanctions act was implemented. After decades of being closed out of major oil developments, France, and in particular Total, was becoming a key player in the Persian Gulf. France and to a lesser extent Russia and China offered Iran and Iraq a political and economic alternative to the US and thus challenged the American oil, foreign and security policy in the region. The Americans relied more and more on the oil policy of Saudi Arabia alone.

The weakening Saudi economy after the oil price fall of 1998 and the domestic tensions forced Saudi Arabia to change course. The battle between reformers and the religious elite, which had been on-going since the late 1980s, was intensifying when the economy deteriorated rapidly. The GNP per capita (see figure 6.3) had already been declining dramatically for some time, which was partly due to lower oil incomes but also due to very high birth rates. As a result, the flexibility and room for policy-making was declining and Saudi Arabia was forced to address the demographic pressure on the economy.

Figure 6.2 GDP per capita in the Gulf Region, 1971-2000



Source data: IEA. All figures in 1995 USD and exchange rates, without PPP adjustments.

It was clear that Saudi Arabia would have to create an enormous amount of jobs for its young population. In a capital and resource-rich country, the creation of jobs is not easy, particularly when the private sector is not given much room to develop. The domestic difficulties of Saudi Arabia demanded a long term reform of the economy to reduce dependence on oil income, but given the small political room to manoeuvre, they opted for a short-term solution to increase oil income: to increase the oil price with production cuts to buy some time. This ran counter to the market share policy the country had pursued since 1985.

Since 1973 the ability to agree on production levels and price by OPEC member states, the cohesion, has declined because the member states represent dissimilar energy endowments, they experienced asymmetric economic developments and the leading countries in the organization were unable to agree.[122] Since 1999 cohesion has been stronger again, particularly compared to the situation in the late 1980s and 1990s, because of the formulation of a price band between $22-28 per barrel that represents the desired price range among the leading member states. The lack of spare capacity in many of the OPEC member states, due to difficulties to raise investment capital inside the state sector and the inability (for political or economic reasons) to raise capital in the international market, and the income needs of most governments determines the fairly high price range that the countries agreed on since that time. The danger of prolonged higher prices is that investments in non-OPEC countries are attractive again, inviting new competition in the market plus alternative sources of energy.

[122] Van der Linde, *Op. cit.*, 1991, pp. 20-28.

In March 1999, Saudi Arabia reduced oil output in the OPEC framework. The production cuts had the support from Mexico, Norway and also Russia. The subsequent sudden price increase came at the peak of the American business cycle. The US became more concerned about the changing relations in the Gulf region. The new Saudi policy also helped to bring some fresh capital to Iraq and Iran. The American protests about the high oil prices and the diplomatic pressure to increase production confirmed the opinion of certain groups in the Gulf that the domestic economic problems were not the first priority for the US. The response of the European countries was also seen as unconstructive. The OPEC countries had been involved in intense discussions about the Kyoto Protocol and feared a further increase of the tax burden on oil products. After the (environmental) taxes and levies had yielded sizable state revenues over the 1990s, the European governments were not prepared to consider a temporary reduction of the tax levels when high crude oil prices were beginning to encumber the economy. Both the US and EU governments showed their inconsideration with the economic hardship in the Gulf countries when they were unprepared to share the political and economic burden. Since then, the unease about the poor economic performance of the Arab economies and the closed political systems has grown.[123]

The recent period of relatively high oil prices delay the badly needed economic and political reforms in many of the OPEC countries. Since the late 1980s, FDI and the right of foreign oil companies to own equity again has been discussed but no real regime change has taken place. Iran's offshore oil production was opened for FDI, and Kuwait has followed with offering some offshore blocks. Algeria allowed foreign firms in its gas industry. Saddam Hussein offered some onshore blocks to foreign investors to bring in fresh capital after the sanctions would be lifted. And now, given the enormous reconstruction that the Iraqi oil industry requires, opening up the country for FDI seems the only solution to raise sufficient capital. The reluctance of the major oil producing countries to allow FDI is mainly political in nature. It has to do with the fact that foreign oil companies owning equity reduce the state's control over oil production and, thus, over pricing via collective decision-making within OPEC. In addition however, allowing foreign oil companies to come back is feared for the popular response in these countries, as it would be considered as a failure of government that it could not profitably run the industry.

Currently, FDI in the gas industry seems to generate less popular opposition in the region. The capital requirement for setting up an exporting natural gas industry is far beyond the investment capacity of the producer countries. In July 2003, also Saudi Arabia made a long expected breakthrough by entering into a gas exploration and production contract. Private companies will explore for gas in the Empty Quarter (Rub al Khali).

The opposition in Saudi Arabia is predominantly Islamic and the current government feels it has to move with some caution to introduce political and economic reforms. In Iran, the opposition to the government is a movement aiming to reduce the grip of the religious leaders on the country and to make space for the necessary political and economic reforms. The countries around the Persian Gulf share the tremendous demographic pressure on their political and economic systems. The growth of the population in the 1990s in Iran, Saudi Arabia but also Iraq make it very difficult for the government to stabilise GDP per capita at an acceptable level. Already, these countries have witnessed a serious fall in welfare and the

[123] United Nations Development Programme, *The Arab Human Development Report 2002*, New York: UNDP, 2002

pressure to raise oil revenues is great. With regard to the assessment of the geopolitical risks to the security of oil supply the dangers have become a short-term problem for the consumer countries that rely heavily on Persian Gulf imports.

6.3.2 Storylines and stability in the Persian Gulf

Let us pause for a moment and discuss the relevance of the previous consideration of the storylines developed in the previous chapter, where we concluded that the level of uncertainty or risk with regard to the Persian Gulf was insensitive to the storyline because the exposure to the risk occurs now and not somewhere in the future. Whilst the Persian Gulf has been unstable for a long time, the region, nevertheless, has been able throughout this period to produce sufficient oil to supply international markets. This should warn us for the potential impact of geopolitical instability on energy supplies. Producer countries have become very dependent on oil and/or gas incomes and this reduces the ability to vary energy flows. However, the political and economic instability could reduce the output potential of the countries in a period when the call on OPEC oil will increase.

The diversification policies of the consumer countries in the 1970s and 1980s and the investment strategies of the international oil companies have produced enough supplies from alternative sources to effectively create a buyers market in the 1980s and 1990s. From the perspective of the oil consumer countries, the instability of the Persian Gulf, during the past 20 years, did not fundamentally challenge their security of supply. Moreover, there has been ample intervention on the part of consumer countries to meddle in the balance of power in the region to make sure that oil kept flowing.

In the *Markets and Institutions* context, we can assume that more private capital will be allowed to flow into the Persian Gulf countries to both finance oil and gas production capacity additions (see figure 6.3). The competition for oil will be among private companies and the risks of the instability of the Persian Gulf will be predominantly private capital risks. Accordingly, a re-integration of the value chain of oil, which includes the oil assets of the Persian Gulf, could prevent a supply shortfall to occur for other reasons than the normal business and investment cycle. To go further, international institutions will be used to mediate the political differences among the countries (for instance in the Israeli-Palestinian conflict). The role of government will be mainly to manage that sufficient spare capacity is developed for the system and to guard the implementation of depletion policies. The role of OPEC will be mainly one of information sharing and governance. OPEC, like the IEA, facilitates discussions in the International Energy Forum (IEF) where outstanding issues among producing and consuming countries are discussed and coordinated. In *Regions and Empires* context, it is arguable that private capital might still play an important role. We can expect, however, that the competition among countries or ‘empires’ will determine the access to resources and the exposure to risks. In the latter storyline, the Persian Gulf will become an even more hotly contested region and stability will not be easily established unless the region is firmly placed in a sphere of influence of one, or two, of the contenders.

Figure 6.3 EU policy options in case of Persian Gulf Uncertainty

Risk	Policy Tools	Regions and Empires	Markets and Institutions
Persian Gulf Stable: no/low supply shortfall	Prevention	• Arrange alliances to gain access to resources of the Persian Gulf • Promote bilateral trade agreements with GCC and Iran • Promote FDI	• Underpin peace process Middle East • International co-operation (IEF, IEA, WTO etc.) • Encourage liberalisation and privatisation of oil and gas
Persian Gulf Uncertain: supply shortfall possible	Prevention Containment Deterrence	• Unilateral political and economic sanctions • Encourage investments elsewhere to fill supply shortfall • EU should develop independent security option	• UN economic sanctions • Diversification: encourage investments elsewhere • Support UN policies • Vertical and horizontal integration of companies
Persian Gulf in disorder: no or small output	Containment Crisis Management	• Diversification, but no ability to completely fill large supply shortfall • National or regional crisis management: strategic reserves: only temporary relief • Domestic energy production	• Demand mangement • National policies and IEA crisis management, such as strategic reserves: only temporary relief • Sanctions and peace-keeping under UN Security Council decision-making

From a long term perspective, the stability in the Persian Gulf remains bleak, although the risk for continued instability is smaller in a *Markets and Institutions* approach than in a *Regions and Empires* approach. In the latter case, consumer country competition will add to the local and regional tensions. So, the type of political and economic problems that Iran and Saudi Arabia are currently experiencing will persist, even when the situation in Iraq has become more stable. It may be the case that a successful re-integration of Iraq in the international political and economic system actually will increase the pressure to reform in the two neighbouring countries.

6.3.3 Persian Gulf instability and the EU policy space

For Europe, the probability of establishing some level of control over the Persian Gulf, other than offering special economic relations, is rather low. For Europe, with its integration project still underway, the first best option emerges in the *Markets and Institutions* storyline, in which unconditional access to the EU market offers the Persian Gulf security of demand. Fundamentally, the *Markets and Institutions* storyline fits the design of the EU itself and therefore requires no new ideology to improve relations with other regions and nations. The market is employed as the means to create interdependencies that economically and politically benefit the participants, and institutions are there to coordinate the interdependencies. Complex conflicts of interest and policy-style can be resolved, in part, on the market, instead of in the sensitive diplomatic and policy arenas. In contrast, the *Regions and Empires* storyline requires the

EU to become much more of a political project than it is now. For instance, it would mandate the formation of a credible European military threat, including the political willingness to use this threat to actively defend European energy interests. This, in turn, requires a close connection between energy policy formation and EU foreign and security policy making, and European policy makers must be convinced of the interests at stake. Such a development should not be expected in the near future.

With regard to the current situation in Iraq, the fragmentation of Europe among different policy lines merits our attention. A lack of cohesion among the European member states effectively removes the deterrence policy tools.[124] In the present circumstances, the EU member states are unable to formulate a common foreign and security policy towards the Persian Gulf. The effect of economic sanctions, for instance, is small to begin with, let alone when they are not supported by a wider group of countries. Also, if internal differences of opinion hamper the formulation of a joint position of the EU member states, it certainly impedes EU co-operation at a higher level of collaboration in the UN and leaves the door wide open for national approaches of the member states. This unduly weakens the position of the EU in the international political and economic system. In a more co-operative world, like the *Markets and Institutions* storyline, the room to slowly integrate politically in an implicit way is much larger than in the *Regions and Empires* world, which requires explicit political integration.

We can see that the window of opportunity to arrange for new energy security policies or to sharpen old ones - before the Persian Gulf situation further deteriorates and results in a supply disruption or a supply shortfall has become very small indeed. The concerns have also grown beyond the mere energy security concerns, and any policy initiative will more likely involve the wider foreign and security concerns (although the specific energy concerns should be an integral part of the policy-making). In the short term, we must, therefore, rely on the efficacy of the containment and crisis management policies that are already in place.

Changes in the international political and economic system usually take place at a more gradual and sustained rate than most advocates imagine. Although we attach a certain value to a major event that appears to have suddenly triggered developments in a certain (or new) direction, such as the oil crisis of 1973 or the attacks on New York and Washington D.C. on 9/11/2001, reality is different. More often than not, a major event substantiates the subtle changes and underlying developments of previous period. In the case of the recent political crisis over Iraq in the UN Security Council, the inability to agree on a joint approach within the UN context was as much based on shifting approaches to the international political and economic system in the last decade, as a response to the issue of Iraqi non-compliance itself. This new approach would appear to converge with the *Region and Empires* storyline. Although this change of course is not unequivocal and could possibly be reversed when counter forces gain prominence, such a development is not very likely and would require, in our opinion, a rather dramatic shift in the current approach from the main players in the US, EU, Russia and China.

[124] See Figure 6.1.

6.4 The storylines, Russia and Algeria

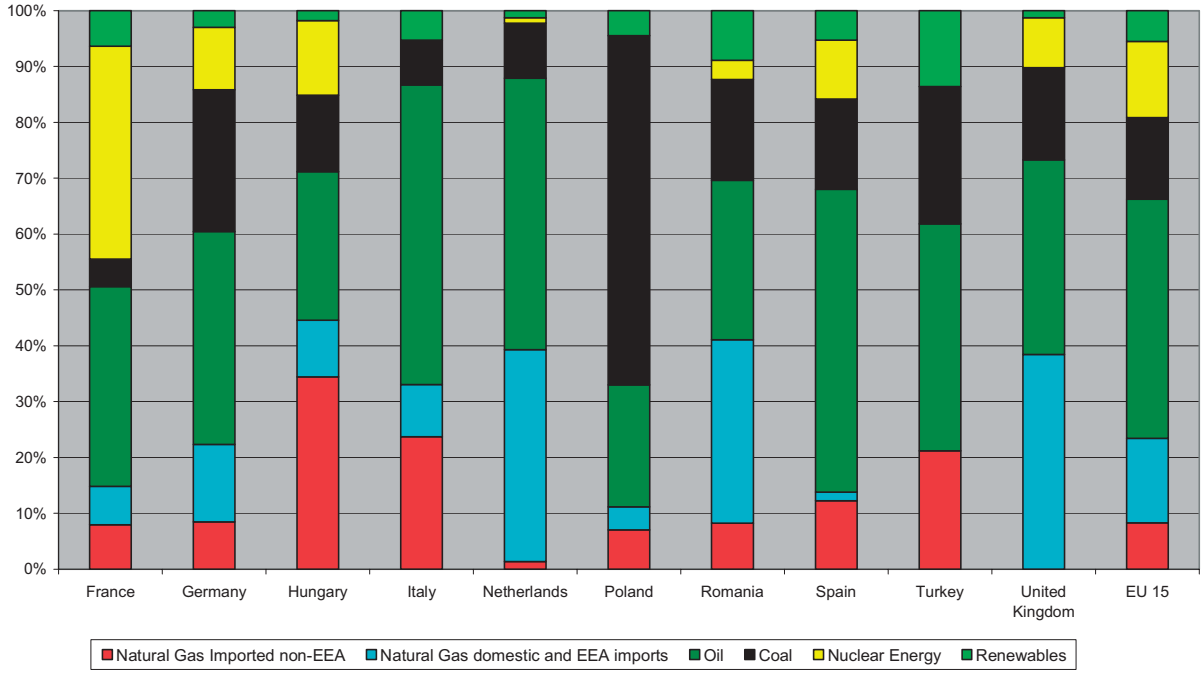
In the past, the stability of natural gas supplies has been much greater than oil supplies, despite the fact that the largest supplier of the EU went through a dramatic process of state disintegration from the Soviet Union into the CIS. The political and economic system change in Russia, where most of the gas supplies originated from, was very large indeed. Russia introduced democracy and market reforms, which implied a gradual liberalisation and privatisation of the economy. Although domestic oil and natural gas prices in Russia have not been fully adjusted to world market prices yet and the transition process is far from complete, the change in the economy is dramatic. Yet the flow of natural gas to the EU remained undisturbed helped by the fact that the entity that organised these flows, Gazprom, survived the system change intact and managed to honour the export contracts. The importance of the natural gas export income for the transition process to succeed also helped to maintain the flows.

Algeria, also a vital supplier of natural gas to the EU, has for the last 10 years experienced a turbulent period in which political and economic stability was fragile. In 1992, the army cancelled the elections to prevent FIS from establishing an Islamic republic (see also Annex 1). In the years after, the loss of life in what can be called a civil war was tremendous. Currently, the situation appears more stable than that of the early 1990s, but the secularist army and the Islamists remain opposed. In terms of gas flows, Algeria managed to maintain its natural gas supplies throughout the period, with the state company Sonatrach in control of the flows.

The continued flow of gas is important because gas supplies cannot easily and timely be replaced with supplies from elsewhere. The flow of natural gas is dedicated to the pipeline or LNG infrastructure. There is no world market for natural gas: gas is essentially traded in three separate consumer markets in North America, the EU and Asia. The markets in North America and the EU are pre-dominantly based on pipeline gas, while the market in Asia is a LNG market. The dedication to the available gas infrastructure and the different levels of dependence on imported gas implies a rather wide variety in the vulnerability to supply disruptions and/or shortfalls among the EU member states. However, the dependency on (imported) gas is generally lower than for oil (see figure 6.3) Countries such as the UK, the Netherlands, and Denmark are largely self-sufficient, while others such as Spain, Portugal, Greece, Finland and Austria are largely dependent on a single supplying third country. Currently, there is no international consumer country agreement on natural gas, which is comparable to the IEA crisis framework. As a result of the discussions about the Green Paper (2000), a new draft directive of the EU on the security of supply was discussed among the member states that proposed the compulsory storage of gas. The concerns about the future security of natural gas supply (or LNG) arise from the dominant position of particularly Russia and Algeria in the different geographical parts of the EU internal gas market and the limited possibilities to diversify. In many of the accession countries, dependence on Russian supplies is large and expanding.[125]

[125] See figure Annex 4 no. 17.

Figure 6.4 Primary energy supply of selected countries



Figures based on BP Statistical Review of World Energy, June 2003, IEA Renewables Information 2003.

6.4.1 The internal gas market

In addition to the concerns over the future stability of natural gas supplies, we indicated in Annex 4 that the process of implementing the internal gas market is a source of instability itself.[126] We argued that the liberalisation process itself creates investment uncertainty for the producer countries and that this could cause a supply shortfall in the next decade.

Liberalisation will erode existing security arrangements. This can manifest itself in various respects:

- Even a partial transition from reliance on long term contracts to short term arrangements amplifies the exposure to a reduction in natural gas supplies, if these supplies are re-directed to other export markets or to the internal market of Russia;
- The strategic stocks presently kept in France and Italy will not be maintained if they are transferred to commercial companies, because they constitute a significant economic burden in a competitive market;
- In a liberalised market where prices are set in hubs, the structural diversity, created by national companies purchasing from different sources and averaging the costs of supply, is likely to come under commercial pressure.
- Transport capacity may be a problem, as dedicated pipelines do not allow for much flexibility and idle spare capacity won't be available anymore.

[126] See Annex 4 section 5.1.

Liberalisation has been a largely internal process, and supplier countries were not involved in the decision-making process. In fact, the EU actively tried to harmonise its new internal policies with those of the supplier countries by proposing that these countries would adopt similar policies. The unilateral nature of the EU liberalisation process has created concerns on the part of the supplier countries that the European decision would be prejudiced against their specific interests. The EU approach of Russia was rather insensitive to the Russian needs and created resistance in the Russian administration. Consequently, the EU had to face the fact that it could not convince Russia to ratify the Energy Charter - initially a bilateral initiative, not unlike the *Regions and Empires* approach, but very quickly turned into a weaker multilateral initiative by other consumer countries; the Kyoto Protocol - an inherent multilateral initiative; and the WTO agreements. Moreover, the results of the Putin-Prodi talks on energy appear bleak in comparison to the US-Russian Energy talks, where one successful initiative to co-operate follows the other. The insistence on Russian gas market reforms, the discussion of the position of long-term contracts and the destination clause has seriously delayed progress in EU-Russian energy co-operation. In the meantime, oil export capacity is developed to increase oil deliveries to the US and plans are investigated to develop LNG export facilities to deliver gas in the American market.

The myopic approach of gas market liberalisation in the EU did not recognise the growing importance of imported natural gas supplies, although the level of import dependency varies among the European countries, and the interests of the producer countries (see figure 6.4). The response of the producer countries, which would concur with a *Regions and Empires* development, might be totally opposite to the intention of the EU policy-makers and might be regretted later when producers decide to collude. It is worth pointing to the observation of Odell: "Liberal ideology, of course, presumes a competitive gas supply system. This however leads to the exposure of the producers with respect to the viability of their upstream investments, given both the long lead-time for the development of production capabilities and the high volume of investments required for securing the required economies of scale in the associated transmission systems. Under such conditions, arising as a necessary consequence of the free-market structure demanded by the EU Gas Directive, there will be a powerful motivation for suppliers' collusion. (…) Such possible developments would, of course, not only be adverse for the anticipated Eurogas market, but they would also be more generally disadvantageous for Europe's economy."[127] The gas purchases of Russia in the Caspian Sea region for re-export to the EU iluustrate the strategy in which Russia tries to control as much supply as possible; a strategy that is optimal in the current uncertain investment climate. However, in the eyes of the European gas community these supplies were supposed to enter the EU natural gas market in addition to Russian supplies and satisfy part of the growing demand for gas.

The EU approach of Russia is concurrent with the *Markets and Institutions* approach that comports neatly with the EU liberalisation project. Indeed, the mistake on the part of the EU was that Russia is not ready for such far-reaching reforms. The gradual approach of Russia to its transition process did not allow for such a bold move to de-monopolise, liberalise and privatise the Russian gas market at such short notice. In the *Markets and Institutions* storyline such a move on the part of Russia would eventu-

[127] Peter Odell, European Gas: Prospects, in: Correljé, A., Van der Linde, C., Westerwoudt, T., *Natural Gas in the Netherlands, From cooperation to Competition?*, Oranje-Nassau Groep/CIEP, Amsterdam/The Hague, 2003, p. 143.

ally become inevitable when its economy continued to grow and integrate ever deeper in the world economy. Intensified international energy co-operation would deliver the necessary confidence in the market process. The EU perhaps underestimated the Russian awareness of its political and energy market strength after the break-up of the Soviet Union. For a long time, the EU saw itself as the only logical marketplace for Russian natural gas and discussed energy matters from this, by hindsight, flawed perception. Russia is able, in the new gas market circumstances, to create alternative markets for its gas. Although these markets are small compared to the domestic gas market and the EU gas market, the existence of alternatives should reinforce the focus of the EU to secure the Russian supplies for the future. Strategic energy cooperation with Russia would be a recommended strategy in the *Regions and Empires* storyline, but could also be a stepping stone for the type of Russian-EU integrated natural gas market in a *Market and Institutions* approach. Regardless of the storyline, additional volumes of Russian gas are not going to arrive in the EU without a stimulus to expand investments in new production and transmission capacity. Ultimately, long term contracts should provide the type of security which investors in the Russian gas sector require to bring this gas on stream.

6.4.2 Instability in supplier countries

The geopolitical risks of gas supply fall into two categories: first, the risk of an immediate supply disruption; and second, the risks of inadequate future supplies to meet EU demand. In both instances, the EU must rely predominantly on its ability to manage its relationship with Russia and Algeria. Measures to prevent and contain failures of other non-EEA suppliers to deliver gas are less critical than those relating to supplies from Russia and Algeria and this will continue to be the case for the future. LNG supplies will grow considerably but will not be able to keep pace with the expected growth in demand. Therefore the gas supplies from Russia and Algeria are also expected to grow (see also Annex 1). In the *Markets and Institutions* storyline, the market will easily absorb and produce the growing supplies. Normal economic and investment cycles determine the tightness of the supply and demand. Market access is matched with access to resources and companies from producer and consumer countries alike will be active in the market. In the *Regions and Empires* storyline, bilateral co-operation with both Russia and Algeria is crucial. Both countries will insist that their interests are realized in such a bilateral relationship.

In both storylines, the position of Russia is strong (see figure 6.5). In the *Markets and Institutions* storyline, Russia is predicted to expand its economic growth and develop into a vibrant economic power. This assumption is supported by a recent Goldman Sachs study.[128] Russia has the advantage of being an energy-rich country that can sustain growing domestic energy needs and exports. In the *Regions and Empires* storyline, the position of Russia as an energy-rich country becomes even more important. The other regions that compete for dominance are energy-poor and will have to rely substantially on an instable Persian Gulf for their energy supplies. Russia also is a substantial supplier of oil and can grow into an even more important alternative supplier than it is today. A strategic alliance with Russia will be sought after by many of the world main powers. Irrespective of the storyline, in the short term, Russia

[128] Wilson, D., Purushothaman, R., "Dreaming with BRICs: the Path to 2050", *Goldman Sachs Global Economics Paper*, Vol. 99, 2003, pp 2.

has a shared interest in a stable energy relation with the EU. This common interest may change when Russia becomes less dependent on the incomes of natural gas exports and domestic energy needs take preference.

Figure 6.5 Schematic presentation of EU policy tools and Russia

Risk	Policy Tools	Regions and Empires	Markets and Institutions
EU Stable, Russia Stable	Prevention	• Encourage investments • Arrange strategic alliance • Vertical integration/FDI • intensify bilateral commercial relations	• Encourage deeper economic integration; • encourage liberalisation • Foreign policy • intensify commercial relations
EU incomplete internal market Russia in Transition	Prevention Containment	• few possibilities to diversify away from Russian gas • instable investment climate; invest elsewhere and LNG. • operational storage capacity	• few possibilities to diversify away from Russian gas • mobilise capital for investments.
	Deterrence	• no credible deterrence; Russia has WMD, import dependency high	• UN action impossible: Russia has VETO Power
EU incomplete internal market, Russia in Stable	Prevention Containment	• create certainty about implementation period of internal gas market and its outcome • create demand certainty (long term contracts) • FDI from Russia • respond to Russian diplomatic efforts to stabilise	• create certainty about implementation period of internal gas market and its outcome • create demand certainty (long term contracts) • Forward Integration • respond to Russian diplomatic efforts to stabilise
EU Stable, Russia Uncertain	Prevention Containment	• few possibilities to diversify away from Russian gas • investment gap in Russia growing due to lack of stable investment climate and finance.	• few possibilities to diversify away from Russian gas • investment gap in Russia growing due to lack of stable investment climate and finance.
	Deterrence	• no credible (military) threat available; Russia has WMD	• UN action impossible: Russia has VETO Power

Algeria, as the second most important EU supplier from outside the EEA, has also a shared interest in a stable energy relationship with the EU (see figure 6.6). The stability of the relationship with Algeria, however, is dependent on the development of the internal political situation. The impact of Middle East politics on stability in Algeria and/or the possibility of an Islamic resurgence, inspired by similar developments elsewhere in the Middle East or North Africa, can sway the domestic political balance.[129] Again,

in a *Markets and Institutions* storyline, stability is easier to preserve and the ability to create more local benefits of Algeria's energy exports will help to integrate the country in the world community (see figure 6.3). In a *Regions and Empires* storyline, the stability of Algeria is less certain although not as uncertain as the Persian Gulf. The proximity to the EU and the distance to the Persian Gulf could help to bring Algeria strongly in the EU region. In the absence of other contenders for influence, the stability of Algeria and its energy exports could be fairly strong.

In the context of geo-political risks to gas supplies, the future instability focuses mainly on the area around the Persian Gulf and to a lesser extent the Caspian Sea Region. While the size of the oil flow from these regions is substantial, the natural gas supplies to Europe are virtually non-existent. The development of the natural gas flow from these regions to the EU will depend on the ability to manage the accompanying security of supply risks and on the competition for supplies by other potential consumers in Asia and the US.

[129] See Annex 1.

Figure 6.6 Schematic presentation of EU policy tools and Algeria

Risk	Policy Tools	Regions and Empires	Markets and Institutions
EU Stable, Algeria Stable	Prevention	• Integrate Algeria in EU-led region and strengthen political and economic ties in MENA; • no supply/investment gap • intensify bilateral commercial	• Encourage relations Algeria • Encourage liberalisation energy sector • International co-operation • Intensify commercial relations
EU in Transition, Algeria Uncertain	Prevention Containment	• Diversify away from Algerian gas • Encourage investments elsewhere • LNG • Standby arrangements • Create stable market circumstances	• Diversification to source • Foreign policy • Storage • Energy saving • Create stable market circumstances
	Deterrence	• Unilateral economic sanctions • Security policy	• UN action possible
EU in Transition, Algeria Stable	Prevention Containment	• Create certainty about implementation period of internal gas market and its outcome • Create demand certainty (long term contracts) • Respond to Algerian diplomatic efforts to stabilise	• Create certainty about implementation period of internal gas market and its outcome • Create demand certainty (long term contracts) • Respond to Algerian diplomatic efforts to stabilise
EU Stable, Algeria Uncertain	Prevention Containment	• encourage investments elsewhere but few possibilities to diversify away from Algerian gas • bilateral co-operation to stabilise investment climate	• few possibilities to diversify away from Algerian gas • encourage investments • foreign policy • International co-operation
	Deterrence	• Unilateral economic sanctions • EU Security policy	• UN action possible

6.5 Conclusion

As we have shown, the perspective on the level security of EU oil and gas supply differs widely between the two storylines. Moreover, the effect of EU policy tools also varies widely. For the realisation of the security of supply of oil, much will depend on the stability of the Persian Gulf. The probability of stability in this region is not very high, although somewhat better in an advanced stage of the *Markets and Institutions* storyline. The region has a long tradition of instability. The current political and economic problems and the expected intensifying consumer country competition for control over the oil flows make the prospect of stability small. Considering the external energy dependency of the EU and given the internal market, it may be that the EU has no other alternative but to develop a coherent energy security policy that addresses the current asymmetry in exposure among the member states.

The energy security policy tools available to the EU can be subdivided into tools that aim at: prevention, deterrence, containment and crisis management. In addition to traditional energy policies, such as strategic reserves, external trade and foreign and security policy are also a crucial part of the energy security toolset. Energy policy is further greatly impacted by environmental policies and *vice versa.* The growing interrelationship between internal energy markets, energy security of supply, foreign relations and the environment (see also Greenpaper COM 769 final, 2000), and the long-term consistency of policy-making, requires a more and more integral approach of energy matters. In order to determine the vital energy interests of the EU internal policy co-ordination at the EU level is warranted.

The EU should determine its vital energy interests and correlate these interests to the relevant policy areas to allow for the development of a coherent and consistent integral approach (following the approach developed in the greenpaper). The EU should also determine the robustness of its energy systems. To this end, the EU should make an inventory of policy measures and the rigor of implementation based on coherence and consistency or the lack thereof concerning the internal energy market policies, environmental policies, energy security policies and foreign and security policies. In this inventory, infrastructure and other technical and operational aspects and the management of the systems should also be taken into account in order to clarify the weaknesses in the energy system of the EU. Another important inventory should be made of essential demand and demand switching possibilities. Such an integral inventory can encourage the development of a coherent energy security policy.

Pricing CO_2 emissions might run counter to diversification policy. Under such circumstances, diversification might conflict with the policy to reduce greenhouse gas emissions, unless clean technologies can be introduced. For some countries, however, diversification may appear desirable. Nuclear power may satisfy the need to diversify and at the same time reduce the import dependency and limit the emission of greenhouse gases. The current plans to dismantle nuclear capacity will begin to have a seriously impact on the EU generating capacity from 2015 onwards. At the moment, nuclear power is not generally accepted by large parts of the European public due to the problem of nuclear waste disposal. However, alternatives for nuclear power might be very hard to find in the short run without further increasing the import dependency, because the contribution of more sustainable energy will only slowly increase

The transatlantic relationship has always incorporated energy security for the EU, but has slowed down the EU from creating independent policies. Energy should be recognized as a main consideration in the

EU-US relationship. Also there is some justification to consider whether the current tensions between the EU and US serves the EU's energy interests. This may require asking whether the EU can act in a manner that allows it to follow through the consequences of an independent policy. If the answer is that the EU needs more time to put together the capacity to act more independent from the US, the efforts in re-building the Trans-Atlantic relationship should necessarily become larger. If the answer is that the capacity to follow through the consequences of an independent EU policy is large enough, more independent relationships with producer countries could become an option. A more independent approach on the part of the EU could be seen as running against the US vital interests. The American interpretation of such a EU approach will depend on the quality of the bilateral relations. In a strong Trans-Atlantic relationship a more independent EU course in energy could strengthen the American security of supply when such a course would make more oil and gas available to the international market. In the present geopolitical circumstances, the relations should be open for cooperation.

EU security of supply would greatly benefit from the further development of the multilateral producer-consumer cooperation in the International Energy Forum (IEF) and, at the same time, the EU should intensify the bilateral integration initiatives with Russia and other neighbouring producing, such as in North Africa, and transit countries. In addition to the multilateral co-operation in the IEF and IEA, bilateral cooperation and dialogue with other important consumer countries, particularly China, Japan and India in order to ensure as much as possible a common approach concerning stability at the global oil and gas markets and global warming.

The advantage of forging strong energy relations with Russia is that the EU can offer energy saving technologies to reduce the energy costs in the Russian economy, production technologies and gas use technologies. In addition, the EU offers alevel of security of demand that no other market can easily offer. If Russia reasserts its influence over the Caspian Sea region, the danger of Persian Gulf problems spilling over might be somewhat reduced and oil and gas flows from this region will be enabled to reach various markets. For the gas producing countries, it is important that clarity is created with regard to the liberalisation process of the European gas market. As we have seen, long term contracts are an important condition for Russia and the other gas suppliers to the EU market to mobilise sufficient capital in new production capacities. Domestic gas demand in Russia will be an important factor in the volumes of gas that are available for export, while the income stream from exports of gas are an important ingredient in financing the gas production projects. The structural dependence on large volumes of gas imports from Russia and Algeria should be reflected in EU energy policy-making. Russia is still in a process of transition and domestic institution building. The reduced capacity to adjust to changes in the EU energy market should be taken into account. Finally, with regard to Algeria, but also the other North African producers, it is important to assist them in strengthening domestic political and economic stability.

The two storylines were developed with different geopolitical futures and energy security outcomes for the period until 2020. There were significant differences in the storylines which warrant distinct policy approaches. Since the future will not develop strictly along these pre-dominantly energy driven storylines and the fact that other interests will also drive the EU external policies, indicates that the EU would benefit by keeping its (energy) policy options open. Hence, the EU should not commit itself to such a dedicated policy route that an effective future response to a different geopolitical environment is possible. This in turn should, in the short run, encourage policies that take account of this need for flexibili-

ty; e.g. look for intensified international cooperation and for the strategic interests of the EU.. It appears sensible to hedge for a less multilateral centred world in the coming years. Similarly, this may well result in EU policymaking that takes into account the pursuance of national or regional vital energy interests of other prominent political and economic powers. To this end, the EU should proceed to develop a clearer understanding of its own vital interests, in the medium and long term, and what is required to serve these interests. It is sensible and prudent to assume that the market alone will not suffice and that many of the benefits associated with the exchange process could be provided by properly costed regulation. Therefore it is reasonable to anticipate a greater use of external trade and foreign and security policymaking as an important energy security of supply policy tool.

7

Main Conclusion and Policy Recommendations

7.1 Conclusion

The main result of this study on *EU Energy Supply Security and Geopolitics* is that energy must become an integral part of EU external trade and foreign and security policy-making. EU foreign and security policy and external trade policy are crucial energy policy tools to achieve future security of supply. The recommendation to include energy issues more prominently in external trade and foreign and security policy-making is based on the fact that the dependency on imported energies will increase substantially in the coming decades (COM 769 final, 2000) and that the uninterrupted flow of energy will mainly depend on the political and economic stability of the producer regions. Even though this study has focussed on geopolitical issues from a predominantly energy perspective and that other important issues of external trade and foreign and security policy have not been directly analysed, the conclusion is nevertheless that energy will greatly determine foreign relations in the future.

Overall, security of energy supply is of vital interest to the member states. If security of supply is or becomes uncertain (for some or all member states) or the level of security is asymmetric among the member states, the urge to implement national energy security policy by certain member states, to guarantee these supplies, might well become stronger. However, due to the integration and liberalisation of the EU energy markets, the scope for national policies to ensure adequate levels of security of their own has decreased significantly. To the extent that member states find it necessary to forge national security of supply policies at the level of national foreign policy-making, this strategy to deal with supply concerns will not only interfere with EU energy policies but could have negative effects on the development of EU foreign and security policies. Considering the external energy dependency of the EU and given the internal market, it may be that the EU has no other alternative but to develop a coherent energy security policy that addresses the current asymmetry in exposure among the member states.

The EU is a project that is fundamentally embedded in the multilateral post-1945 world system. Any weakening of multilateralism will strongly impact the environment in which EU enlargement and the deepening of integration can take place. In a less multilateral oriented world system, the EU can be expected to change from an economically driven project into a political-strategic driven project. This does not mean to say that a re-orientation of the EU to a political-strategic project is in conflict with a multilateral world order. Howevver, when such a re-orientation must take place under the mounting external pressure of a less multilateral oriented geopolitical system rather than as a result of internal choices, the EU member states might find that the time frame to realise such a re-orientation does not fit the usually long process of consulations and could therefore create new complications and unpredictable contingencies. Under the circumstances, it is altogether possible, given the wide divergence in political-strategic issues among the member states and the difficulty in the EU to address the power question that the political-strategic project may not succeed. Notably absence of a common direction in polit-

ical-strategic issues could jeopardise the formulation of an EU security of energy supply policy and fuel the preference for national approaches.

Due to the growing energy import dependency of other main consumer regions, such as the US, India, China and other Asian countries, energy relations will become increasingly politicised. In other consumer countries, energy security will also become a more integral part of foreign and security policy-making. Competition among consumer countries for energy supplies is likely to become more intense than in the previous two decades. The changed circumstance will necessarily have an impact on the international economic and political relations in the world.

In the past decades, the Trans-Atlantic relationship has been of great importance in EU-Middle East relations, and has left little room for an independent EU approach (for instance the1970s Euro-Arab Dialogue). The energy interests of the US are a primary factor why the independent approach of the EU has not received much support in the US. In recent years, the fate of the Energy Charter has been similar to earlier initiatives towards energy producing countries. The current Charter is a much-diluted measure compared to the initial plan to build and to strengthen the European-CIS energy relationship. The promotion of the long term energy interests of the EU is imporant and can coincide with stronger relations with neighbouring countries and/or regions. For instance, North Africa, the Persian Gulf, the Caspian Sea region and Russia are neighbouring regions of the enlarged EU and are all economies that are, some more than others, important trading partners. With the east and southward shifting borders of the EU, the external trade and foreign and security policy of the EU will certainly be influenced by enlargement; in particular by the possible enlargement with Turkey, which would create direct borders with Iran and Iraq. There is clearly room for neighbouring countries or regions to integrate their markets with the EU. Consequently, the EU could, as a part of its (energy) policy-making strategy, facilitate a deeper integration of markets.

EU external trade policy and foreign and security policy will be instrumental in securing an uninterrupted supply of oil and gas by underpinning the political and economic stability in producer countries and maintaining good relations with these countries. Security of demand is of vital interest to the producer countries, which has to be acknowledged. A coherent and well co-ordinated EU approach in producer-consumer relations is an important precondition to achieve an acceptable level of energy supply security.

As a consequence of the geopolitical developments in the period to 2020, the probability of events affecting the energy security of supply and the exposure of the EU (to the vulnerability of society to risks) is likely to increase. In addition to traditional energy policies, such as strategic reserves, foreign and security policy should also be seen as crucial element of the energy security toolset. The effectiveness of the policy tools depends not only on the ability to employ domestic energy assets, technical and operational factors, transportation and import facilities, investment climate and the availability of foreign oil and gas supplies, but also on the geopolitical setting in which these policies must perform. Given the dynamic developments in the international political and economic relations, a static approach to energy security does not suffice.

Energy supply security therefore requires a dynamic external trade and foreign and security policy towards North Africa, the Persian Gulf, the Caspian Sea region and Russia. Moreover, the EU policies

should be focussed on political and economic sustainability in producer regions/countries to guarantee the long term security of supply of oil and gas. For this reason, stability in North Africa and the Persian Gulf must be seen in the wider context of stability in the Middle East and in Central Eurasia. Given the current level and kind of instability in these regions, the realisation of a more stable situation will take time.

Sustainable prosperity in the neighbouring oil and gas producing regions will also help the general security situation of the larger EU, particularly when these countries/regions can also attain better domestic political accountability and develop proper governance systems. The EU should make efforts to assist these countries in overcoming their current political and economic difficulties. Existing policy efforts towards the Magreb, Mashrak and Eurasian countries could be intensified to create mutually beneficial and good economic and political relations (see also (Com 262, Communication from the Commission to the Council and the European Parliament on the development of Energy Policy for the enlarged European Union, its neighbours and partner countries, 2003). Such relations would not only greatly benefit the southern and eastern EU member states, but the entire EU.

Relations with Russia should be strengthened and reflect the economic and political importance and the already existing interdependence between the EU and Russia. In time, Russia could become a member of the European Economic Area (EEA) or a specially created other economic agreement that reflects the integration of the Euro-Russian markets in general and energy markets in particular.

The stability of the oil market depends on the ability and willingness of OPEC to meet demand at a reasonable price and on the availability of spare capacity that can compensate for any temporary production losses or meet sudden demand increases. Because there was sufficient spare capacity available, the world has been able to cope with depressed supplies from Iran since 1979 and temporary losses of Iraqi supplies in the 1980s, 1990s and 2003. In the past ten years, spare capacity has been declining and is increasingly concentrated in Saudi Arabia. The stability of the oil market increasingly depends on the willingness of the Saudi government to create spare capacity and to make this capacity available to the market when needed to stabilise prices. ‘The need of the market’ has been an important subject of discussion between producer and consumer countries. Periods of consensus about what the price and production level should be, have alternated with periods of disputes on the distribution of economic rents (when prices were either too high or too low) among producer and consumer countries. Economic vulnerability to oil price changes and security of supply on the part of consumer countries and income needs of producer countries continue to represent opposite interests in the international oil market.

In the last couple of years, price volatility has become an additional issue for consumers and producers alike. Asymmetric interests in a certain level of production and price among the players in the oil value chain has undermined oil market stability. Given the distribution of reserves and the potential future production capacity in the Persian Gulf countries, the domestic economic pressures in the producer countries will become a more and more forceful driver of oil policies and could potentially undermine a cooperative oil policy among main producer countries.

The present uncertain political and economic climate in the Persian Gulf and the expenditure needs of the government on the non-oil sector of the economy has created a situation in which the capacity to

invest in new production and transportation facilities has declined. The reluctance to allow foreign direct investments (FDI) in the oil sector could create a supply gap in the period to 2010. In the gas sector, FDI is allowed, but the economics of the projects (which includes the investment climate and the political risk) have so far limited the investments.

As was pointed out, the security of supply in oil largely depends on the stability of the Persian Gulf. The availability of spare capacity is very important for the future operation of the international oil market. Alternatively, the size, availability and the rules of employment of strategic oil reserves by consuming countries is important for producing countries. Co-operation among producers and consumer countries e.g. through the International Energy Forum (IEF) could facilitate the reliability of oil market management. Although the strength of the fundamental differences over rent distribution should not be underestimated, the common interest to stabilise markets is also strong.

The potential level of exposure to an oil supply disruption increases when international co-operation is not optimal and political and economic instability in the main producer countries persists. The concentration of reserves and potential additional supply capacity in the Persian Gulf increases the structural dependency on these countries. Alternative supplies from Russia and Africa could offer some degree of diversification of oil supplies, but cannot compensate for a substantial disruption originating in the Persian Gulf.

The dependence of the EU on large volumes of imported pipeline gas from Russia and Algeria creates a high level of structural dependence. A disruption of supplies or a slowly emerging supply shortfall in these countries could jeopardise the EU security of supply, unless supplies from elsewhere could make up the gap. A growing capacity to receive gas in the form of LNG allows for some diversification, but to quickly shift supplies from the two main suppliers to LNG is hardly feasible. The limited availability of large commercially viable LNG sources and the cost competitiveness of pipeline gas will focus LNG supplies predominantly in the southern European gas market, where pipeline gas from Russia and Norway cannot compete. The pace of expansion of LNG capacity in the wider EU market depends on the investment conditions for re-gasification terminals, the contractual basis to support the investments along the supply chain and the investment criteria in the producing country. The lack of substantial volumes of domestically produced gas in the EU and the subsequent reliance on large volumes of imported gas, either in the form of LNG supplies or through long distance commercial pipelines, requires an investment climate that helps bring these projects on stream. Despite the projected expansion of EU gas demand in the period to 2020, the capital intensity of these investment projects require more precise information on the timing and the relevant markets and size of this expansion to realise the flows to the European market. To manage these information and timing risks, supplying companies in producing countries will seek to contract the flows in each stage along the gas value chain to realise the new capacities. The asymmetry in the drivers for gas demand and supply could create a bottleneck for the liberalised gas market that requires supportive government policy to undo. As long as demand drives supply because the risk of capacity additions in LNG and pipeline projects needs to be managed, the development of spot markets and gas-to-gas competition will be slow. From a security of supply point of view, the EU should in the short and medium term make sure that new and diversified gas supplies can arrive in the market. In the longer term, a more diversified flow of LNG and pipeline gas will help the full realisation of a liberalised gas market.

Even though the Middle East has vast gas resources, there are significant obstacles that make it difficult, in the short to medium term to generate significant increase in supplies. Moreover, the investment climate in the Middle East is not much better than in Russia and the Caspian Sea Region and external capital needs to be mobilised to realise the LNG projects. Nevertheless, projects are underway for Persian Gulf LNG exports to Asia, Europe and other markets and more plans are on the drwaing board. Also in the Persian Gulf, the timing of the investments to fill up the expected supply shortfall is crucial. Yet the Persian Gulf supplies are mainly incremental supplies and unless security of supply is assured, these supplies will remain modest.

7.2 Main policy recommendations

The energy security policy tools available to the EU can be subdivided into tools that aim at: prevention, deterrence, containment and crisis management. In addition to traditional energy policies, such as strategic reserves, external trade and foreign and security policy are also a crucial part of the energy security toolset. Energy policy is further greatly impacted by environmental policies and *vice versa.* The growing interrelationship between internal energy markets, energy security of supply, foreign relations and the environment (see also Greenpaper COM 769 final, 2000), and the long-term consistency of policy-making, requires a more and more integral approach of energy matters. In order to determine the vital energy interests of the EU internal policy co-ordination at the EU level is warranted.

The EU should determine its vital energy interests and correlate these interests to the relevant policy areas to allow for the development of a coherent and consistent integral approach (following the approach developed in the greenpaper). The EU should also determine the robustness of its energy systems. To this end, the EU should make an inventory of policy measures and the rigor of implementation based on coherence and consistency or the lack thereof concerning the internal energy market policies, environmental policies, energy security policies and foreign and security policies. In this inventory, infrastructure and other technical and operational aspects and the management of the systems should also be taken into account in order to clarify the weaknesses in the energy system of the EU. Another important inventory should be made of essential demand and demand switching possibilities. Such an integral inventory can encourage the development of a coherent energy security policy.

EU security of supply would greatly benefit from the further development of the multilateral producer-consumer cooperation in the International Energy Forum (IEF) and, at the same time, the EU should intensify the bilateral integration initiatives with Russia and other neighbouring producing, such as in North Africa, and transit countries.

In addition to the multilateral co-operation in the IEF and IEA, bilateral cooperation and dialogue with other important consumer countries, particularly the United States, China, Japan and India in order to ensure as much as possible a common approach concerning stability at the global oil and gas markets and global warming.

The EU should approach the strategic reserve policy as a strategic energy reserve policy and not approach it on a fuel by fuel basis (strategic oil and gas reserves). More efficient, more flexible and tailor-made choices for member states and their specific energy security needs and their specific dependencies are possible. The EU should develop standards for the level of security of supply and on this basis

allow the member states and the industry to address the specific circumstances in a member state or a relevant market. An energy security standard and the ability to create incentives for implementation would allow the member states to show that their energy security is guaranteed by certain policy-measures, infrastructural provisions and commercial contracts without determining exactly how much oil and/or gas needs to be stored as long as the standard emergency requirement is achieved (which should include the IEA norm). The management of essential demand should be an integral part of such an approach. For instance, member states could opt for more dual-firing capacity and store more oil rather than gas if this provides them with a more optimal solution for their particular risk profile. Particularly in countries where gas storage is complicated and insufficient infrastructure is available to link them with other suppliers or strategic storage facilities this would create the possibility to achieve security of energy supply for the economy. This also allows for more market driven solutions in the (new) member states and it acknowledges the specific circumstances in the different parts of the EU energy market.

The extent of the energy security standards depend on the completion of the internal energy market and the level of integration with the energy markets of for instance Russia, Algeria or other countries. The adoption of a flexible approach could, in turn, imply that if the markets are substantially integrated, function properly and the political risks are deemed low, then the Russian or Algerian production and reserve capacity could, fore example, perform the strategic reserve function of the EU. In such a situation, which conforms with the *Markets and Institutions* storyline or to a specific situation in the *Regions and Empires* storyline, an instruction to EU market players to hold a certain level of commercial flexibility contracts that can facilitate or compensate for losses elsewhere (although additional pipeline capacity is required for this purpose), could achieve energy security of supply. The level of divergence among the various member states' energy systems and the level of exposure to external security of supply risks will continue to exist in the various relevant parts of the EU market. Energy security of supply policies should be functional to present and future demands and allow the market to develop in such a way that the integral priorities of energy policies are met.

The impact of geopolitical changes on EU energy security is different when the internal market is complete. If the market is not complete a certain level of re-focussing of energy policy could occur. Also, the ability to integrate the Russian energy market in the EU market improves when the internal energy market is complete, although certain Russian needs to make the integration successful should be addressed. If the internal energy market is not complete, the scope of government involvement should be larger in order to encourage market integration with Russia. In the event market integration with Russia cannot be achieved or when Russia poses a security of supply risk itself (low probability in the study), more domestic energy security measures will be necessary (including strategic reserves somewhere in the EU energy system) because the contractors cannot fully count on additional emergency deliveries.

Under the present geopolitical circumstances, the EU should keep its foreign and security and energy policy options open in order to facilitate a proper response in the event of a political calamity. Also, the transition to a more sustainable energy system should be part of the long term security of supply policy-making, particularly when the call on imported energies can be reduced as a result. Similarly, the continuation of the EU research and technological development activities in the field of nuclear electricity generation and waste disposal is necessary. In general, the field of international relations and energy, including security of energy supply, should be actively developed for policy-making purposes.

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Annex 1

Producer States

Central Eurasia, the Caspian Region and Russia

The Persian Gulf States, Turkey and the Maghreb

Venezuela

West African producer states

1 Central Eurasia, the Caspian Region and Russia

1.1 Introduction

The Caspian littoral states[130] together hold one of the world's largest oil and gas reserves, making them very significant to global markets. The proven and possible estimates of oil and gas reserves in the Caspian region vary. For example, according to the *Statistical Review of World Energy,*[131] the total proven oil reserves of the Caspian littoral states were estimated at 153.8 billion barrels in 2001, and its total proven gas reserves at 2688.3 trillion cubic feet (tcf). Energy consultant Wood Mackenzie has estimated that the five Caspian littoral countries (including only the Caspian off-shore sector of Russia and Iran) will have the potential to produce about 4 million barrels per day (mbbl/d) by 2014.[132] If the various oil projects boost production, then the Caspian region's oil exports might rise to 3 mbbl/d by 2010, and an additional 2 mbbl/d to 5 mbbl/d in 2020.[133] At today's market prices, the potential oil reserves of the Caspian Sea zone have an estimated value of 2USD – 4USD trillion.

Oil and gas resources in the CEA region engender both co-operation and conflict between states of the immediate and highly interested regional powers (China, Iran, Russia, and Turkey), the Western countries, especially the United States (US), the European Union (EU – and its member countries), and non-state actors Transnational Corporations (TNCs), organised criminal groups, organised radical Islamist groups, and non-Governmental Organisations (NGOs).[134] How might the geopolitics of these state and non-state actors affect energy security in CEA?

1.2 State actors

Tapping into CEA and Caspian oil and gas reserves has turned the region into an arena of serious rivalry between both state and non-state actors. Different political and economic aims as well as different historical backgrounds have resulted in various forms of strategic co-operation, but have also led to competition amongst the interested countries and TNOCs. What are the interests and policies of the main state actors involved in CEA?

1.2.1 The United States and Central Eurasia, the Caspian Region

For the US, access to energy resources has always been a major strategic interest. The US is determined to secure a dominant role not only in the Persian Gulf but also within CEA. The main challenge for US policy-makers is to balance commercial and security interests, and foreign policy goals in CEA. In this

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130 Central Eurasia comprises Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) and the South Caucasus (Armenia, Azerbaijan, Georgia). When speaking of the Caspian region we mean he five littoral states (Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan) if not noted otherwise.

131 BP, *Statistical review of world energy 2002*, June, 2002, on-line version.

132 McCutcheon, H., Osborn, R., 'Risks temper Caspian rewards potential', *Oil & Gas Journal*, December 24, 2001.

133 EIA, *Caspian Sea Region*, (February, 2002), on-line version.

134 Amineh, M.P., *Globalisation, Geopolitics and Energy Security in Central Eurasia and the Caspian region,* The Hague: CIEP, 2003.

vein, a major concern is to break Russia's dominant position in general, and its control over oil and gas resources and transport routes, in particular and to prevent Iran from gaining influence in the region.

The US is a great supporter of the Baku-Tbilisi-Ceyhan (BTC) and the Trans-Caspian Gas Pipeline (TCGP) as they both circumvent Iran as well as Russia. However, both are very costly projects (see below, 1.3.2.1) and there are great objections made by TNOCs regarding construction of these pipelines. Two Washington-based independent research groups, the Carnegie Endowment for International Peace and the Cato Institute, have criticised economic justifications for the Baku-Ceyhan route. Consideration of Russian and Iranian alternatives have been urged, but the Bush administration appears determined to follow its own strategy. Rather than to co-operate with TNOCs the US Department of State has pressured TNOCs to invest in pipelines they do not want thus suiting the US government's geopolitical convenience more than the oil companies' interests. The competing alternatives, namely the Supsa, Novorossiysk and Iranian routes (see below, 1.3.2.1), are still viable alternatives. An important factor is that of the eight oil companies comprising BTC's sponsoring group, Azerbaijan's SOCAR and Turkish Petroleum Corporation (TPAO) unequivocally back the Baku-Ceyhan project, while the others have their objections.

In its determination to undermine Russian influence in CEA and the Caspian region, the US also encourages establishing regional arrangements that exclude Russia, such as the GUUAM (consisting of Georgia, Ukraine, Uzbekistan, Azerbaijan and Moldova). The history of GUUAM is one of increasing formalisation and deepening integration of an opposition bloc within the Commonwealth of Independent States (CIS). The September 11th attacks on the US provided an added incentive for using Afghanistan and later Iraq as convenient targets to remind the world of the US's capacity for military destruction. Since September 11th the US has also been rapidly building up its military presence in CEA. The policy-makers of the CEA republics, in their eagerness to accommodate US forces, have different motives for encouraging US troop deployments. To understand such co-operation with the US one has to take into account the fact that for a decade CEA states have faced the threat of Islamist radicalism, terrorism and drug trafficking. All of these states have identified these issues as primary security threats, and Afghanistan as the locus of these threats. The objective of US policy-makers is not only to obtain oil and gas from CEA but also to control the flow to oil and gas markets in the West and in Southeast Asia. US economic interests are combined with strategic interests to weaken Russian and Iranian influence in the region and also to ensure better control over both resources and the shipping lanes in the Persian Gulf. Rivalries that are played out here will have a great impact on the shaping of post-Soviet CEA, resulting also in world-wide consequences. For example, increased US influence in the region poses an immediate threat to both Russia and China, and also to Iran.[135]

1.2.2 Russia and Central Eurasia, the Caspian Region

Russia remains the most prominent regional power in CEA and tries to reincorporate the region into its security system as can be illustrated with its aim to establish a unified air defence system in the context of the CIS. For Russia, the CIS provides the possibility of reviving the former security, political and economic Soviet order within a new political constellation. Another attempt at regional co-operation is the

[135] Amineh, *Op. cit.*, 2003, Ch. 6.

Eurasian Economic Community (EAEC – Belarus, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan) whose main objective is deepening co-operation for economic and humanitarian fields.

As a major energy producer and transit country, Russia's role is of paramount importance for global oil and gas markets. Russia's proven oil reserves are estimated at 48.6 billion bbl of oil (seventh largest in the world) and proven gas reserves at 1680.0 tcf (largest in the world). The Russian oil production in 2001 was estimated at 7.29 mbbl/d. Russia views its influence in CEA as a precondition for profiting the most from the export of its own oil and especially gas resources.

While in most Western countries private companies can influence (to a certain extent) foreign policy, Russian companies must follow what the political leadership considers to be its national interest. However, as we have seen above, the Russian national interest is not so clearly defined among the Russian political élite. Each ministry, region, administration and individual has its own political agenda. This is particularly so for the country's foreign policy. Disputes between the different ministries and lack of co-ordination have prevented major Russian oil companies from developing a lucrative business around the Caspian Sea.

When the multi-billion dollar AIOC oil deal was signed in September 1994, with the Russian oil company LUKoil as signatory with a ten percent share, the Russian Foreign Ministry held an official news conference to condemn the deal as illegitimate, while a representative of the Russian Energy Ministry participated in the signing ceremony. In June 1994, the Russian Foreign Ministry claimed that with regards to the legal status of the Caspian Sea, the treaties of 1921 and 1940 between Russia / Soviet Union and Persia / Iran would still be in force. This meant that the Caspian Sea's resources should be developed in common (see 1.3.1.1). This came at a time when LUKoil already had been granted a stake in the Chirag and Azeri fields and was negotiating to develop Güneshli and Kyapaz, as well as when the Azeri parliament still had to approve LUKoil's participation in the development of Azerbaijan's oil resources. LUKoil appealed to the Fuel and Energy Minister Yuri Shafranik and to Prime Minister Viktor Chernomyrdin who was unaware of this Foreign Ministry move. Chernomyrdin could not do anything more that to state that this was a "lack of co-ordination" between the two ministries. LUKoil's ambitious expansion since 1992 has been successful despite the behaviour of some segments of the Russian political élite. LUKoil's spokesman stated in 1997, "Oil corporations act […] ahead of most others Russian political actors, therefore generating a new political system."[136] And according to a Russian commentator: "It is not the Russian government that defends the interests of the national companies on foreign markets but, on the contrary, the big firms that often make the life of the diplomats easier."[137] Vagit Alekperov, the chairman of LUKoil admitted that he found it more difficult to work in the former Soviet Union and particularly in Russia than in other countries.[138]

Russia therefore stands in clear opposition to any export pipeline that would not pass through its territory. Russia transports its oil through the North Caspian Pipeline route from Tengiz through Astrakhan,

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136 Pappe, Y., 'Neftyanaya I gazovaya diplomatiya Rossii', *Pro et Contra,* Vol. 2, no. 3, Summer, 1997.

137 'Gosdep SchA Ugrozhayet Gazpromu', *Nezavisimaya Gazerta,* October 17, 1997.

138 'Neftyanoi 'sprut' Vagit Alekperov', *Argumenty I Fakty,* no. 50, December 1997.

Komsomolskaya and Tikhoretsk to the port at Novorossiysk. It has a length of 1,580 km with an initial capacity of 560,000 bbl/d, and ultimately is expected to handle 1.5 mbbl/d. In June 2002 it was moving 240,000 bbl/d. Shipment of oil through the North Caspian Pipeline to the Black Sea and then to Italy will cost $1.74 per bbl. – more than $1 cheaper than transport through the BTC pipeline.[139]

Another major pipeline project is the Russian Turkish undersea Blue Stream pipeline, also a rival to the US supported TCGP. With a maximum of 2150 m below the Black Sea the Blue Stream pipeline will be the deepest in underwater pipelines. Any damage during operation would involve expensive repair and a cutting-off of gas supplies, and further would incur great ecological consequences (see below, 1.3.2.1 and 1.3.4). Interestingly, Moscow opposed the construction of the TCGP for ecological reasons but has no such concerns for the Blue Stream pipeline. Russia sees its influence threatened by an increasing US involvement in the region, particularly NATO's eastward enlargement, the US-NATO-supported GUUAM and recent bilateral military agreements with CEA governments.

To counter-balance concerted efforts by the US to achieve both dominance in the region, as well as some kind of the world leadership, Russia has entered into a number of strategic alliances with regional powers, especially Iran and China. Russia delivers weapons, military technology and also assists in the building of Iran's nuclear field in Busher. With China it co-operates not only in different bilateral political, economic and security terms but also in the context of the Shanghai Co-operation Organisation (SCO). As all of the Central Asian states (except for Turkmenistan) already belong to the SCO, this could be viewed as a direct attempt to reduce the rationale for a Western security presence in the region.[140]

On May 28th, 2003 China and Russia signed an agreement for the construction of a 2,400 km pipeline from Russia's Siberian oilfield to the Chinese City of Daqing. The costs are estimated at $2.5 billion. The Russian firm Yukos and the China National Petroleum Corporation (CNPC) back this pipeline. It is agreed that between 2005 and 2030, CNPC will purchase 5.13 billion bbl of Russian oil worth some $150 billion.[141] Another pipeline under discussion would pump up to 1.6 mbbl/d from oil fields near the shores of Lake Baikal, north of Mongolia to Nakhodka and then to Japan. It would cost $5.2 billion and have a length of 3,800 km. The Russian state-run oil firm, Rosneft, and Japan back this pipeline. The project would give Russian oil companies a major boost in export capacity and strengthen Russia's position as oil deliverer to the Asia-Pacific region.[142]

1.2.3 China and Central Eurasia, the Caspian Region

Beginning in 1991 China has emerged as a potential player in CEA. China has a booming economy and is currently the world's third largest oil consumer. In 2000 China's oil consumption was 4.78 mbbl/d and

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[139] Berniker M., 'Caspian Pipeline Powers Kazakhstan's Oil Export', *Eurasia Insight,* February 25, 2002, on-line version; Burke J., 'CPC Pipeline can handle more than Tengiz Oil', *Eurasia Insight,* October 16, 2001, on-line version.

[140] Amineh, *Op. cit*., 2003, Ch. 4.

[141] "China and Russia Ink Oil Pipeline Agreement', May 29th, 2003, on-line version, http://www.china.org.cn

[142] AGOC, 'Moscow plans to develop new markets', *News and Trends E & SE Asia,* Vol. 8, no. 8, April 17 2003, on-line version.

is expected to reach 10.5 mbbl/d by 2020. Because of the wide gap between domestic oil and gas production and demand, China will become increasingly dependent on the import of oil and gas. China views Caspian energy as a source of future supply. The region's resources are attractive for the country both in terms of security and petroleum supply. Until recently China considered itself to be a passive observer of the Great Game in CEA, however, it has now manoeuvred itself onto the centre-stage of the region's energy politics by obtaining several stakes in major oil and gas deals. In 1997 China and Kazakhstan signed a number of agreements for the exploitation of Kazakh's oil reserves. CNPC bought a 60 percent share in Kazakh Oil Company, Aktobermunaigaz, developing on-shore oil deposits in the Aktyubinsk oil field in western Kazakhstan. During the same year, CNPC decided to build a $3.5 billion, 3,000 km pipeline linking Aktyubinsk in western Kazakhstan with the Xinjiang region in China.[143] It estimated that the pipeline would transport 400,000 bbl/d with a possible increase to 800,000 bbl/d. Feasibility studies were halted in September 1999 because Kazakhstan was not able to commit sufficient oil flows for the next ten years. Currently, Kazakhstan supplies China with 50,000 bbl/d by rail.[144] The deal between CNPC and Kazakh Aktobermunaigaz combines both China's national security concerns as well as the ambitions of China's oil companies. Pipeline construction will create jobs in Xinjiang and give China leverage to persuade its CEA neighbours to not provide support for the Xinjiang separatist movement. If the Iranian and Turkmen governments agree, this pipeline will be extended through Turkmenistan to Iran.[145]

The security environment since the end of the Cold War has afforded China opportunity to focus on economic development. According to Chinese rhetoric, world politics is in transition from a bi-polar to a multi-polar world structure. Nevertheless, Chinese analysts fear that the US as a prominent economic, political, and military power could pose a threat to China's interests. China's response to US politics since 1992 has been one of good-neighbour policy. This policy entails improving relations with other countries especially those bordering China. According to James Hsiung the good-neighbour policy is "an attempt to operationalise the idea of a 'collegial sharing of power among nations' to counter the threat of a uni-polar world."[146] China strives for a broad network of secure regional and global relationships that could offer alternative sources to the US for trade, technology, investment and international political support. China's relations with Russia and CEA must be considered in this context.

The institutionalisation of Chinese-Russian relations works well and these relations are deepening with Russia's support of the Chinese armed forces in a substantial modernisation of equipment. Both China and Russia are viewed as problematic by the US, and reciprocally China and Russia consider NATO enlargement, extension of security agreements with Japan, and activities in CEA, as a planned pincer movement on the Euro-Asia land, directed against Russian and Chinese interests. This has led to co-oper-

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143 Walker, T., Corzine, R., 'China Buys $4.3bn Kazakh Oil Stake, *Financial Times,* June 5, 1997, p. 9.

144 Soligo, R., Jaffe, A.M., 'China's Growing Energy Dependence: The Costs and Policy Implications of Supply Alternatives', *Baker Institute Working Paper,* April 1999, on-line version; EIA, *Kazakhstan-Country Analysis Brief*, July 2002, on-line version.

145 'Chinese, Kazak Leaders Sign Pipeline, Economic Accords', *Moscow Interfax,* June 27, 1997.

146 Hsiung, J., 'China's Omni-Drectional Diplomacy: Realignment to Cope with Monopolar US Power', *Asian Survey,* Vol. 35, no. 6, June, 1995, p. 575.

ation at least in medium-term against Western interests. In a longer-term perspective, China could become a rival to Russian interests in CEA because it does not like Russian dominance in general, and because CEA countries seeking to avoid Russian influence could find it more comfortable to lean towards China, which has no apparent intention of singular dominance.

China's domestic stability is threatened by the separatist movement in its Xinjiang Uighur Autonomous Region. Because of the high concentration of an ethnic minority population the Chinese leadership views the Xinjiang region as particularly susceptible to foreign anti-Chinese influences. It fears that the radical Islamist and separatist forces operating in CEA could stir up separatist aspirations of minority groups in China. Stability in Xinjiang is important to China for various reasons. Instability in Xinjiang could undermine China's control of the region and thus threaten the integrity of the country as a whole. The region has vast open spaces and a relatively small population making it perfect for nuclear testing and large-scale conventional military exercises of the People's Liberation Army. Xinjiang is a significant domestic source of oil and gas. Bordering Mongolia, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Pakistan and India, the region is an important springboard for China to strengthen its influence on other countries.[147] This was also of course the backdrop for earlier Chinese initiatives in fighting terrorism in Central, West and South Asia. Much attention was given to the fight against terrorism long before the attack on the World Trade Centre. It should not surprise us that China and the US have different views regarding which states sponsor terrorism. China may be forced to expand its role by strengthening its links with Iran, still listed as a member of the US defined "axis of evil".

1.2.4 Iran and Central Eurasia, the Caspian Region

Some see Iran as the most attractive export route for Caspian oil and gas. Iran is the world's second largest power in proven natural gas reserves (estimated at 812.3 tcf) after Russia and ranks fifth in proven oil resources (8.5 percent, estimated at more than 89.7 billion bbl).[148] Iran is the OPEC's second largest oil producer. Its output quota within the OPEC currently stands at 3.18 mbbl/d. Its actual production is close to 3.6 mbbl/d. On Monday July 14th 2003, Abol-Hasan Khamooshi, head of the Iranian Ministry of Petrol, Engineering and Development Company, told the Kayhan newspaper that recently Iran has discovered three oilfields with more than 38 billion barrels of oil: "In our preliminary estimates, we found out that in Koh-Mond oil field there are 6.63 billion barrels, in Zageh 1.3 billion barrels and in Firdows 30.6 billion barrels of oil, situated around Busher [bordering the Persian Gulf]."[149]

Iran's gas reserves are stored in 117 oil and gas fields either as independent fields or as gas layers in oil wells. About 50 percent of the natural gas fields have not yet been developed meaning that Iran has potential to produce even more natural gas. The South Pars gas field is the world largest and is jointly shared with Qatar. Iran has nine refineries with an approximate capacity of 1.5 mbbl/d the oldest and largest of which being the Abadan Refinery with a nominal capacity of 420,000 bbl/d.[150] It already has

147 Amineh, *Op. cit*., 2003, Ch. 5.

148 BP, *Op. cit*., 2002.

149 *Kayhan,* July 14, 2003.

150 'A Brief History of Iran Oil and Petroleum Industry', *Mash'al,* publication of Oil Ministry, no. 183, September 2000, pp. 30-32.

a well-developed pipeline infrastructure. Most TNOCs argue that constructing pipelines through Iran or linking them to already existing pipelines to the Persian Gulf would be much cheaper than the proposed pipelines for the east-west corridor. To transport oil and gas through Iran to world markets would cost no more than $1 billion to complete existing pipelines and related infrastructure.

The Persian Gulf is also a good exit point from which to serve the Asian market. The route increases the world's reliance on the Strait of Hormuz. The idea is to swap Azeri and Turkmen gas exported to Iran's northern refining centres at Tabriz, Tehran and Arak for exports of Iranian oil from Iran's main Persian Gulf terminal at Kharg Island. The advantages are that Iran's already existing pipeline system could be used for this project. It is estimated that the maximum swaps could amount to 400,000 to 500,000 bbl/d. According to information by industry and local officials, Malaysia's Petronas and China's CNPC are interested in investment in an Iranian route. This route could transport their own future Caspian production and they could generate transit fees from other producers when US sanctions are lifted.

Turkmenistan and Iran signed a 25-year contract when Turkmenistan opened the 124-mile gas pipeline linking the Korpeze gas field in western Turkmenistan to the town of Kord-Kui in northern Iran in December 1997. The $190 million pipeline has a length of 198.4 km. In 2001 it exported 154 bcf with an expected peak capacity of 282 bcf/y. According to the 25-year contract between the two countries, Iran will take between 177 bcf and 212 bcf of natural gas from Turkmenistan annually. 35 percent of Turkmen supplies will be allocated as payment for Iran's contribution to building the pipeline. The presidents of Turkmenistan and Armenia reached an agreement in December 2001 according to which Turkmenistan will supply up to 70.6 bcf/y of natural gas to Armenia via the Korpezhe-Kord-Kui pipeline and across Iran. The implementation of this deal is contingent on the construction of an already long-delayed Iran-Armenia natural gas pipeline. The deal on this pipeline was signed between Iran and Armenia in December 2001 at a cost of about $120 million.

A strategic project of the Iranian government and TotalFinaElf is the construction of a pipeline from Baku in Azerbaijan via Tabriz in Iran to the Iranian Caspian coast at Neka. It will have a length of 560 km and a probable capacity of 200,000 to 400,000 bbl/d. The costs are estimated at $500 million.

Iran hopes to extend its domestic pipeline network with the construction of a pipeline from Neka to the refinery Rey. This would link the refinery network with the inland pipeline system. The aim is to take Turkmen, Kazakh and Azeri crude to the Iranian northern refineries near major population centres, delivering in return an equal amount of Iranian crude from the Gulf. The proposed $360 million pipeline link is expected to have an initial throughput of 175,000 bbl/d. After construction of the second phase, the throughput can be increased to 370,000 bbl/d. This project will be subsidised by China's state company (Sinopec), and CNPC as well as the Hong Kong firm, Federal Asia. CNPC and the Iranian Oil Ministry have failed to reach an agreement on the joint construction of the crude oil pipeline, a CNPC official stated. Also the Swiss-based trading house Vitol is said to be close to winning a deal to arrange the financial backing for the pipeline, according to a company official – which they also hope to sign imminently. The consortium would provide $130 million of the capital. Crude oil swaps from Kazakhstan and Turkmenistan through Iran are expected to increase five-fold to 120,000 bbl/d by the end of 2002 and could quickly rise to around 370,000 bbl/d as has been projected by the President of the Swiss based trading-house Vitol. Oil companies have discovered that the Iranian route is a quick and cheap solution,

but one that is hampered by the US sanctions prohibiting trade with Iran. Iran takes Caspian oil through the port of Neka for its northern refineries in exchange for Iran's Persian Gulf oil. Vitol backed by BNP Paribas has put together a $150 million pre-finance package to fund the construction work on the Neka terminal and two refineries. China Petroleum & Chemical Corp. (Sinopec), will participate in the construction of the port facilities at Neka and expansion of the Tehran and Tabriz refineries. By December 2002 the Neka terminal is projected to have a capacity of 370,000 bbl/d. The pipeline from Neka to the refinery Rey will have an initial capacity of 120,000 bbl/d increasing to 370,000 bbl/d within six months. Iran charges a swap fee of $16 per ton for Turkmen and $13 per ton for Kazakh oil.[151] Iran's active role in the oil and gas market and to become an active player in international affairs is hampered by a number of problems, e.g. the sanctions imposed on Iran by the US (see below, 2.2).

The European countries' policy toward Iran differs from that of the US. EU engagement with Iran is considered necessary for bolstering Khatami's reformist government. European leaders have stated that they would oppose military action against countries the US has identified as within the "axis of evil". In the case of Iraq, however, there was no common position for EU member countries, as France and Germany openly rejected, while Britain actively supported the war. On June 17th 2002, the EU gave the green light to launch formal trade relations with Iran, despite heavy pressure against this from the US. The major EU aim is to provide backing for the reformist faction under President Mohammad Khatami. This could increase European advantage over US counterparts. The EU is Iran's main trading partner. In 2000, imports from Iran totalled €8 billion, more than 80 percent of which consisted of oil products. Exports to Iran amounted to €5.2 billion. US TNOCs have argued that US unilateral sanctions give their European rivals an unfair advantage.

Iran's influence in the production and export of CEA oil and gas resources is also hampered to a great extent by the not yet settled dispute concerning the legal regime of the Caspian Sea. Since Russia, Azerbaijan, Kazakhstan and Turkmenistan have agreed that the Caspian Sea should be divided into national sectors on a bilateral basis, Iran stands alone in its position on the division of the Caspian Sea. It still demands the continued validity of the 1921 and 1940 contracts, or a division of the Caspian Sea into equal sectors with a share of 20 percent of the seabed for Iran. Still, Iran and Russia see common interests for co-operation. Both countries have long borders with CEA as well as historic, cultural and ethnic ties. Civil war in CEA will easily involve Iran and Russia in terms of refugees, arms and extremist ideologies. They also fear the consequences of instability in Afghanistan for their own internal affairs. Both Iran and Russia provided military support to the Northern Alliance in its struggle against the Taliban regime. A key aspect of the Russian-Iranian alliance is Russian arms delivery to Iran (conventional arms and nuclear technology) as currently there are few countries willing to sell arms to Iran. Besides China, Russia is one of Iran's most important weapons suppliers. Since 1991 Russia has supplied modern weapons to Middle Eastern countries worth $6.9 billion, of which weapons worth $3 billion were sold to Iran. [152] The Russian-Iranian alliance can be seen as one of the most important geopolitical episodes of the post-Cold War era.

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[151] AGOC, 'Caspian oil swaps with Iran to grow fivefold by year-end', August 8, 2002, on-line version.

[152] Cohen, A., 'Putin's Foreign Policy and US-Russian Relations', *The Heritage Foundation,* no. 1406, January 18, 2001.

Since the war in Iraq, Iran is confronted with two main conflict areas. On the one hand is its possible influence on the Shi'i population in Iraq, especially through the Supreme Council of the Islamic Revolution in Iraq (SCIRI) of Ayatollah Mohammed Baqir Al Hakim (see below, 3.2). On the other hand is the cease-fire of the Mujahedin-e Khalq with the US. Instability in Iran will have a destabilising effect on the whole Persian Gulf region especially those countries with a Shi'a minority.

1.2.5 Turkey and Central Eurasia, the Caspian Region

Turkey has an increasing need for oil and gas resources that can no longer be solely fulfilled by Russian supply. In 2000, Turkey consumed 520 bcf of natural gas (nearly all imported), accounting for around 17 percent of Turkey's total energy consumption. Oil consumption and imports during the first four months of 2002 were down approximately 60,000 bbl/d compared to the same period in 2000. In the long-term, however, Turkey's oil demand and imports are expected to increase heavily. Oil constitutes around 42 percent of the country's total energy requirements, but its share is declining while the share of natural gas rises. About 90 percent of Turkey's oil supplies are imported, mainly from the Middle East (Saudi Arabia, Iran, Iraq, Syria) and Russia. Turkey's port of Ceyhan is a major outlet for Iraqi oil exports, with pipeline capacity from Iraq of about 1.2 mbbl/d. Traditionally Russia has been Turkey's largest gas supplier. Considering Russia's own economic situation it will be unlikely that it can meet Turkey's increasing energy demands in the future. Caspian energy resources could therefore be an important alternative for Turkey.

Turkey could also play an important role as a transit country for oil and gas exports to Europe as the EU is seeking oil and gas alternatives in light of decreasing North Sea production. The Baku Tbilisi Ceyhan (BTC), TCGP and the Blue Stream pipeline are racing to get into the Turkish market first. The competition between these rival pipelines has developed into a strategic Great Game, which will in part determine the future of CEA. The need of gas supply has driven Turkey to increasingly follow economic rather than geopolitical policy (in contrast to its oil pipeline approach). The gas business is different from the oil business. The areas of supply and demand need to be directly connected by pipelines, as shipping gas is technically very complex and expensive.[153]

While there is still dispute about the BTC, TCGP and the Blue Stream, pipeline gas deliverance from Iran to Turkey is already underway. In 1996, Iran and Turkey signed an agreement for the delivery of natural gas over a period of 23 years. The pipeline which runs from the western Iranian City of Tabriz to the Turkish capital Ankara opened on December 10th 2001. It has a length of 2,577 km, and an expected capacity of 4 bcm in 2002, with export expected to rise to 10 bcm in 2007. In late 2002, Turkey stopped importing gas from Iran because of price cuts in Russian supply. Iran has carefully treated the gas dispute as an isolated matter and maintains contact on issues such as agriculture and transportation. This approach may pay off if Turkey turns the gas back on and keeps it on. In 2002, however, Turkey has met only a fraction of its purchase pledges. There have been warnings of broader tensions. In September 2002, Tehran Radio commented that the decision to stop the gas flow was 'not a friendly act'.[154] Traditionally, the rivalry between Persia / Iran and Ottoman / Turkey concerned domination over the

[153] Amineh, *Op. cit*., 2003, Ch. 4.

[154] Lelyveld, M., 'Turkey: Ankara cuts Gas Prices after Russian Concessions', *Eurasia Insight,* October 6, 2002, on-line version.

Central Asian transit routes for trade.[155] Since the disintegration of the Soviet Union, Iran and Turkey have entered into competition yet again over their influence in CEA, although in a much more moderate way. There is even co-operation between the two countries, for example within the Economic Co-operation Organisation (ECO). Rivalry between Turkey and Iran could again be inflamed if one moves forward at the expense of the other. The revival of pan-Turkism that disappeared together with the Ottoman Empire in the beginning of the 20th century, would be a threat to Iran and its only direct cultural ally in CEA, Tajikistan. On the other hand, the fall of Uzbekistan's President Karimov and his replacement with an Islamist regime would undermine Turkey's influence in the region considering Uzbekistan's great influence within Central Asia. As regional actors, Turkey and Iran are direct competitors in the Middle East, Central Asia and Afghanistan. At the same time, the emergence of a nuclear Iran would have a great effect on not only Turkish but also European security interests.[156] With a nuclear power on its border Turkey would want to develop a national missile capability of its own. This could also have an effect on strategic perceptions in the Balkans, Aegean and the Caucasus.

The fact that Turkey has entered into co-operation with Israel against Syria and Iraq, and given its good relationship with Azerbaijan, makes Iran turn even more towards CEA. Iran may well increase its alliance with Russia to compensate for its forced isolation. Mistrust between Turkey and Iran is not limited to any particular aspect. Cooperation in one field will therefore always be hostage to other influences in their relationship.

Turkey's co-operation with the US, and the fact that it appears to be turning away from Russia as its most important energy supplier while seeking alternative sources, contributes to hostilities between these two countries. This has provided a reason for Russia's intervention in Turkey's domestic conflicts having discovered the Kurdish card as a means of pressure, especially in context of alternative pipeline construction to the existing Russian network.[157] Russia views Turkey as a traditional geopolitical rival in CEA. Russian military officers are concerned about a growing military imbalance. Turkey's plans for an ambitious 25-year modernisation of its armed forces are under discussion at a time when Russian military capabilities continue to decline for lack of funding.

Russia is also concerned with potential Turkish military presence in the South Caucasus and the Black Sea (relating to the situation in the Caucasus). Although Russia does not have a direct land border with Turkey and there is no allegation of any immediate military threat from Turkey these developments have been alarming in the overall regional context. The decline of Russian forces in the Caucasus shifted the regional balance of forces in favour of the Turkish 3rd Field Army and strong Turkish air forces based at Erzurum, just across the border in Turkey. Against this backdrop, Russian air defence agreements and joint exercises with Armenia appear to be principally directed at a potential threat posed by Turkey.

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[155] Amineh, M. P., *Towards the Control of Oil Resources in the Caspian Region,* New York: St. Martin's Press, 1999, Ch. 3.

[156] Eisenstadt, M., "Preparing for a Nuclear Breakout in the Middle East', *Policywatch*, no. 550, Washington D.C: The Washington Institute for Near East Policy, August 2001.

[157] Amineh, *Op. cit*., 1999, p. 106.

However, most analysis regarding a Turkish military threat is exaggerated, based on an historical recollection of Turkey being Russia's rival and enemy for five centuries and on its status as a NATO member. This also reflects traditional patterns of military thinking, based on Russia having been a militarily dominant power in the region throughout the last century, and also on its continued possession of considerable military strength. The overall military balance between Russia and Turkey favours Russia. Likewise, the regional balance does not provide Turkey with any incentive for military intervention, which is already preoccupied with high-priority security problems: Syria, Cyprus, and more importantly, the Kurdish separatist fighting in southeast Turkey (see 2.3.1). Both countries also have common interests and there is even some co-operation. As Russia seeks markets for its weaponry, it has signed arms sales agreements with Turkey, for example selling helicopters and combat vehicles, also as part-repayment for former Soviet Union debts to Turkey. Russia has joined the Turkey-initiated Black Sea Economic Co-operation organisation (BSEC) that could contribute to further co-operation between the two countries. At the same time the two countries could gain from co-operation in the context of the Blue Stream pipeline project, rivalling the US-supported TCGP.

Turkey's wish to become a member of the EU still seems a remote actuality. During the Copenhagen EU Summit in December 2002, the EU determined that Turkey would be invited for membership negotiations after December 2004. The EU refuses membership talks with Turkey until it meets minimum requirements on human rights and democracy. Although the Turkish government has passed laws that ban the death penalty and grant more rights to the Kurdish population, the EU has noted shortcomings in basic human rights such as restrictions on freedom of expression, torture of prisoners, and lack of civilian control of the Turkish military. Another crucial issue for Turkey is the consequence of the US-led war on Iraq. Turkey fears that Saddam Hussein's removal could result in a separate state of Iraqi Kurdistan, which could serve as a model for the Kurds in Turkey. From the viewpoint of regional stability, Turkey's political and economic stability will be crucial. It would be a more effective ally for the US in its war on terrorism and could pass a series of political reforms such as for the Cyprus issue.[158] At the same time, it is an attractive economic partner for the CEA countries.

1.2.6 European Union and Central Eurasia, the Caspian Region

EU political and business circles fear the gradual exhaustion of North Sea oil and gas resources. Consequently, they aim to diversify the sources of their raw materials. There is a strong need for a long-term EU common energy policy. The EU imports about 90 percent of its total oil consumption, and 40 percent of gas consumption. Up to 40 percent of the EU's gas imports currently come and will continue to come from Russia. The EU candidate states have an oil dependence of 90–94 percent and a gas dependence of 60–90 percent. OPEC represents 45 percent of current EU oil imports. Both the launching of the EU-Russia strategic energy partnership on November 30th 2000 in Paris, as well as the vast energy potential of CEA have refocused the EU's attention on the necessity of diversifying its energy imports. Although the Caspian region could not substitute OPEC imports, it surely could provide an alternative.

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[158] Kaya, K., 'Turkey's Political Crisis and its possible Implications', *Central Asia-Caucasus Analyst,* July 17, 2002, pp. 3-4.

The EU has been aware of the unpreparedness of CEA states to manage their newly gained independence and is highly concerned about the failure of positive political and economic developments in CEA. Not least because of the EU's geographic proximity, political and economic instability in CEA will have a great effect on Europe's security interests. The EU therefore has declared that major efforts must be made to stabilise these countries through assistance and other means. Unlike the US, however, neither the EU's governments nor the EU as a whole have yet developed a comprehensive policy agenda with regard to political and economic development in CEA. This is partly due to the fact that the EU member countries each have different priorities. France is more oriented towards Northern Africa, Germany towards Eastern Europe, and Britain towards the Baltic States.

Generally, the EU is in a favourable position for CEA regional involvement. It is not under the suspicion of harbouring superpower aspirations like the US and is an attractive and geographically close importer of CEA oil and gas resources. The EU follows a different policy from the US with regards to Iran, and does not incur Russian suspicion with regards to its eastward expansion.

The main instruments of European strategy in CEA since December 1991 have been the Agreements on Partnership and Cooperation signed with all CEA countries (except for Tajikistan) and with Belarus, Moldova, Mongolia, Russia, and Ukraine. These do not promise admission to the EU, but are aimed at affecting European interests in co-operation with the CIS on a bilateral basis. The agreements can be voided in the case of human rights violations with the intention that the EU can put more political pressure on the CEA governments. Other important instruments for the EU to pursue its interests in CEA are the Technical Assistance to the Commonwealth of Independent States (TACIS) program, Transport Corridor Europe-Caucasus-Central Asia (TRACECA) initiated at a conference in Brussels in 1993,[159] as well as the Black Sea Regional Energy Centre (BSREC), the Black Sea Environmental Program (BSEP), and Interstate Oil and Gas Transport to Europe (INOGATE).

The Organisation for Security and Co-operation in Europe (OSCE) is another international institution that is directly linked to European interests. Since the end of the Cold War, OSCE documents, especially the Paris Charter of 1990, make CEA an integral part of the European security system. EU global ambitions are characterised by the European Common Foreign and Security Policy (ECFSP) project, whose goal is to transform the EU into a global actor that can compete with the US and exercise a stabilising influence in the Mediterranean, the Middle East, North Africa, Eastern Europe, as well as CEA. Discussions of a Common Foreign and Security Policy and a single European army were first initiated in 1992 at a Petersburg summit in Bonn. At a summit in Helsinki in December 1999, the EU heads of state adopted a resolution on the establishment of a quick-response force. In March 2000, the prototype for a political and military headquarters of the quick-response forces was established in Brussels. In 2000, the EU member states made the final decision to establish a Super Army consisting of 60,000 rapid-response special forces by 2003; 30,000 navy and army personnel; 10,000 auxiliary troops; 400

[159] TRACECA co-operates with financial institutions such as the World Bank and the European Bank for Reconstruction and Development (EBRD) as well as the Black Sea Economic Co-operation (BSEC), initiated by Turkey in 1992 to integrate the region's transport networks with Europe and thus support Western and Turkish co-operation in the face of a closer alliance between Russia and Iran.

military planes; and 100 military vessels. The European army will be applied over a radius of 4,000 km. A subsequent proposal was made to increase the European forces to 64,000, with 579 military aircraft and 75 naval vessels.[160]

1.3 Matrix of risks in Central Eurasia and the Caspian Region

There are similar effects on global security of much-needed natural resources, oil and gas, concentrated in but few regions of the world. CEA and the Caspian Region are members of such regions, harbouring a significant portion of the global hydrocarbon reserves. Uncertainty around local and geopolitical impediments and possibilities for security, production and transportation of these resources to global markets is problematic and a key concern. Thus, despite such reserves, the newly independent CEA states appear to be rapidly joining the ranks of the poor countries of the globe. Although there had been initial signs of economic recovery, none of the CEA states has succeeded in creating conditions for sustainable political and economic development. Current restructuring of political systems in most of these countries is characterised by the emergence of new types of authoritarian regimes with weak domestic sovereignty. The CEA region is faced with a complex of problems. The weak, if not unstable, political situation and socio-economic problems could give rise to various forms of social upheavals, terrorism, organised crime, and ecological disasters. What impact do these particular risks have on political stability and economic development in CEA?

1.3.1 Political risks

One of the most important limitations on the democratisation process in CEA concerns local and/or tribal identities in the region. Such identities have played important political and economic roles in CEA societies both before and after independence. Simultaneously, there is a massive rise in corruption in public life tainting the reputation of politicians across the spectrum. The process of nation-state building is further complicated by the issue of minorities having caused various armed conflicts since the independence of the CEA states in 1991. CEA is a region in which all of the republics have sizeable minority groups. These conflicts cause serious concerns about ethnic stability in CEA.

Civil society is at a rudimentary stage of development in the CEA states. The most vigorous informal associations are based on traditional structures and draw on family and neighbourhood ties. Western-style non-governmental organisations (NGOs) are a new phenomenon. Political parties have also attracted little support from the public at large. The majority of the population in the CEA states has little respect for politicians and little interest in the political process.

CEA countries have important border problems of demarcation, uncontrolled border crossings and territorial claims coming from the neighbouring countries not only with some of the regional powers such as Russia and China, but also among themselves. Conflict around the demarcation of the Caspian Sea is an important point in case as it poses an obstacle to the construction of pipelines across the Sea, as well as to the production of oil in the Caspian Sea.

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[160] Mauer, V., 'Eine Sicherheits- und Verteidigungspolitik für Europa', *Das Parlament,* no. 47, November 17, 2000, pp. 22-30.

1.3.1.1 The Caspian legal regime dispute

After the break-up of the Soviet Union, the Caspian littoral states met in Astrakhan (1992) and Tehran (1993), to discuss the Caspian demarcation and other Caspian-related issues such as regional development, the environment and fishing rights. In November 1994, the littoral states established a Caspian coordinating committee to work on demarcation and other related issues, including navigation and fishing rights. After a decade of disputes[161] on November 1st 2001, Russia, Kazakhstan, Azerbaijan and Turkmenistan agreed that the Caspian Sea should be divided "along lines acceptable to bordering and opposite countries, i.e., in a bilateral manner."[162] In the case of a division into national sectors Iran would only receive 12–13 percent of the seabed.[163]

Iran stands alone in its position on the division of the Caspian Sea. It still demands the continued validity of the 1921 and 1940 contracts, or a division of the Caspian Sea into equal sectors with a share of 20 percent of the seabed for Iran. On April 23–24th 2002, in Ashgabat, Turkmenistan, the Presidents of the five littoral states held their first summit meeting since the collapse of the Soviet Union. As had been expected the meeting ended without concrete results. Because of the unsuccessful summit in Ashgabat, Iran announced it would begin unilateral development of energy resources in its portion of the sea. Although Iran has not announced intentions of developing resources in disputed areas, this decision will surely raise tensions.[164] On September 23rd 2002, Russia and Azerbaijan signed an agreement demarcating their common border in the Caspian Sea. Iran repeated its opposition to any such bilateral accords. It maintains its position of equal 20 percent divisions of the seabed between the five Caspian littoral states.[165]

If no solution can be found satisfying the demands of the five littoral states a scenario of no-solution will prevail. This could lead to a proliferation of conflicts and disputes and result in a greater involvement of Russia or the US in the region. It will also prevent large-scale investments by TNOCs for the production and export of the oil and gas resources in the Caspian.

1.3.2 Economic risks

Since independence from the Soviet Union in 1991, the CEA countries have been exposed to the decisive impact of several powerful processes: nation-state building, the formation of national economies, and the transition from a planned to a market economy. The transition over the past ten years to a market economy and democracy has provided some grounds for optimism but in many ways has also been a social and moral disaster. The problems of transition attract particular attention because of the region's huge energy resources. TNOCs already have made large-scale investments in energy projects. Whether it will be possible to attract FDI to the region to fully exploit economic potential will largely depend on the political stability within these countries, which yet again will be determined by their respective inter-

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[161] For a detailed analysis the legal regime dispute see Amineh, *Op. cit.*, 2003.

[162] *BBC Monitoring Service*, November 1, 2001.

[163] EIA, '*Iran-Country Analysis Brief'*, May 2002, on-line version.

[164] McConnell, A., 'Iran announces unilateral decision to Develop Caspian Resources', *Eurasia Insight,* June 4, 2002, on-line version.

[165] 'Caspian: Russia, Azerbaijan sign bilateral deal', *Radio Free Europe,* September 23, 2002.

nal developments. Where growth is measured, it is not necessarily a reliable indicator of economic or social health, as it is based on sharp rises in inequality and an explosive growth of intense misery and poverty. In many countries the experience of the last ten years has been dispiriting. Although people have gained greater political freedom, they have paid a heavy price in other ways. The rapid rise in unemployment and the fall in real value of wages and pensions have plunged millions of people into poverty. Today there is a much wider gap in incomes between rich and poor than under Soviet rule. These developments raise serious questions not only about the security in the region, but also in terms of unhindered production and export of the region's oil and gas resources.[166]

1.3.2.1 Pipeline issues

During the Tsarist and Soviet periods, CEA was integrated into the world economy through Russia. Since the disintegration of the Soviet Union in 1991 it is through oil and gas that CEA aims to be reintegrated into the world economy. CEA governments hope to increase oil production as soon as possible, to resolve socio-economic and political problems. One of the main obstacles to the export of oil and gas resources is the lack of pipeline access, which limits production in the region. Russia demands participation and drives its influence through the control of the existing pipeline system in the region. However, the Soviet-era oil and gas pipeline system is described as being of poor design, shabby construction, made of inferior materials, subject to shoddy maintenance – and it is deteriorating with age. The Caspian republics thus seek multiple pipeline options to distance themselves from Russia and to gain access to different markets and consumers in Europe, the US and Asia.[167] There are five potential routes for the main pipeline:

- to the Turkish Mediterranean town of Ceyhan and its port at Yumurtalik, via Georgia;
- to the Iranian Persian Gulf port of Kharg Island via Iran, with the possibility of an oil swap in the initial phase to decrease costs;
- to the Pakistani Indian Ocean port of Gwadar, via an undersea pipeline across the Caspian, then via Turkmenistan, Afghanistan, and Pakistan;
- to the Chinese Sea port of Shanghai along the Silk Route eastwards via the Caspian undersea pipeline, Turkmenistan, Uzbekistan, Tajikistan, and China; and
- substantially upgrading the Baku-Supsa and/or the Baku Novorossiysk pipelines and ports/terminals to enable them to carry larger volumes of oil.

The AGT-pipeline system

For some time the Azerbaijan-Georgia-Turkey (AGT) pipeline system has been the most likely project as the US aims to get CEA countries away from Russian influence and isolate Iran. At the same time the AGT would bring to the Eastern Mediterranean a supply of oil that is non-OPEC, non-Arab, and from secularised Muslims. The AGT is a complete entity consisting of:

- oil and gas fields (Azeri-Chirag-Guneshli [oil], Shah Deniz [gas], and others);
- coastal oil and gas terminals (Sangachal);

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166 Amineh, *Op. cit*., 2003, Ch. 2.

167 Amineh, M.P., 'Sicherheit und Entwicklung in Eurasien-neue Gedanken zur Geopolitik im Zeitalter der Globalisierung', in: Reiter, E. (ed.), *Jahrbuch für internationale Sicherheitspolitik,* Vol. 1, Hamburg, Berlin, Bonn: MITTLER, 2002.

- downstream terminals (Erzurum and Yumurtalik);
- two pipelines (Baku-Tbilisi-Ceyhan or BTC pipeline [oil], Baku-Tbilisi-Erzurum or South Caucasus Pipeline, SCP [gas]).

The BTC western route from Azerbaijan through the Georgian capital Tbilisi and Turkey to the port of Ceyhan on the Mediterranean has a length of 1,730 km with a section of 1,070 km in Turkey. The projected completion date is now 2005. Its costs are estimated at $3–4 billion. The BTC pipeline is by far the most expensive pipeline of the western options. Turkey has promised to cover the costs on its territory at $1.4 billion. Based on a transport of 800,000 bbl/d through this pipeline the total estimated transport costs from Baku to Italian ports are $2.80 per bbl. This is higher than any other western alternative pipeline options.

The SCP gas pipeline from Baku via Tbilisi to Erzurum has a planned capacity of 254 bcf/y. The pipeline will have a length of 864 km with estimated costs of $1 billion. Work on the pipeline was scheduled to begin in 2003 and end in 2005. However, construction may be delayed because of continuing uncertainty over whether gas from the Shah-Deniz field can be sold to Turkey. The AGT pipeline system is highly disputed not only by major powers who feel excluded like Russia and Iran but also by NGOs.

According to Nana Janashia,[168] Director of the Caucasus Environmental NGO Network (CENN), the BTC is economically, politically, and environmentally not viable. Construction and transportation costs are very high and Turkey's oil demand will probably not rise as much as has been projected in the near future. The AGT pipeline system will only provide limited employment opportunities for the local population; will involve an over-pricing of land, and is hampered by the corruption of policy-makers. The construction of the pipeline system could have negative effects on agricultural production and on infrastructure (roads and water pipelines). The BTC pipeline is closely positioned to seven potential conflict areas (Nagorno-Karabakh, Armenia vs. Azerbaijan [15 km from AGT system], Georgia vs. South Ossetia [55 km from AGT system], North Ossetia vs. Ingushetia [220 km from AGT system], Georgia vs. Abkhazia [130 km from AGT system], Russia vs. Chechnya [110 km from AGT system], Russia vs. Dagestan [80 km from AGT system], Turkey vs. PKK [pipeline passes through edge of conflict region]) (see 13.3). Corruption of Azerbaijan's and Georgia's policy-makers, and non-compliance with European environmental legal standards pose serious threats to the area's environment.

Other pipeline options

The BTC sister project is the TCGP from Turkmenbashy (Turkmenistan) via Baku and Tbilisi to Erzurum in Turkey. The pipeline will cost between $2 to $3 billion. Its initial throughput will be 565 bcf eventually rising to 1.1 tcf/y. Several TNOCs have appraised the feasibility of the project, one of which is the Transcaspian Gas Pipeline Project, a grouping of Bechtel, General Electric, and Royal Dutch Shell. The TCGP encounters several problems. It competes with the Russian Blue Stream pipeline and the Azeri Baku Erzurum pipeline that will provide Turkey with natural gas. It is also hampered by the lack of a legal regime for the Caspian Sea and several Caspian littoral states are opposed to the pipeline on environmental grounds.

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[168] Based on an Interview with Nana Janashia on March 3, 2003.

The Blue Stream pipeline is an undersea route across the Black Sea from the Russian port of Tuapse to Samsun, Turkey with which Russian gas will compete with Azeri and Turkmen gas. The costs are $3.4 billion. Large parts of the on-shore pipeline were built by the Turkish company BOTAS and Russia's Gazprom. The Russian firm, Stroitransgaz, and the Japanese engineering firm, Saipem, built the undersea section. The companies involved in the project are Gazprom and Italy's ENI. Pipe-laying started in October 2001. Construction was finished on October 20th 2002. Turkey plans to start receiving an annual 3 bcm of natural gas in 2003, with an increase to an annual 16 bcm by 2008. The Blue Stream has come under fire because of corruption. The US has heavily opposed the Blue Stream pipeline as it endangers the prospects for the TCGP. The pipeline also would increase Turkey's reliance on Russian gas from a current 66 percent to about 80 percent, and could hamper US efforts to reduce Russian influence in the South Caucasus.

In April 2003 Ukraine agreed to build the longest stretch of a $1 billion pipeline to boost Turkmenistan's gas exports to Ukraine. The pipeline has a length of 1,070 km and will run through Kazakhstan Saratove region before entering Ukraine. Construction is expected to be finished by 2007. Shipments through this pipeline are expected to be Turkmenistan's largest source of foreign exchange earnings for the foreseeable future. Possible alternatives to the BTC, TCGP, and Blue Stream pipeline are the following:

- The trans-Balkan line by the Albanian-Macedonian-Bulgarian Oil Pipeline Corporation (AMBO) consortium headquartered in Pound Ridge, New York. The AMBO pipeline will be an integral part of the East-West corridor. It will permit TNOCs operating in the Caspian to ship their oil to Rotterdam and to the east coast of the US.
- A route over the Bosporus via Bulgaria to Alexandroupolis in Greece discussed by a joint venture (*TransBalkanNeft JV*) of Bulgaria, Greece and Russia the Trans-Balkan-Oil Pipeline, with a distribution of 50 percent for Russia and 25 percent for Greece and Bulgaria.
- A line from Odessa to Brody (Ukraine), and further to Gdansk (Poland) with optional spurs ending in Zastawa (Poland) in Schwechat (Austria), or to the northern Druzhba line at Plotsk (Poland) and/or Gdansk on the Baltic Sea coast.
- A route from Constanza (Romania) via Hungary, Slovenia and/or Croatia to Trieste. A bypass is the southeast European Line pipeline from Constanza via Pancevo and Omisalj to Trieste, with a length of 1200 km. The EU has declared that it is ready to import gas from Turkmenistan via Iran and Turkey and also through Russia and Ukraine to Northern Europe. Through INOGATE, Europe also supports construction of a pipeline from Tabriz through the Nakhichevan Republic to Armenia to provide Armenia with Turkmen / Iranian gas. One of the main security problems for this option is that the pipeline must be constructed along the Kurdish area of the southeast Turkey.
- There is also progress, mostly by Iran and to a lesser extent by the EU, on discussions for the construction of a pipeline to export Iranian gas via Pakistan to India. This pipeline conflicts with the US-supported pipeline from Turkmenistan across Afghanistan and Pakistan to India.

Exactly where such pipelines will run, who will finance them and who will control them are the key issues upon which billions of dollars and the political future of the region depend. While oil can also be transported by ship, thus providing some flexibility, for the export of gas there is no other viable alternative than transport by pipeline. At the moment, there are several different routes under consideration.

The final decisions will depend on various aspects of local and regional interests as well as technical and infrastructure practicalities.[169]

1.3.3 Ethno-religious risks[170]

Poverty is the root of political instability and the precondition for ethno-religious conflict throughout the region since the collapse of the Soviet Union. There are several existing or potential armed conflicts in CEA that could have a direct influence on the construction of pipelines from the Caspian and the safe transport of oil and gas as these pipelines would either pass along these areas of conflict or even directly cross such territory, as for Kurdistan in Turkey. Damage to pipelines by one or several of rival groups is one of the greatest fears of investors as well as consumer countries. Conflicts particularly threaten the BTC pipeline and the TCGP as both pass along several of the conflict areas.

1.3.3.1 Georgia

Abkhazia

In 1988 an organisation called the Abkhazian Forum proclaimed Abkhazia to be independent from Georgia, provoking military clashes. The Abkhaz rebellion festered through the fall and winter of 1992-1993, during which time Eduard Shevardnadze won a landslide presidential victory in Georgia. The conflict displaced 250,000 civilians (70% of the population) most of them Georgian, and killed between 10,000 and 20,000 people. A truce was declared in 1994, but tension has persisted, with several outbreaks of fighting followed by renewed cease-fires, throughout the 1990s. Georgian guerrilla soldiers have been operating in Abkhazia (without the sanction of the Russian government) and clashes between them and the Abkhaz escalated through 2001, nearly breaking out into another war. Mistrust remains on both sides. The Abkhaz suspect that the Georgian government may restart the war with American support and the Georgian government fears Abkhazia's closeness to Russia.

Ajaria

an Autonomous Republic inside Georgia under the Soviet regime, retained *de facto* autonomy after 1991 even though Georgian independence was established as a unitary state without autonomous sub-units. There is no question of Ajarian secession from Georgia. Partly for this reason, Ajaria is actually one of the economically more prosperous regions of Georgia. The issue of the Russian military presence in Batumi, for Abashidze, in principle is separate from internal Georgian question of determining the rights and responsibilities of the region vis-à-vis the central authorities in Tbilisi.

Javakhetia

is divided into two districts called Akhalkalaki and Ninotsminda (formerly Bogdanovka), which are also the names of the district capitals that make up about 20 percent of the total population. The Armenian national movement in Javakhetia was formed in response to events in mountainous Karabakh. Both regions border Armenia proper, and Armenians are the overwhelming majority of the population in each. Although Javakhetia was effectively outside Tbilisi's control from the late 1980s through 1991, the self-constituted political-administrative apparatus of the region voluntarily dissolved itself once

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[169] Based on Amineh, M.P., 'Geopolitiek van energiebronnen in de kaspische regio', *Internationale Spectator,* Vol. 56, no. 2, February 2002, pp. 81-89.

[170] Based on private archival research.

Shevardnadze came to power and named a prefect acceptable to the local population. The region accepted the Tbilisi regime; the Armenian organisation 'Javakhk' no longer exists *per se* in Javakhetia.

Tskhinvali (South Ossetia)
During 1989-90, as the USSR was disintegrating there were calls from South Ossetia (in northern Georgia) to break away from Georgia and unify with North Ossetia (on Russia's southern border). This developed into a two-year conflict with the Georgian government, in which at least 1,000 people died. Relations between South Ossetia and Georgia have since improved, although there is still no formal settlement.

1.3.3.2 Azerbaijan/Armenia

Nagorno Karabakh
Both Azerbaijani and Armenians view the region Nagorno-Karabakh as their historical patrimony. For this reason during the Soviet period Nagorno-Karabakh was an autonomous region within the Azerbaijan SSR, mainly inhabited by Armenians. In 1987, the Armenian-dominated regional council requested that the territory be transferred to Armenia, but Moscow rejected this request. On September 11th 1989, the Armenian parliament declared that autonomous Nagorno-Karabakh belonged to Armenia. Armed conflicts triggered a large-scale exodus of Azerbaijanis from Armenia, and of Armenians from Azerbaijan. In early 1989 some 5,000 Soviet troops were sent into Nagorno-Karabakh, establishing direct control of the region through most of the year. By this time the conflict had developed into a full-scale war. As a result, up to 800,000 Azeris became refugees, displaced to the rest of Azerbaijan, and 20% of Azerbaijan's territory became occupied by Armenia. That same year, the Republic of Armenia's army got involved in the war. Fighting continued until a cease-fire was agreed with Russian mediation in May 1994. At least 25,000 people were killed in the war. The conflict remains unresolved.

1.3.3.3 Tajikistan

Tajikistan is the only CEA country in which social tensions from the beginning of its independence emerged in form of a civil war between Islamist and nationalist anti-Communist groups. The first President of Tajikistan, Rakhmon Nabiyev, former Secretary General of the Communist Party of Tajikistan, was forced to resign in September 1992 following street riots and protests in Dushanbe which left hundreds dead. Although the Russian military entered Tajikistan they could not provide enough protection to Nabiyev to keep him in power. The opposition was led by a group of Islamists under the banner of the Islamic Renaissance Party (IRP). After five years of fighting, on June 27th 1997, a General Agreement on Peace and National Accord in Tajikistan was concluded. However, fighting continued and final implementation of the agreement did not take place until February 2000 when parliamentary elections were held. While the elections formally ended the period of transition initiated by the 1997 agreement, the division within Tajik society could only partly be resolved. Violence has remained a problem and some armed groups continue to maintain control of parts of the country. In 2001 insecurity was worsened by the presence of the Islamic Movement of Uzbekistan (IMU) now the Islamic Party of Turkestan (IPT) in Tajikistan, as well as by the influence of the Hizb-ut Tahrir (Liberation Party, HT) from Uzbekistan. Despite these developments relatively stability has been reached in the political system of Tajikistan since 1997.[171]

[171] Abdullaev, K., Akbarzadeh, S., *Historical Dictionary of Tajikistan,* Lanham MD: Rowman & Littlefield, 2001.

1.3.3.4 China

Xinjiang Uighur Autonomous Region (XUAR)

The XUAR is mainly a Muslim area in the far north-west of China. The largest ethnic group in the province is the Uighurs accounting for about seven million people. Additionally, there are 20 ethnic minorities in the region, including the Han, Kazakhs, Hui, Kyrgyz, and Mongolians, and other ethnic groups like Tajiks and Russians. Since 1990 separatist movements have strengthened in the XUAR. Tensions escalated in 1996 and 1997 when during separatist riots in Yining at least ten people were killed and 144 wounded, and in Urumqi two died and 27 were wounded. The Chinese government responded with executions, mosque-closures, arrests, arms seizures, large troop movements, and attempts to stop arms flow into the region.

1.3.4 Ecology

Russia and the CEA countries are confronted with a great environmental disaster especially with regard to the Aral Sea and the Caspian Sea. The drying out of the Aral Sea is having far-reaching consequences for the climate and biodiversity of the surrounding regions, and desert winds are transporting sand and salt over long distances, depositing millions of tons of (often polluted) salts on agricultural land all over the basin area. Due to inadequate and badly maintained drainage systems, water-logging is widespread and soil salinity is an increasing environmental problem. The worsening ecology of the region makes living in many areas quite inhospitable – such as Karakalpakstan in Uzbekistan, and Kyzlorda in Kazakhstan, where poverty and environmental degradation are linked in a vicious downward spiral. The Caspian Sea suffers from immense pollution, depletion of fish, and a rising sea level causing flooding and the displacing of local population.

When the BTC pipeline is constructed, earthquakes (especially in Turkey), storms at the port of Yumurtalik, and tanker accidents could cause a great pollution with leaking oil tanks or pipelines. Additionally, the pipeline will pass through protected nature areas such as the State Gobustani Reserve in Azerbaijan, the Ktsia Tabaskuri, the Borjomi-Karagauli National Park, the Borjomi aquifer in Georgia, whose safety is threatened during construction but also by damaged leaking pipelines.[172]

1.3.5 Terrorism

Unlike other Islamic countries of the Middle East, North Africa and South Asia, where politicised Islam and its varieties has a long-term historical tradition, political Islam in CEA countries is a new experience and phenomenon. The CEA region, with approximately 50 million Muslims, is one of the largest Muslim populations in the world. Only in Georgia and Armenia does the Muslim population amount to less than 50 percent of the total population.

Economic crisis in CEA countries since the disintegration of the Soviet Union has made the region vulnerable to radical Islamist movements. Most Islamist groups emerged out of the Islamist underground during the Soviet era. Many of them are active in the Ferghana Valley, which is one of the poorest areas in CEA, with high unemployment rates creating fertile ground for Islamist revivalism.

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[172] Based on interview with Nana Janashia, Director of the Caucasus Environmental NGO Network (CENN).

Currently, the main Islamist groups in CEA are the HT and the IPT. The HT is an international organisation, founded in Jerusalem in 1953;[173] it is proscribed in many countries (including in the Middle East), but acts openly in Western Europe and parts of the CIS. The IPT is a home-grown group that developed out of Soviet-era Islamist revivalist movements. Given the dearth of reliable information, it is impossible to know the degree to which HT and the IPT are linked. It is also difficult to estimate their relative size. Anecdotal evidence suggests that HT is the larger (possibly numbering some 50,000 adherents), with a broader geographical spread. Both groups aim to establish an Islamic state based on the model of the early Caliphate. The IPT espouses military confrontation; HT, at least in its publications, advocates the use of peaceful means to achieve its goals, though there are intimations that it would sanction the use of force if necessary.

Since the late 1990s, the government of Uzbekistan has accused both groups of acts of terrorism, and of plotting to overthrow the government and the constitutional order of the country. Human rights organisations are dubious as to the validity of the evidence that has been produced against them. However, other Central Asian governments have concluded that these movements do represent a danger to regional security. Consequently, they have adopted increasingly repressive measures towards them. Some Western governments have concurred with the view that the Islamist threat is serious. In September 2000, the US State Department placed IPT on the list of international terrorist organisations to which US citizens are forbidden to give assistance, and whose members are denied entry into the US.[174] With the launching of the Western-led 'War on Terrorism' in late 2001, the Uzbek government, and to a somewhat lesser extent the other Central Asian governments, intensified their campaign against suspected Islamist radicals. This has resulted in a curtailment of civil liberties for all, and an increase in reports of gross violations of human rights. The effect has been to reduce the more obvious manifestations of Islamist activity in the region. However, it is too soon to say whether or not this will have a lasting impact.

1.3.6 Illegal transport of drugs

The CEA states are situated between the world's largest illicit opium producers and the most lucrative markets in Western Europe. They border or are located in close proximity to the countries of the Golden Crescent (Afghanistan, Pakistan and Iran) and, via China, have access to the countries of the Golden Triangle (Burma, Laos and Thailand), which are the world's largest producers of illicit opiates. As a result, since the disintegration of the Soviet Union, CEA has emerged as a major international drug-trafficking centre.

The flourishing drug trade in the region enables separatist and radical Islamist groups to become financially self-sufficient. A case in point is the IPT, known to be a key actor in drug trafficking from Afghanistan via CEA to Europe. The founder and military leader of the IPT, Juma Namangani, was heavily involved in drug smuggling through Tajikistan and also used the IPT and his contacts with the

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[173] The founder was a Palestinian, Sheikh Taki ad-din Nabhani (1909-78), a judge in the Sharia court, Haifa; he later moved to Nablus.

[174] International Crisis Group, 'The IMU and the Hizb-ut Tahrir: Implications of the Afghanistan Campaign', *Central Asia Briefing,* Brussels: ICG, January 30, 2002, pp. 2-6, Halbach, U., 'Islam und Islamistische Bewegungen in Zentralasien', *Aus Politik und Zeitgeschichte,* Beilage zu Das Parlament, no. 3-4, 2002.

Chechens to increase this trade. It has also been repeatedly reported that Osama bin Laden finances al-Qaeda activities with profits from his opium syndicate operated in western Afghanistan. Such drug trade has potential to affect the internal political and economic developments in these countries as well as the projects of foreign actors in the region, especially the exploitation and export of CEA oil and gas resources.[175]

1.4 Russia

1.4.1 Russia's political environment

With the disintegration of the Soviet Union at the end of 1991, Russia had to reconsider its novel forms of statehood and national identity at home as well as conceive new approaches for its foreign relations. While some members of the Russian political élite still see Russia as a superpower in world politics and a counterweight to the US, other more liberal policy-makers strive for liberalisation, democracy and close cooperation with the West. In general, two different approaches concerning Russia's geopolitical mapping can be distinguished into what we call the liberal internationalists or Westernisers (*zapadniki*), and the Eurasianists with various orientations.

Separation between Westernisers and Eurasianists in Russian geopolitical mapping took place during *Perestroika* during the 1980s. The former believe that Western values of pluralism and democracy are universal and thus could be extended to Russia. Conversely, the Eurasianists adhere to a nationalist-patriotic course, believing that because of geographical, psychological, historical and cultural particularity, Russia can neither be classified as East nor West. Integral to this vision is that Russia is a strong state, communitarianist, and a dominant Eurasian power. Both communists and the extreme right share this Eurasianism ideology. As one critic recently stated, "Eurasianism has succeeded in reconciling the often contradictory philosophies of communism, religious orthodoxy and national fundamentalism."[176] The avowed goal of Eurasianism is to reinstate Russia's dominance in the Eurasian region. O'Loughlin[177] distinguishes the Eurasianist perspective into four different streams:

- *Hard-line Eurasianists* – Representatives of this view are Alexander Dugin, the Russian nationalist and editor of the geopolitical journal *Elementy,* and Vladimir Zhirinovsky, a national-patriotic member of the Duma and three times a candidate for presidency. Dugin contrasts the Atlanticist (sea powers) and Eurasianist (land powers) world that according to him have a totally different orientation in geopolitical and civilisational terms. He defines his geopolitical mapping as a *Pax Eurasiatica*, is considered a Great-Russian and has been a passionate agitator of a crusader's mentality against the Islamist threat. He also agitated against the Baltic states, Poland and Turkey and other frontier nations around Russia. Zhirinovsky calls upon the US, Europe, China and Japan to join Russia and form a world of pan-regions.

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[175] International Crisis Group, 'Central Asia: Drugs and Conflict', *ICG Asia Report,* no. 25, Brussels: ICG, November 26, 2000, p. 3.

[176] Quoted in: Amalendu, M., 'Shanghai 5 and the emerging alliance in Central Asia: the closed society and its enemies', *Central Asian Survey*, Vol. 20, no. 3, 2001, pp. 305-321.

[177] O'Loughlin, J., *Geopolitical Fantasies, National Strategies and Ordinary Russians in the post-Communist Era*, Boulder, CO: Institute of Behavioural Science, University of Colorado, 2000.

- Gennady Zyuganov follows the communist version of the *national-patriotic ideology*. Zyuganov holds the Westernisers (Gorbachev, Yakovlev, Shevardnadze, Yeltsin and Kozyrev) responsible for Russia's fall in living standards and power status. He believes that the West wants to marginalise Russia.
- *Democratic statism* combines Western liberalism and Russian neo-nationalism. The proponents of this view acknowledge that Russia has to cooperate with the West, but simultaneously consider CEA or the near-abroad as central to Russia's security. To regain influence in the region they stress the building of alliances, the use of military force and economic relations.
- Russian *nationalism and Eurasianism* is exemplified by Alexander Solzhenitsyn who rejects Western materialism and criticises its lack of spirituality. Solzhenitsyn calls for domestic order and spiritual harmony as a Russian geographic destiny extending as far as Siberia.

Eurasianism shaped the thinking and inspired the fantasies of those preaching for a restoration of the USSR. It has now become the ideological framework for those who seek Russia's reintegration within CEA. The concept of Eurasianism is solely based on the notion of Russia as superpower. At the same time, Eurasianists fear that if Russia does not subordinate Eurasia to its own sphere of influence then other powers, Germany, China or Islamist forces will do so. President Putin's accession to power gave the re-emerging Eurasianism a boost. There are indications that the Kremlin is sympathetic towards the Eurasian movement, and more importantly, that elements of the Federal Security Service support the Eurasianists. Putin, however, has a more pragmatic approach towards CEA. He recognises Russia's limited political and economic capabilities and the need to make concessions.[178]

An interesting aspect of the Putin Presidency has been his success in bringing Russia's domestic and foreign policy under tighter centralised control. He has replaced several members of the Russian political élite by, for him, more favourable persons. Those replaced include oligarchs and media magnates such as Boris Berezovsky and Vladimir Gusinsky, the head of the Ministry of Atomic energy Yevgeny Adamov, who tried to conclude nuclear deals with Iran that were not approved by the Kremlin, as well as the director of gas monopoly Gazprom and the leader of the Defence Ministry. He exchanged several interior ministers, set up plenipotentiaries to overseen Russia's 89 regions, consolidated Russia's arms sales agencies into Rosoboronoexport to get greater control of a major source of foreign exchange, and improve Russia's economy by expanding its international business ties.[179] In contrast to former President Yeltsin who had hostile relations with the Duma, Putin seems to find support for his policy in the Duma.

1.4.2 Matrix of risks in Russia

Chechnya

The Russian republic of Chechnya declared independence in 1991. In 1994 Russia sent in troops to reclaim the republic and crush the independence movement. Russia's refusal to grant independence to Chechnya is widely recognised to have been motivated by the desire for control over the Baku-Novorossiysk oil route. The Chechens counter-attacked and drove the Russians back. Between 60,000

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[178] See Smith, M.A., *Russian Foreign Polciy 2000: The Near Abroad, Conflict Studies Research Center,* December, 2000.

[179] See Putin's May 16th 2003 State of the Union Address.

and 100,000 were killed in the war, many of them civilians. The Russians re-invaded Chechnya in 1999. Russia claims to have won the war but the fighting continues. According to official Russian figures, 13,000 Chechen soldiers and 3,000 Russian soldiers were killed in the Second Chechen war. Deaths among the civilian population are estimated at between 9,000 and 14,000. The conflict remains unresolved.

The Chechen war has deteriorated Russia's relations with Georgia. Since the second war in Chechnya began in 1999, Russia has accused Georgia of harbouring Chechen terrorists in the Pankisi Gorge region. In February 2002, the US embassy in Tbilisi even spoke about the possible presence of al-Qaeda fighters there. However, this has never been proven. The October 23rd 2002 attack on Moscow's Poshipnikov Zavod Theatre was a case in point. It was probably carried out by the Special Purpose Islamic Regiment (SPIR) also known as the Islamic Special Purpose Regiment, the Islamic International Brigade (IIB), and Riyadus-Salikhin Reconnaissance and Sabotage Battalion of Chechen Martyrs. According to press reports their foundation in the second half of the 1990s was due to Amir al-Khattab's and Osama bin-Laden's shared desire in 1995 to 'create one Muslim nation on the Caucasus under fundamentalist rule'. Millions of dollars were pumped into the region and Chechen fighters received terrorist training in Afghanistan. Some reports say that about 1,000 recruits passed through these centres. This very nexus between radical Chechen fighters and terrorists has in the eyes of some transformed the mainstream Chechen cause from a movement of national liberation into an anti-Western al-Qaeda like movement.[180]

Ingushetia

In 1992 war broke out between the neighbouring southern Russian republic of Ingushetia and North Ossetia, over the disputed region of Prigorodny. Intense fighting only lasted a week, killing 400 and displacing 40-60,000 Ingush. Russian attempts to broker negotiations have largely failed, and violence sporadically breaks out, especially against Ingush people still living in Ossetia.

Dagestan

During the first Chechen war a number of Dagestani fighters, mostly religious radicals, joined the Chechen side. Partly inspired by this experience, in 1999 they joined with two Chechen warlords and attempted to turn Dagestan into an independent Islamic state. The Russian army crushed them within a few weeks, during which time about 1,000 people were killed. Russia decided that Chechnya was the root cause of the problem, and reinvaded, thus beginning the second Chechen war. Sporadic clashes and bomb attacks continued, both in Dagestan and in Russia, and the republic remains unstable.[181]

1.4.3 Russia and the Persian Gulf countries

In the Middle East only three countries are of major significance to Russia: Iran, Iraq, and Turkey. Iran and Turkey are competitors to Russia in terms of political and economic influence in Central Asia and South Caucasus. At the same time, both countries are important military and economic trading partners

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[180] 'In the Spotlight: The Special Purpose Islamic Regiment', Center for Defense Information (CDI), March 28, 2003, http://www.cdi.org.

[181] Based on private archival research.

with Russia. Iraq owes $8 billion in debt to Russia and Russia hopes that its companies will get shares to develop Iraq's extensive oil reserves.
Saudi Arabia and Israel are of minor interest to Russia. On the one hand Saudi Arabia and Russia have a common interest in maintaining high world oil prices. On the other hand Russia is suspicious of Saudi Arabia, and accuses it of being a major funding source for the Chechen rebels. Israel and Russia have more in common. There are close trade relations and cultural co-operation because of the large Russian-speaking Israeli population who emigrated from the former Soviet Union to Israel. They collaborate in the production and sale of military equipment (e.g. helicopters and AWACS aircraft) to the world market and they have a common interest in protecting themselves against Islamist attacks. A major obstacle to a close relationship between the two however is the co-operation between Russia and Iran in the military and nuclear fields.

Generally, the main Russian policy goals vis-à-vis the mentioned countries include promoting its business interests in terms of oil field development (Iraq), nuclear reactor sales (Iran), natural gas sales (Turkey), sale of weapons systems either legally (to Iran and Turkey) or illegally (to Iraq). Additionally, Chechnya remains a major concern for Russia. As both Turkey and Iran have a great interest in keeping good relations with Russia until now they have kept a low profile in their political position towards the Chechen issue. Since the September 11th attacks Russia has supported US policy and its fight against terrorism. The war in Iraq, however, created a dilemma for Russia: how to keep good relations with the US while also defending its economic interests in the production and export of Iraq's oil resources? When Putin publicly sided with France and Germany against a war in Iraq relations with the US began to deteriorate. Russia's hardening policy against a war in Iraq could have several explanations. First, with the Duma elections shortly ahead and the Russian's public opposition against the war in Iraq, Putin did not want to leave the issue only in the hands of the oppositional communist party. Second, Russia feared that support for the war in Iraq could turn the Russian Muslims against it, particularly in terms of the Chechen war. Third, with France and Germany opposing the war Putin might have hoped that the creation of a Franco-German-Russian bloc might serve to check US unilateralism and strengthen the prospects of a multipolar world. However, if Russia wants to profit economically from Iraq's oil it will have to re-establish its ties with the US.[182]

[182] Amineh, M.P., 'Russian Foreign Policy Toward Iran and Central Asia 2000-2003', forthcoming.2003.

2 The Persian Gulf States, Turkey and Maghreb

2.1 Introduction

The Persian Gulf will remain central to the global oil market in the coming decades. The US and Western Europe, as well as South and East Asia all belong to a single oil market driven by supply and demand. The Persian Gulf owns more than 60 percent of world's oil deposits. Saudi Arabia alone has about 25 percent of the global oil reserves, followed by Iraq with 11 percent, and Kuwait, United Arab Emirates (UAE) and Iran at 9 percent. Although the Persian Gulf countries' world crude market share has declined since the 1970s due to the expansion of oil production in countries outside the Persian Gulf, this decline will not be indefinite. It is expected that between 2010 and 2020 all major oil production will come from the Persian Gulf, not least because of its immense reserve base.[183] With Persian Gulf oil supplies being vital to the world's oil market the quest for a reliable security system in the Persian Gulf has never been more important, particularly since the war in Iraq. It has generally been agreed that political and economic reconstruction in Iraq cannot be carried out in isolation from the rest of Persian Gulf countries, and that it has to be accompanied by a more stable system in the whole region.

Establishing a lasting security system for the Persian Gulf will evolve around three main poles: Saudi Arabia and the other Gulf Co-operation Council (GCC) countries (Kuwait, Qatar, Oman, Bahrain, UAE); Iran; and Iraq. While Saudi Arabia until now has accepted the strategic and political power status quo in the Persian Gulf (it is not clear if it still sticks to this position) both Iran and Iraq have not been content with the existing balance of power and US military presence there. Although Saddam Hussein has been driven away from Iraq no one should be so optimistic as to believe that potential Persian Gulf security threats will easily go away.

The following section considers the political and economic issues of the GCC countries, with a special focus on Iran and Saudi Arabia, and the role of Turkey in the Persian Gulf.

2.2 State Actors

2.2.1 The Gulf Co-operation Council countries

The most distinctive characteristic of the GCC countries, as different from other developing countries, is their sustained access to revenue derived from the production and export of oil and gas. Most of this revenue, however, is in form of rent or royalties for the production and export of the oil and gas resources. In general, GCC countries do not have a well-developed domestic industrial base. In contrast to industrialised countries, the people of smaller oil-rich countries are net consumers of national resources and contribute only marginally to revenues. This results in structural distortions with long-term consequences,[184] budgetary uncertainties, dominance of the public sector, dominance of foreign labour, unemployment, inadequate revenues, absence of popular participation, and lack of accountability.

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[183] Telhami, S., Hill, F., "Does Saudi Arabia Still Matter?', *Foreign Affairs,* Vol. 81, no. 6, 2002, pp. 167-78.

[184] For a detailed analysis of the problem of resource-rich countries' failing to live up to expectations, see Sachs, J., Warner, A., 'Natural resource Abundance and Economic Growth', *The Economist,* December 23, 1995.

National budgets for these countries are contingent on price fluctuations in the oil and gas market. Until now these countries have not been able to manage the price of oil. There is a great dominance of the public sector. Further, the state owns the important means of production and the public sector jealously preserves its prerogatives. Many university graduates opt for careers in the public sector as it is much more convenient and better paid than the private sector. As a consequence, in most of these states the public sector becomes a self-defeating obstacle and is becoming a less reliable career prospect for graduates. GCC countries overwhelmingly rely on foreign workers, which is unique in the world. Foreign workers form 70 percent of the total workforce – almost 90 percent in the United Arab Emirates and Qatar, 83 percent in Kuwait, 60 percent in Bahrain and Oman, and 59 percent in Saudi Arabia.[185]

During the oil-boom of the 1970s, financial resources were too limited and populations too small and lacking in the necessary training and expertise to establish infrastructure and services. Importing labour was a necessary response and since then has become institutionalised. To become more self-reliant in terms of workforce, GCC countries need to implement an extensive reform programme including: better education for national students, reduction in the number of work visas issued, and a levelling of wage/benefit disparity between nationals and non-nationals. Although these reforms could have the expected results in the long-term, for the short-term they would lead to a sectoral labour shortage, inflation, and outrage on the part of powerful commercial interests. Until now none of the GCC governments has been willing to pay this price. As result, unemployment of nationals has become one of the most serious domestic problems for GCC nationals during the 1990s.

GCC country revenues are insufficient for keeping pace with growing costs. In the early days of the oil-boom most of the GCC countries created a social welfare network, the most generous in the world: free medical care, free education, low-cost housing, inexpensive domestic telephone and transportation, and the world's lowest energy prices. Simultaneously, GCC countries actively promoted population growth resulting in a demographic explosion. In 1970 about 45 million people lived in the Persian Gulf countries. By 2001 the number had increased to almost 119 million[186] and by 2010 it is expected to reach 162 million. About two-thirds of the Persian Gulf population live in Iran, but the population of the GCC countries is also steadily increasing.[187] The rapid increase in population without a corresponding rise in oil revenues has pushed budgets into deficit and eroded per capita income.

Because of reliance on oil the social construct in most of these countries very unidirectional and distributive. The state leadership collects the rents from oil and allocates them to the population without their involvement, except for Iran where the elected parliament (*Majles*) intervenes vigorously on issues related to economic policy. Partly, this is also true for the Kuwaiti National Assembly that was established after the first war with Iraq. Generally, the Persian Gulf countries are characterised by a heavy-handed statism with little or no public participation. The absence of elected representative bodies in the Persian Gulf countries (except for Iran and Kuwait) and the fact that all media is controlled by the ruling élite

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185 UNEP, *Global Environment Outlook 3-Past, Present and Future Perspectives,* 2002.

186 World Bank, 'Data by Country', http://www.worldbank.org.

187 World Bank, *Social Indicators of Development 1995*, Baltimore: Johns Hopkins Press, 1996.

leaves little room for the population to show its dissent in a peaceful way. For monarchies, such as Bahrain, the expression of disagreement with the ruling family or the call for the restoration of a constitution and parliament (unilaterally suspended in the 1970s) are punished with the loss of employment, arrest, imprisonment or exile. The fact that the ruling families control state finances in the GCC countries permits no accountability. Huge sums of money have been disappearing for years. Money derived from the sale of oil and duly reported in the balance-of-payment statistics routinely was not mentioned in the oil revenues reported in the state budgets. Some of these funds may have been used for defence or other purposes that went unreported in the state budgets.

The GCC countries are faced with a dilemma. If they maintain their paternalistic statism they risk domestic struggle over resources, a rising and open discontent from the young people who are well-educated, unemployed and attracted to radical Islamist alternatives. If they open their systems politically or economically they will set in motion a process that inevitably will challenge their ruling styles if not their legitimacy. Currently, the GCC rulers stay with the status quo.

2.2.2 Iran

Iran is an important case in point. On the one hand, with the election of Khatami as president in 1997, there was an indication that Iran would gradually accept a more moderate security approach in the Persian Gulf. Iranian moderation in the Persian Gulf region even led to hopes that tentative steps toward co-operative measures such as Confidence Building Measures (CBM) might be taken between Iran and the GCC countries.[188] On the other hand, conservative elements in Iran still favour the spread of revolution, possibly by subversion of moderate regimes in the Persian Gulf, and even in post-Saddam Iraq. Although Iran is militarily weak, it could pose a threat to Persian Gulf security by sea-denial activities with missiles, mines, gunboats, or submarines. This could also pose a threat to the security of oil and gas resources as happened between Iran and Azerbaijan. In August 2001, a dispute between Iran and Azerbaijan over a Caspian oil field almost ended in war. On July 23rd 2001, two Iranian Air Force planes over flew a BP / Amoco survey ship that was developing the *Araz-Alov-Shargh* (Azerbaijani name, *Alborz* is the Iranian name) bloc licensed by Azerbaijan. On the same day an Iranian gunboat entered Azerbaijan's territorial waters and threatened to fire on the survey ship. Iran aims to enforce its own claims on this part of the Caspian Sea. BP / Amoco suspended work in the Araz-Alov-Shargh / Alborz bloc as a result.[189]

Tensions between the US and Iran may pose an obstacle for Iran to play a more active role in the world oil and gas market and may also hinder US-based TNOCs from investing in Iran. In 1992 the Clinton government passed the Iran Non-Proliferation Act extending export sanctions to Iraq and Iran, followed by the Iran-Libya Sanctions Act (ILSA) in 1996 prohibiting investment in the Iranian and Libyan energy sectors. The ILSA was extended in 2001 until 2006. In late 2001, President Bush renewed the law

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[188] Potter, L.G., Sick, G.G. (eds.), *Security in the Persian Gulf: Origins, Obstacles and the Search for Consensus,* New York: Palgrave, 2002.

[189] Olson, R., 'Turkey-Iran Relations, 2000-2001: the Caspian, Azerbaijan and the Kurds', *Middle East Policy,* June 1, 2002.

[190] Lorenzetti, M., 'Oil Industry sees mixed signals on US Iran policy', *Oil and Gas Journal,* April 1 2002.

designed to punish foreign countries or companies spending $20 million or more in Iranian or Libyan oil businesses.[190]
An official US Congress paper speaks about regime change in Iran, thus liberalising and supporting liberal forces in Iran. But the questions is, what does the US government intend to do? In 2002, President Bush said that democratic forces in Iran 'will have no better friend than the United States'. Does this mean that the US still aims to promote democracy in Iran? Or does it rather focus on Iran's nuclear arsenal and potential punishment for harbouring al-Qaeda fighters? These two goals are not necessarily compatible. A democratic Iran might want to have a nuclear program, and attacking Iran's military could have a negative effect on democratic prospects.

Iran is close to becoming a nuclear power. The Iranian government has been secretly building centrifugal facilities close to the town of Natanz which could be used for enriching large quantities of uranium for nuclear fuel – or for weapons. Iranian officials say the facilities are only for peaceful use, but the Iranian government has also refused to sign a protocol that allows for unannounced visits there.[191] Both US intelligence and the International Atomic Energy Agency agree that unless stopped (from the inside or the outside) Iran will have produced one or more nuclear weapons within five years. The nuclear problem in Iran might resolve itself if reformers of the Iranian political élite triumph. However, in the short-term this is rather unlikely. The US has to be aware that a military intervention in Iran could easily backfire on Iranian domestic policies undermining or forestalling the prospects for a 'velvet revolution' in Iran. In such circumstances, Iranian conservatives possessing nuclear weapons will make this worst case scenario even more likely.[192]

2.2.2.1 Iran's political environment

The post-revolutionary political power structure of the Islamic Republic of Iran is based on a theocratic mode of rule or the *velayat-e faqih* (the Governance of Jurisconsult) institutionalised according to the Constitution of 1979 by Ayatollah Khomeini. The political institutions, however, are based on a modern state which finds its origins in the Constitution of 1906. This dualism manifests itself also in the offices of the President and the supreme leader as well as their related institutions, for example the Parliament (legislative branch) versus the Council of the Guardian or the regular military versus the paramilitary forces.

Most state institutions in Iran are weak but personal networks are strong. While there is a formal decision-making system it is often ignored or bypassed in favour of an informal, parallel system. An Islamic revolutionary leadership consisting of Shi'i clerics and religious lay persons controls both the formal and informal power centres in Iran. This leadership is divided into two main ideological factions – left and a right – that yet again are divided into smaller factions.

Generally, we can distinguish between four factions in Iran: the Conservative Traditionalist Right of Supreme Leader Ayatollah Khamenei; the Conservative Modern Right of former President Rafsanjani; the Traditionalist left of current President Mohammad Khatami; and the Revolutionary Left or

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[191] The Bulletin, 'Iran: Scaring the Ayatollahs', *Newsweek,* June 4, 2003.

[192] Pollack, K.M., 'Securing the Gulf', *Foreign Affairs,* Vol. 82, no. 4, pp. 5-7.

Hizbollah. These distinctions refer to respective position on social, economic issues in the Islamic context of contemporary Iran and foreign policies.
Iran's weak position in global politics in general, and in CEA in particular, is partly due to rivalry between different factions of the Iranian political élite. This conflict has direct consequences for the country's foreign policy and makes Iran an unreliable partner for co-operation. The fact that Ayatollah Khomenei after his death in 1989 could not be replaced by an as charismatic and powerful figure – able to sustain a balance between the different factions, the different political approaches of the various groups among the Iranian political élite – has created seemingly non-negotiable divisions.[193] For example, while Khatami strives for a Dialogue between Civilisations, Supreme Leader Khamenei undermines these attempts through continued support of Islamist radical groups in other Muslim countries (such as the Party of God [Hizbullah] in Lebanon, and Zeal [HAMAS] or The Islamic Resistance Movement in Gaza / West Bank) and continues Khomeini's anti-US policy.

In May 2003 a group of 130 members of parliament (of the 290 total members) sent an open letter to supreme leader Ayatollah Ali Khamenei. They warned Khamenei that intolerance of freedom of expression in Iran would cause the country to fall apart. Before it is too late he must choose for the people. In their open letter the members of parliament requested a referendum in which the people could decide on the type of regime for Iran. This can be understood as a radical transformation in recent developments. The reformist faction does not believe anymore in gradual regime change and thus opts for a radical regime change from above.

The letter by the members of parliament came less than a week after almost 200 leading reformist intellectuals had issued a similar warning. Last year President Khatami tried to break the impasse by introducing two bills that would strengthen his power and reduce the power of the unelected conservative bodies. As might have been expected, these bills were blocked by those very same conservative bodies. The reformist faction thus faces a dilemma. A call for a referendum is constitutionally difficult unless backed by the supreme leader, Ayatollah Khamenei, who has no intention to do so. Some parliamentarians call for mass resignation of members of parliament but they are still a minority. There is no organised opposition in Iran. Iranians have no problem in organising themselves in the short-term as has been shown in the recent demonstrations in June 2003.[194] The government admitted that it arrested 4,000 demonstrators, 800 of which were students (thus less than a quarter). The demonstrations in Iran are no longer restricted to a single social group but have developed into a national protest both sociologically and geographically. Demonstrations even took place in the Holy City of Qom.[195] If people become even more frustrated major upheavals may occur as well as a growing support for intervention from the outside.

The London-based Arabic language daily *Al-Sharq Al-Awsat* recently reported that Hossein Khomeini, the grandson of Ayatollah Khomeini, had left Qom to relocate in Iraq's holy Shi"ite city of Najaf in protest against Iran's current regime. Hossein Khomeini called Iran's current regime "the world's worst

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[193] Rahnema, S., 'Clerical Oligarchy and the Question of "Democracy" in Iran', *Monthly Review,* March 2001.

[194] BBC News, May 24th 2003, http://newsvote.bbc.co.uk).

[195] Ledeen, M., 'Looking Toward July 9', July 3rd 2003, *Iran Almanac*, http://www.iranalmanac.com

[196] *Al-Sharq Al-Awsat*, London, August 4, 2003.

dictatorship". He said that Iran's escalating protest movement: "would before long develop into a popular revolution, and soon we would see the great event."[196] Hossein Khomeini has strong ties to some Iranian Revolutionary Guards commanders and members of the Iranian parliament and the Iranian security apparatuses. He stated that he would continue his struggle against the current situation in Iran: "Freedom is more important than bread. If the Americans will provide it, let them come – but the Iranian people are capable of determining the fate of the current regime by itself […] What we need is international sympathy and understanding for our legitimate needs."[197] The newspaper noted that members of the Revolutionary Guards in Iran are now searching for Hossein Khomeini as the Iranian authorities fear that he could become a symbol of resistance to the Iranian political regime.[198]

2.2.2.2 Iran's economic environment

Iranians no longer trust the power of the Islamist ideology. Khomeini's mixture of religion and politics was unable to deliver the promised rewards of prosperity and social justice to Iran. Since the revolution the average annual oil income has risen 100 percent, but most indicators of economic welfare have been deteriorating. Average inflation has been at least twice as high as during the 1970s, unemployment is three times higher, economic growth is two thirds lower. Consequently, Iran's per capita income has declined by at least 30 percent since 1979. According to official documents 15 percent of the population live below the absolute poverty line. Private research has shown that this number might be as high as 40 percent. The ailing economy has put the legitimacy of the Iranian government further into question. A recent study that leaked from the Iranian Interior Ministry shows that 90 percent of the population are is dissatisfied with the contemporary government, 28 percent of which demand 'fundamental' changes in the structure of the political regime and 66 percent desire 'gradual reforms'. Less than 11 percent are satisfied with the contemporary government. The bankruptcy of the Islamist ideology combined with the failure of economic reform, confront the Iranian government with its greatest challenge to its legitimacy since the revolution. Both the public and the press openly question the role of Islam and the concept of the *velayat-e faqih.*[199]

Relations between Iran and Saudi Arabia have been improving since Rafsanjani's reconsideration of Iran's regional policy from when he was President of Iran (1989-1997). At the beginning of 1998 former President Rafsanjani visited Saudi Arabia. This visit had already been planned during his presidency. President Khatami's visit to Saudi Arabia in May 1999 was the first visit of an Iranian president to that country since the revolution.[200] Saudi Arabia and Iran are the largest and second largest producers of oil within the Organisation of the Petroleum Exporting Countries (OPEC). Any change in their mutual relations would have serious effects both on the world energy market and the regional security system. Both countries are suspicious of Israel's nuclear arsenal. Unlike Iran and Saudi Arabia, Israel has not signed the Non-proliferation Treaty of 1995. Both countries also distrust close military co-operation between Israel, the region's most technological advanced state, and Turkey, the only NATO member in the Middle East. In February 1996, Turkey and Israel signed the first of several co-operation agreements, allowing

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197 *Al-Sharq Al-Awsat*, London, August 4, 2003.

198 *Al-Sharq Al-Awsat*, London, July 29, 2003.

199 Amuzegar, J., 'Iran's Crumbling Revolution', *Foreign Affairs,* Vol. 82, no. 1, 2003, pp. 44-57.

200 Reissner, J., *"Iran unter Khatami-Grenzen der Reformierbarketi des politischen Systems der Islamischen Republik".* Stiftung Wissenschaft und Politik, September 1999, pp. 47-49.

Israeli pilots to train in Turkish airspace and in turn, upgrading Turkey's F-4 Phantom and F-5, by the Israeli military.[201] There have even been talks about a Tehran-Arabian axis to counter Turkey and Israel co-operation.[202]

Given the hostile relations between Iraq on the one side, and Saudi Arabia and Iran on the other, the two countries also share concerns and objectives with regards to their policies toward Iraq. To influence political developments in Iraq both countries have maintained relations with groups that oppose the Iraqi regime. Riyadh gave financial support to the Iraqi national Congress and Iran helped to establish the Supreme Council of the Islamic Revolution in Iraq (SCIRI) of Ayatollah Baqir Al Hakim as an umbrella organisation for Iraqi Shi'i parties. Despite a similar stance towards Iraq and Israel there is also conflict between Iran and Saudi Arabia in terms of the Abu Musa, Greater Tunb and Lesser Tunb Islands.[203] In 1992 Iran declared full sovereignty over these islands, located in the Persian Gulf between Iran and the UAE. Disputes over the three islands, however, are unlikely to have a major effect on Iranian-Saudi Arabia rapprochement.

2.2.3 Saudi Arabia

2.2.3.1 Saudi Arabia in the global oil and gas market

Saudi Arabia (including 50 percent of the Saudi-Kuwait 'Neutral Zone') has 264.2 billion bbl of proven oil reserves, more than a quarter of the world total, and 224.7 trillion cubic feet (tcf) of natural gas, the fourth largest in the world. In 2002 Saudi Arabia produced about 8.5 mbbl/d of oil. The country has around 80 oil and gas fields. More than 50 percent of its proven oil reserves are located in only eight fields which include Ghawar, the world's largest onshore oil field, and Safaniya the world's largest offshore oil field. The country's natural gas reserves derive mainly from three gas fields: the Ghawar field, containing one-third of Saudi Arabia's total natural gas reserves, and the offshore Safaniya and Zuluf fields. The country has eight refineries, with a combined throughput of about 1.75 mbbl/d. When a new unit at Ras Tanura is finished toward the end of 2003, the refining capacity will come close to 2 mbbl/d.

Saudi Arabia is a key oil supplier to the US, Europe and Japan. In recent years Saudi Arabia's position in the US oil market has been challenged by other producers such as Venezuela, Canada and Mexico. Asia currently imports 40 percent of Saudi Arabia's crude oil exports and also most of its refined petroleum product exports. The US is the second largest oil importer from Saudi Arabia followed by OECD Europe. In 2002 the US imported 1.55 mbbl/d of oil from Saudi Arabia, ranking Saudi Arabia behind Canada and just slightly ahead of Mexico and Venezuela as a source of total (crude and refined) oil imports. Saudi Arabia hopes to maintain or even expand its market share in the US. In 2002 Saudi Arabia's share of US crude oil imports declined from 17.3 percent in 2001 down to 16.8 percent. Most of the kingdom's crude oil is exported from the Persian Gulf via the Abqaiq processing facility which

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[201] 'Joint Naval Exercise by Turkey-Israel and United States', *Middle East Monitor,* Vol. 28, no. 1, January 1998, p. 5.

[202] Kemp, G., *America and Iran: Road Maps and Realism,* Washington, D.C.: The Nixon Center, 1998, p. 20.

[203] For a comprehensive study of this conflict see Amirahmadi, H., *Small islamds, Big Politics: The Tonbs and Abu Musa in the Persian Gulf,* New York: St. Martin's Press, 1996.

handles about two-thirds of the country's output. Its main export terminals are at Ras Tanura (6 mbbl/d and the world's largest offshore oil loading facility), Ras al-Ju'aymah (3 mbbl/d) on the Persian Gulf and Yanbu (5 mbbl/d) on the Red Sea. The country operates two major oil pipelines: the 5 mbbl/d East-West Crude Oil Pipeline, mainly used for exports to the European market; and the 290,000 bbl/d Abqaiq-Yanbu natural gas liquids pipeline. Energy consumption within Saudi Arabia has climbed dramatically during the last decades. Between 1980 and 2000 energy consumption almost tripled from 1.7 quadrillion Btu (quads) to 4.6 quads – similar to Iran, Turkey and Egypt where energy consumption has almost tripled over the past 20 years. Saudi Arabia accounts for 1.1 percent of world energy consumption.[204]

Domestic gas consumption is encouraged to free additional crude oil exports. Growing domestic demand for gas drives a S$4.5 billion expansion of Saudi Arabia's Master Gas System (MGS), which was completed in 1984. In October 2002 the construction of a $4 bcf per day non-associated gas processing plant at Hawiyah was completed. It reportedly produces enough natural gas to free up around 260,000 bbl/d of crude oil exports. There is also a US$2 billion project to complete a new natural gas processing plant at Haradh by the end of 2003. In June 2000 a key pipeline project was completed which is part of the expansion of the existing gas transmission system in Saudi Arabia including the construction of around 1,2000 miles of additional natural gas pipeline capacity by 2006.[205]

For half a century the US has made the Persian Gulf a primary security interest. This strategy has mainly been driven by the US aim to ensure an uninterrupted flow of oil at a reasonable price and to prevent hostile powers from seizing control of the Persian Gulf oil and gas resources. It is unlikely that this position will change in the near future. Recently, however, US-Saudi relations have increasingly come under pressure, especially given the discovery that 15 of the September 11th attackers were from Saudi Arabia. Further, almost 80 percent of the prisoners held at Guantanamo are Saudis, Osama bin Laden is a Saudi, and al-Qaeda has been financially supported by Saudis and even by the royal family.[206] The 9-11 report stated that Omar al-Bayoumi, a key associate of two of the hijackers, was a Saudi government agent.[207]

The recent decision by Washington to move its 5,000 troops from Sultan Air Base in Saudi Arabia to Al Udeid Air Base in Qatar have added to the tense situation between the two countries.[208] Given persisting US security interests in the Persian Gulf it is likely that US military will retain a large presence there. Keeping good relations with Saudi Arabia will be essential for continued US military presence in the Persian Gulf. It is unlikely that, with the exception of Kuwait, other members of the GCC will accept US military bases without Saudi acquiescence. Saudi Arabia also plays a key psychological role in the Muslim world. The establishment of a radical government employing the pulpit of Mecca, where millions of Muslim pilgrims come every year, setting a hostile anti-US tone would be very unfavourable for the US. At the same time, the US will have to reconsider its own policy priorities if it wants to safeguard

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[204] EIA, 'Saudi Arabia: Environmental Issues', November 2002.

[205] EIA, 'Saudi Arabia Country Analysis Brief', June, 2003, on-line version.

[206] Telhami, Hill, *Op. cit*., 2002, pp. 167, 170; Barone, M., "Our Enemies the Saudis', *US News & World Report,* Vol. 132, no. 19, June 3 2002.

[207] Isikoff, M., 'The 9-11 Report: Slamming the FBI', *Newsweek*, July 28, 2003.

[208] Janardhan, N., 'The Saudi Connection', *New Internationalist,* June 2003, p. 357.

a stable environment in Saudi Arabia that protects its own security interests. In a 2002 survey, 86 percent of the Saudi élite and 59 percent of the general public indicated frustration with US policies. The primary concern for Saudis is the US policy toward the Arab-Israeli conflict. In a survey conducted in spring 2001, 61 percent of Saudis considered the Palestinian situation to be 'the single most important issue to them personally' and 20 percent ranked it among the top three.

Both the US and Saudi Arabia will have to work to regain the trust of each other's policy-makers and publics. Saudi Arabia will have to reform its political, educational, and economic system not only because of domestic concerns but also to improve relations between Saudi Arabia and the rest of the world. If reforms are rejected or fail, pressures from the young, many of whom are unemployed and radicalised, will pose serious challenges both internally and externally.[209]

2.2.4 Turkey and the Persian Gulf countries

Over the last decade Turkey has become an important actor in the Middle East, which it views more as a sphere of risk than a sphere of opportunity. Most importantly this approach is linked to developments in Northern Iraq, Syria, Iran, Israel, Turkey's Kurdish problem, the activities of Islamists in Iran, Saudi Arabia and elsewhere in the Middle East, the spread of weapons of mass destruction and oil and gas needs. Its growing military capability and willingness to intervene in regional areas of conflict to defend its national interests render Turkey a significant regional actor in its own right.

The strategic relations between Turkey and the US have been put to the test with Turkey's unease in accepting the US military on its territory to attack Iraq. This position derived mainly from the same sources as broader international opposition but Turkey had additional reasons. Turkey feared that it could become the focus of regional hostility if it sided with the US. In the context of the September 11th attacks, the anti-American sentiments in the Middle East and the vulnerability if its regimes to such sentiments demanded that Turkey to take a more cautious approach for its own security interests.[210] Before and since the 1990-91 Gulf War, Turkey and Iraq had enjoyed a broad economic and political co-operation. With the closure of the Kirku-Yumurtalik pipeline as well as the sanctions and impoverishment of Iraq, however, Turkey lost its main trading partner in the Middle East and a lucrative source of revenue. Turkey now fears great economic losses as a consequence of the war including for tourism, foreign direct investment, and a general loss of confidence in its economy, as happened subsequent to the first Gulf War. Finally, Turkey at present is predominantly concerned with a domestic programme of political, legal and administrative reforms for EU accession negotiations.

Turkey's strategic relationship with Israel is an important example of its activities in he Middle East. For Turkey co-operation with Israel is based around three issues: (1) the PKK issue and Syria's support for the organisation in the 1990s; (2) difficulties in the transfer of arms from the US and Europe to Turkey; and (3) reinforcement of the strategic relationship with the US through an open co-operation with Israel. The Turkey-Israel coalition also serves shared security concerns such as the containment of Islamism,

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[209] Telhami, Hill, *Op. cit*., 2002, pp. 167, 170.

[210] Park, B., "Strategic Location, Political Dislocation: Turkey, the Unted States and Northern Iraq", *MERIA,* Vol. 7, no. 2, June 2003, pp. 11-12.

counter-terrorism and monitoring and countering the proliferation of ballistic missiles and weapons of mass destruction. Some Turkish population centres are close to systems deployed in Iran, Iraq and Syria.[211] Its Arab neighbours, especially Egypt, and Iran, view the open relationship between Turkey and Israel with great suspicion. Cairo and others have been very critical of the periodic Turkish-Israeli and also trilateral maritime exercises with the US. The deepening crisis in Israeli-Palestinian relations has made the issue of defence co-operation between Turkey and Israel even more contentious in the Arab world.

Turkey has a long history of concerns with Syria that evolve around several points: the claiming of the Turkish province, Hatay, by Syria; disagreement over the share of downstream waters from the Tigris and Euphrates rivers; and especially Syrian support for the PKK. Since Syria, however, in 1998 agreed to expel PKK leader Abdullah Öcalan, its direct link to Turkey's internal security perceptions has been broken. Additionally, because of good relations with Israel, Turkey has a great leverage over Syria which could be beneficial even for economic relations. The policy of rapprochement between the two countries already includes steps toward facilitating cross-border trade and transport. If the trade between Syria and the EU increases in context of the Euro-Mediterranean partnership process, Turkey could become a key link for overland trade between Syria and Europe.[212] Turkish strategists, however, remain cautious about speaking of improved relations between the two countries in light of Syrian chemical and missile developments.

2.2.5 Algeria

2.2.5.1 Algeria's political environment

Political Islam became a discussed issue in Algeria at the end of the 1980s. In 1989 following adoption of a new constitution, the Islamic Salvation Front (*Front Islamique du Salut,* FIS) was legalised. It scored a major victory in the 1990 local and regional elections and when it took part in the 1991 national elections it became clear it would repeat the same success as for the previous year. The army cancelled the elections in early 1992 and took power. The army's intervention in the political process produced a great political crisis in Algeria.

At the height of the Algerian crisis violence claimed about one thousand lives every month. The total number of victims since 1991 might be as high as one hundred thousand. The nature of violence has changed significantly over time. It began with an insurgency dominated urban Islamist movement aimed at eliminating the secular oriented regime and at establishing an Islamic state. The security forces reacted with their own counter-insurgency campaign which for its part claimed many lives and resulted in great human rights abuses. It is widely believed that the security forces themselves have been involved in massacres.[213] The insurgents affiliated with the Armed Islamic Group (*Groupe Islamique Armé,* GIA) and the armed wing of the FIS have been unable so far to overthrow the regime. At the same time, the

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[211] Metehan, D., Morroco, J.D., "Israel, Turkey Eye joint Missile Shield', *Aviation Week and Space Technology,* July 16 2001.

[212] Larrabee, F. S., Lesser, I.O., *Turkish Foreign Policy in an Age of Uncertainty,* Santa Monica: Rand, 2003.

[213] See the analysis in 'War Torn Algeria: The Dawn of New Era?" *HSS Strategic Comments 6,* no. 2, 2000.

security forces have been unable to eradicate Islamist terror. Although a limited amnesty in 2000 was successful in reducing the number of active insurgents the situation is still tenuous, especially in the countryside.

Since the late 1990s violence has become more diverse and less directly political. It is no longer a battle between insurgents and the government, rather violence in Algeria has gained a more personalised and chaotic character driven by vendettas, family and village rivalries, struggles between factions of all parties involved, and economic opportunism.[214] The current violence may not directly threaten the existence of the current military-backed regime but it makes finding a political solution for the crisis more difficult.

When President Abdelaziz Bouteflika came to power in 1999, he initially benefited from his reform program especially outside of Algeria. Large segments of the Algerian population voted in favour of a referendum held on September 16th, 1999 according to which Bouteflika would make an end to the violence. However, he continues on a difficult path between the hard-line and more moderate factions within the Algerian government and the Algerian society as a whole. Confronted with a hostile press and a parliament in which he has little support, Bouteflika adopted an extremely authoritarian political style that worsened his political and media difficulties. His inability to end the Islamist insurgency and to attract foreign direct investment persists. It is rather unlikely that compromise with more moderate Islamists will be reached and that the security situation will stabilise. In part this is due to the military's declaration that it will not accept any Islamists in a future government.[215] The two leaders of the FIS, Abassi Madani and Ali Belhadj, who were jailed in 1991 were quietly set free on July 2nd 2003. It is not yet clear if the freed leaders will pose a threat to the Algerian government. Currently, the FIS is in no position to reconstitute itself as a party. First because it is still illegal and second, it has lost many of its supporters. Its armed wing surrendered in 2001 in exchange for government amnesty and many supporters have been traumatised by the violence of the past decade.[216]

In its regional politics Algeria has its own security concerns. When the political crisis began in 1991 the Algerian government stressed the role of Iran, Sudan, Afghanistan and other countries in supporting Algerian insurgents. In this context, competition with Morocco is significant. Many Algerians believe that Rabat has taken advantage of the Algerian crisis to strengthen its position in the Western Sahara where Algeria also has important interests. It is also believed that Morocco was involved in the infiltration of insurgents and weapons along the border with Algeria.

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[214] On the economic argument see particularly Martinez, L., *The Algerian Civil War 1990-1998,* New York: Columbia University Press, 2000.

[215] Roberts, H., 'Dancing in the Dark: The European Union and the Algerian Drama, *Democratization,* Vol. 9, no. 1, Spring, 2001, pp. 106-134.

[216] 'Algeria's Islamist leaders', *Economist,* July 12, 2003.

2.2.5.2 Algeria's economic environment

While Algeria's political situation remains problematic its economic situation is more promising. There are different reasons for this. First, high oil and gas prices bolster revenues in an economy that is mainly dependent on the export of its oil and gas resources. Currently the hydrocarbon sector accounts for 96.4 percent of total exports and 60 percent of government revenues.[217] New fields are developed, pipelines are constructed and as the oil and gas sector has been largely unaffected by the political crisis in Algeria thus far, foreign investors have been willing to undertake new projects even at the height of the political crisis. Second, the more stable political situation has attracted investors from Europe and the US even outside the oil and gas sector. Third, relations with the IMF have improved due to Algeria's economic reform and privatisation program. However, there are still obstacles, as Algerian officials are unwilling to compromise on matters of state sovereignty and the dominant role of the state in the hydrocarbon sector.

2.2.5.3 Algeria in the global oil and gas market

Algeria owns 160 tcf of proven gas reserves ranking it in the top ten world-wide. The national company Sonatrach estimates that Algeria's gas potential is as high as 204 tcf of gas. Algeria's largest gas field is the Hassi R'Mel which has proven reserves of about 85 tcf accounting for around 1.35 bcf per day, which is a quarter of Algeria's dry gas production. The rest comes from associated and non-associated fields in the southeast and from non-associated reservoirs in the Salah region in southern Algeria. Gas is transported through pipelines via Tunisia and Sicily to the Italian mainland as well as through a pipeline via Morocco to Cordoba, Spain. Other pipelines are planned, for example a pipeline to Italy via Sardinia. Algeria's proven oil reserves are estimated at 9.2 billion bbl.

The largest oil field in Algeria is the Hassi Messaoud field located in the centre of the country containing about 6.4 billion bbl of oil, about 70 percent of Algeria's proven oil reserves.[218]

According to an official study, hydrocarbon export could rise as much as 50 percent in the coming four years, particularly because of an increase in gas production. The Algerian government noted that when the imminent Ohanet project comes on stream it will add up to 6 million cubic meters to Algeria's annual gas production. When the In Sahala project starts in the second half of 2004 it will raise total gas production by an additional 9 billion cubic meters per year followed by an additional 9 billion cubic meters from the In Amenas gas project in the beginning of 2005. The Algerian government is also very eager to expand its oil production capacity. In July 2003 it rose 1.2 mbbl/d and is expected to be as high as 1.5 mbbl/d by 2005 and 2 mbbl/d in 2010. However, it will need large-scale foreign investments to reach this goal. [219]

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[217] 'Algeria', *Global Insight-Quarterly Review and Outlook,* Third Quarter, 2003.

[218] EIA, 'Algeria Country Analysis Brief', January, 2003.

[219] 'Algeria', *Global Insight-Quarterly Review and Outlook,* Third Quarter, 2003.

2.3 Matrix of risks in the Persian Gulf and Maghreb

2.3.1 Turkey: The Kurdish problematic

An important issue in the Iraq war for Turkey is the Kurdish problematic. Turkey feared that a Kurdish revolt in Iraq might encourage Kurds in Turkey to strive openly for independence. By the end of December 2002, 55,000 Turkish troops were stationed at the northern Iraqi border. Turkish military resistance to being placed under US demand clearly indicated, both to the US as well as the Kurds in Iraq, that Turkey would act independently of the US if needed.[220] To establish some common understanding with the Iraqi Kurds to prevent the emergence of a possible Kurdish enclave in Iraq Turkey stressed its close ties to Turkic kinsmen in the region such as Senan Ahmet Aga, head of the Iraqi Turkoman Front (ITC). Aga argued that his people numbering between 500,000 and three million were discriminated against in the Kurdish Democratic Party (KDP) zone where they lived. He said that for any future federal arrangement his people should enjoy the same rights of self-government because of their different ethnicity – rather than being integrated into a Kurdish zone. This argument is particularly important, as according to Aga, about 60 percent of Turkomen live in the Kirkuk region of northern Iraq, which is rich in oil.[221]

In 1984 the Kurdistan Workers Party (*Partiya Karkeren Kurdistan* or PKK now Kurdistan Freedom and Democracy Congress or KADEK) began an armed struggle for an independent Kurdistan. About 20 percent of the Turkish population are Kurds most of whom live in southern Turkey. The 15 years of armed conflict has caused more than 30,000 deaths, most of them Kurds and non-combatants. The unilateral PKK cease-fire, established in 1999-2000 remains precarious, as Turkey has been widely accused for human rights abuses against Kurds. Turkey fears that the two main Kurdish political parties in Iraq (the Kurdistan Democratic Party [KDP] of Massud Barzani, and the Patriotic Union of Kurdistan [PUK] of Jalal Talabani) striving for independence subsequent to the collapse of the Saddam regime could have a great impact on the Kurdish population in Turkey and also Iran. This could result in Turkish military involvement in northern Iraq.

2.3.2 Iran

The Supreme Council for the Islamic Revolution in Iraq

After 23 years of exile in Iran, the Ayatollah Mohammed Baqir Al Hakim, leader of the SCIRI – the most important Shi'i opposition movement of Iraq – in May 2003 returned to Iraq. On August 29th 2003 he was killed together with about 100 people by a car bomb explosion during Friday prayer in the city of Najaf. It is not yet clear who carried out this attack. It is speculated that elements loyal to the old Saddam Hussein regime were responsible. Saddam Hussein regarded the Shia with suspicion and brutally suppressed them. Another possibility is a tactical alliance between Saddam Hussein loyalists and Islamist militants who have entered Iraq over the last few months. Since the overthrow of the Saddam regime, Iraqi Shia have been in dispute over whether or not to co-operate with the US. The two leading Shi'a groups, the Daawa Party and Ayatollah Hakim's SCIRI, are critical but ready to co-operate with the US. This view has found heavy opposition by a group led by a radical young Shia figure, Muqtada al-Sadr,

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220 'Turkey deploys Troops Near Iraqi Border', and 'Kurds Deny US Military Buildup', *TDN,* December 17, 2002; 'General Staff Denies Reports of Extraordinary Buildup on Iraq Border', *TDN,* December 19, 2002.

221 Oruc, S., 'Iraqi Turcomans Concerned About Security', *TDN,* March 18, 2002.

who is suspected to have carried out earlier attacks on Shia clerics, but until now has denied his involvement in any of them. The Shia comprise about 60 percent of the Iraqi population.

The bombers may be Iraqi nationalists or non-Iraqi Sunni Islamists, or even an unholy alliance of the two. If security is to be established, the US and its allies present in Iraq must ensure that the mainly Shia south remains free of serious violence. At the same time, as the Shia is the biggest community in Iraq it must be successfully integrated into the country's new political structure. For the short-term, the assassination creates an obstacle to that development.[222]

The Mujahedin-e Khalq (MEK or MOK)

Possible civil war and instability in Iran could lead to direct confrontation with the Mujahedin-e Khalq (MEK or MOK). The organisation has several thousand fighters based in Iraq with an extensive overseas support structure. Most of the fighters are organised in the MEK's National Liberation Army. An important recent development is the Iranian Mujahedin cease-fire with the US since the overthrow of the political regime in Iraq. The US can use the Mujahedin to exert pressure on the Iranian government. It can be said that the Iranian Mujahedin now fulfils the same role for the US as the Afghani Mujahedin during the 1980s. Some members of the US Congress view the Mujahedin as a group that could establish a secular regime in Iran like that of Turkey. It is also planned to take the Mujahedin off the list of terrorist groups.

2.3.3 Saudi Arabia

Per capita income in Saudi Arabia fell between 1981 and 2001 from $28,000 to $6,800. The country has one of the highest birth rates in the world. The police force is corrupt and the country has the highest rate of public beheadings. The royal family spends, according to some estimates, 50 percent of its total revenues on defence – mostly for personal protection. Islamist preachers all over Saudi Arabia call openly for a *Jihad* against the West including the Royal family itself. The mosque schools in Saudi Arabia have become a breeding ground for militant Islam. The attacks in Bali, Bosnia, Chechnya, Kenya, and the US as well as against US military personnel within Saudi Arabia all point back to these schools and to the Royal family. The House of Saud, afraid that Islamist radical groups might start an uprising against the Royal family pays protection money to these groups and attempts to direct their attention to other countries. For example, in 1997 a high-ranking member of the royal family co-ordinated an amount of $100 million in aid packages for the Taliban.[223] According to Canadian intelligence estimates Saudi-based charities funnel between $1–2 million a month to al Qaeda.[224]

The Saudi regime, however, might also be vulnerable to Islamist attacks. A possible scenario suggests that if terrorists simultaneously hit only a few sensitive points (those controlling 10,000 miles onshore and offshore pipes) of the major field's oil systems, they could put Saudi Arabia out of the oil business for about two years.[225]

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[222] Hardy, R., 'Attack points to new alliances', *BBC World,* August 29th, 2003.

[223] Baer, R., 'The Fall of the House of Saud', *The Atlantic Monthly,* May 2003.

[224] Zuckerman, M., 'Who finances the fanatics?', *US News & World Report,* Vol. 133, no. 25, December 30, 2002.

[225] Telhami, Hill, *Op. cit*., 2002, p. 53.

A rupture in the US-Saudi Arabia relationship could induce Saudi Arabia towards developing a nuclear arsenal, which it could build up relatively quickly. To develop its nuclear arsenal Saudi Arabia could turn to Pakistan, North Korea or even China (which sold the Saudis missiles in the 1980s). Iran's progressing nuclear program in particular might also turn Saudi Arabia in that direction. According to Patrick Clawson, deputy director of the Washington Institute for Near East Policy, "Saudi Arabia is the state most likely to proliferate in response to an Iranian nuclear threat."[226] The recent US decision to remove most of its military forces from Saudi Arabia and thereby withdraw its protection of the country at a time when regional rivalries are intensifying could push Saudi Arabia even further towards a nuclear program. This would cause concern for Turkey.

2.3.4 Algeria

Algeria's political crisis has continued for more than ten years, and has caused concern for Western, and especially European and French observers. In particular, there has been fear of government collapse and a subsequent emergence of an Islamic regime. Currently, this fear may seem exaggerated, but at the beginning of the 1990s it was taken very seriously.[227] Another debate in this context is centred on the question how an Islamic regime would behave in international relations. Particularly because of Algeria's size, its resources and nuclear ambitions these questions became central to discussions on Mediterranean security and policy particularly for Southern Europe but also for the US government.

Oil and gas supply security is also a major concern for European countries, especially Spain, Portugal, France and Italy – all increasingly reliant on the import of Algerian gas. Via pipelines, Spain imports 75 percent of its natural gas from Algeria, Portugal (through Spain) 100 percent and Italy 54 percent.[228] Unlike oil, gas is essentially a regional commodity having limited scope of adjustment in the event of disruption. There are thus reasonable grounds for worry about a safe supply, although until now, gas flow from Algeria to Europe has not been disrupted seriously.

Another worry is the spill-over of Islamist terrorism outside Algeria's borders affecting security in Europe and the US. Algerian Islamists were responsible in the mid-1990s for civilian bombings in Paris and an attempt to hijack a plane and crash it into the Eiffel Tower. The failure of destroying the Eiffel Tower led to the idea of destroying the Twin Towers in New York. But at that time, no one listened.[229] In late 2002 and early 2003 more than 50 people were arrested in four European countries, suspected of having connections to Osama bin Laden's al-Qaeda network. Many of those arrested were Algerians. It is now feared that a North African network of al-Qaeda is being formed and preparing to act. Until now al-Qaeda recruited individuals in Europe with no connections to active terrorist organisations in the Middle East. If there are connections between the arrested and Algerian Islamists then al-Qaeda could have access to infrastructure and a social base it has not had before.[230]

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[226] Cited in Levi, M., 'Royal Pain – Will the Saudis Go Nuclear?', *The New Republic,* June 2, 2003.

[227] See, for example Fuller, G. E., *Algeria: The New Fundamentalist State?*, Santa Monica: Rand, 1996.

[228] ICG, 'Algeria's Economy: The vicious circle of oil and violence', *ICG Africa Report,* no. 36, 2001.

[229] Messud, C., 'Perverse rage of the oppressed: Claire Messud on the lessons of Algeria, home to many of those recently arrested as suspected terrorists, and a country where the passion and ruthlessness of al-Qaeda was foreshadowed 50 years ago', *New Statesman,* February 3, 2003.

[230] Boston, W., 'In Europe, terror trail leads to Algeria', *Christian Science Monitor,* January 28, 2003.

3 Venezuela

Venezuela, a founding member of OPEC, is an important supplier to the United States. With oil production equalling 2.9 mbbl/d in 2002 and total proven crude oil reserves approaching 78 billion barrels, in addition to the significant very heavy oil reserves in the Orinoco belt, the importance of Venezuelan oil production is considerable. Additionally, Venezuela has large natural gas reserves, at 148 trillion tcf, and plans to increase its natural gas output considerably over the next decade.[231]

The power struggle between Venezuelan president, Hugo Chávez, and his political opponents continues to dominate Venezuelan politics, and has a detrimental impact on the domestic oil industry. This industry is dominated by state oil company PDVSA. Control of the company is one of the issues at stake in the country's political power struggle. What is transpiring, however, is more than bickering between different power groups. As a national oil company (NOC), PDVSA has been trying to diminish the level of state control executed over it, in an effort to operate more like a private oil company.[232] Differences of opinion extend also to the question of whether international investors should be allowed into the Venezuelan hydrocarbon industry. While PDVSA desires international participation, the national government for several years has attached more importance to the notion of national sovereignty of its resource industry.[233] The oil industry also is a very important employer and has a dominant position in the national economy. Thus, there is much at stake for the government in maintaining a controlling voice over the NOC.[234] The oil company wants to remove the checks and balances imposed on it by the government, in order to operate more effectively in an international environment. At the time of the OPEC production cutback in 1999, for example, it became clear that the government had decided it was expedient to follow OPEC quota, while PDVSA opposed a cutback in production.[235]

Domestic instability hit a peak during the two-month general strike, December 2002–January 2003. As a result of the strike, oil output dropped to a low point of under 40,000 bbl/d, from a previous high of 3.2 mbbl/d. In reaction to this, the government fired almost half of PDVSA's 40,000 employees. While the government prevailed, after a failed but internationally condoned coup attempt, and reasserted its grip on PDVSA, oil production yet to return to the levels of November 2002. Regardless, the government's official output figure stood at 3.3 mbbl/d in August 2003. According to the IEA, the actual output level was 2.25 mbbl/d.[236] The government appears to be overstating its output level in a bid to reaffirm its competence. Foreign companies are unwilling to commit themselves in new exploration and development activities because of political uncertainty. They now produce 1 mbbl/d. Without new exploration and sufficient maintenance, oil output could fall by as much as 25 percent per year, as old wells become

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231 BP, *Statistical Review of World Energy,* 2003.

232 Van der Linde, C., *The State and the International Oil Market-Competition and the Changing Ownership of Crude Oil Assets*, Studies in Industrial Organisation, Boston/Dordrecht: Kluwer Academic Publishers, 2000, p. 7.

233 Van der Linde, *Op. cit.*, 2000, p. 13.

234 Van der Linde, *Op. cit.*, 2000, p. 24; *The Economist*, "With us or against us?", September 13, 2003, p. 52; *Financial Times*, "Venezuelan oil producer in financial turmoil", August 6, 2003. Oil provides 75% of export earnings and 30% of government revenue.

235 Van der Linde, *Op. cit.*, 2000, Chapter 4.

236 IEA, *Monthly Oil Market Report,* September 2003, p. 14.

depleted.[237] The current political situation in Venezuela may prevent the outside investment necessary to increase or even sustain Venezuelan output levels.[238] As a result of the strikes, PDVSA is in financial disarray.[239] The relationship between Chávez and PDVSA remains troublesome. The president can appoint the chairman of the oil company, but as the strikes have shown, this does not guarantee total control.

4 West African Oil Producers

During the past years, West Africa's role as an oil producing and exporting region has been increasing. The region, including OPEC member Nigeria, produced 3.8 mbbl/d in 2002. Reserves are over 30 billion barrels.[240] Production is expected to rise as a result of continuing investment schemes by TNOCs in Nigeria, Angola, Equatorial Guinea and Chad. Angola's production capacity especially is expected to increase significantly.[241] West Africa currently provides 15 percent of US oil imports. This figure is expected to grow to 25 percent in the next ten years.

São Tomé and Principe, a small island state off the coast of Equatorial Guinea, seen as a future oil producer, experienced a coup attempt earlier this year. In 2002, the US expressed its desire to create a new naval base on São Tomé.[242]

4.1 Nigeria

Nigeria is the biggest regional oil producer. Several TNOCs are involved in considerable development and production projects. Its offshore section is growing in importance. There are plans to develop LNG plants, which would give Nigeria a considerable role in the Atlantic LNG market.[243] Civil unrest, partly fuelled by popular concerns over the way in which oil revenues are spent, hampered oil production earlier this year. Because of strikes, and sabotage, nearly 0.8 mbbl/d of production capacity had to be shut in.[244] Civil unrest looms on the horizon for the foreseeable future.

In their strife with the central government, the Ijaw people of Nigeria have repeatedly occupied oil production platforms, threatening to blow them up if their demands were not met. The oil companies are also under attack, as protestors demand greater compensation from oil companies, and an increase in the number of locals contracted by them.[245] During the 1990s, conflicts between oil companies and village communities escalated.[246] Political unrest for the last two decades focuses also on issues of minority representation and religion.[247]

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[237] *The Economist*, "Chavez's battle to keep oil flowing", August 2, 2003, p. 48.

[238] EIA, *International Energy Outlook,* 2003, p. 38.

[239] *Financial Times*, "Venezuelan oil producer in financial turmoil", August 6, 2003.

[240] BP, *Statistical Review of World Energy,* 2003.

[241] EIA, *International Energy Outlook,* 2003, p. 39.

[242] BBC News, http://news.bbc.co.uk/2/hi/business/3074381.stm;
http://news.bbc.co.uk/2/hi/business/2210571.stm.

[243] *Petroleum Economist*, October 2002, p. 36.

[244] *Petroleum Intelligence Weekly*, March 31, 2003, p. 3.

[245] *Jane's Intelligence Review*, "Terrorist threat to energy infrastructure increases", June 2003, pp. 9, 12, 13.

[246] Frynas, J.G., "Corporate and state responses to anti-oil protests in the Niger Delta", *African Affairs*, Vol. 100, 2001, p. 27.

Because of its growing production capacity, analysts argue that Nigeria is likely to demand a bigger OPEC quota in the near future. After the cutbacks, due to take effect in November 2003, Nigeria's quota will be 2.018 mbbl/d.[248] Consequently, with both the government and locally present TNOCs wanting to maximise revenues made possible by their investments, it is yet to be seen if Nigeria will oblige the latest OPEC decision.[249]

[247] Kane, O., "Réflexion sur les émeutes interconfessionnelles du nord du Nigeria", *Politique Étrangère,* Vol. 3, 2002, p. 749.

[248] http://www.opec.org

[249] *Financial Times*, "Cut in output may test OPEC unity", September 26, 2003.

Annex 2

Consumer States

The US

China

Japan

India

1 The US

The US has a unilateral approach to international affairs: energy issues are perceived as of vital national interest, and private sector resource development is strongly supported, in conjunction with a market system approach to the economy. In the aftermath of the September 2001 terrorist attacks, the American government has adopted a pre-emptive stance in dealing with perceived threats to its interests,[250] examples of which can be found in Afghanistan and Iraq.

1.1 Energy consumption figures

Oil: the US is a major oil producer and the world's biggest consumer. In 2001 production stood at 7.7 mbbl/d, consumption at 19.6 mbbl/d, with oil providing nearly 40 percent of total primary energy demand. Oil imports derive mostly from Canada, Mexico, Venezuela, Saudi Arabia and other Middle East countries. Domestic production is quite expensive compared with production in other countries, and even though proven reserves amount to 30.4 billion barrels, production is not expected to rise significantly in the near future. Consumption is expected to grow at a rate of 1.5 percent per year.[251]

Natural gas: the US accounts for 3.2 percent of world reserves (177.4 tcf), and 22.5 percent of world production (53 bcf/d). Consumption stands at 59.6 bcf/d (25.6 percent of the world total, all figures for 2001). Total North American consumption is expected to grow 2.1 percent per year until 2020,[252] meaning that without new discoveries, natural gas will run out within the next ten years. In order to satisfy growing demand, new LNG terminals are under construction or are being planned. With demand outpacing additional supplies, prices are increasing, and the US government predicts a limited ability to augment natural gas supply over the next 12 to 18 months.[253]

1.2 Energy issues

The American LNG market is growing in volume. Increasing usage is already causing gas shortages on the American market, causing prices to rise sharply. With domestic gas reserves comparably small and gas consumption on the rise, an increase in LNG intake seems only logical. However, the American sense of vulnerability could be an obstacle. The US views LNG trans-shipments as possible targets for terrorist attacks.[254] In October 2001, LNG tankers were banned from the Boston harbour for a three-week period. This could happen again on short notice.

Recently there have been profound differences of opinion between the US and its allies of the so-called Old Europe. This may be an indication of deteriorating transatlantic relations, and shifts in attitude between these two blocks. The US and Europe could become true competitors, making cooperation via organisations such as the OECD or IEA increasingly difficult. A sharp deterioration of diplomatic relations could result in a large, maybe world-wide, competition for energy resources between consumer states.

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250 Rhodes, E., "The Imperial Logic of Bush's Liberal Agenda", *Survival*, Vol. 45, no. 1, 2003, p. 135.

251 EIA, *International Energy Outlook 2002*, <www.eia.doe.gov>.

252 Ibid.

253 Abraham, S., US Secretary of Energy, *Financial Times*, 11 June 2003, p. 3.

254 <www.newportthisweek.com/News/2001/1018/Harbor/011.html>

1.3 US energy strategy

The world's largest energy importer seeks to enhance its security of supply through diversifying supply according to source. Thus, the US imports crude oil from more than 60 different countries, making any oil exporting country part of the US national interest.[255] The US accepts rising oil imports,[256] but is worried by the domestic fragility of key energy-producing countries. It is forecasted that by 2020 half of all world oil supplies will originate in countries that have a high risk of internal instability.[257]

With energy related issues considered to be of vital interest, the US government actively supports its TNOCs in overseas exploration and development initiatives as long as these are in accordance with US foreign policy objectives. Amelioration of bilateral relations with Iran and/or Libya could convince the US government that the Iran Libya Sanctions Act (ILSA or D'Amato Act) has become obsolete. Suspension of ILSA would open these countries to US foreign direct investment (FDI), creating a larger supply of oil and natural gas on world markets in the long run. Linkages between energy and politics, such as ILSA, causes a blurring of the difference between American TNOCs and US government policies in the eyes of producer countries. Relations with producer countries, especially those in the Middle East, will continue to be a policy priority for the US government. US policy thus far has hampered the investment possibilities of US TNOCs, by blocking their entrance into Iranian, Libyan and other countries' energy industries.[258]

The US unilateral stance is apparently in defence of its national interests. Unilateral behaviour combined with a strong presence in all regions of the world enables the US government to act in all kinds of circumstances. Also, intense US presence in newer energy regions, such as Central Asia, could help to ensure creation of a level playing field for TNOCs in those regions. The US government fears however that US military or economic presence would cause degrees of anti-Americanism.

The US government has published documents explaining its energy policy. In prioritising domestic energy security, and refraining from applying significant conservation methods or a massive shift towards coal, nuclear or renewables, US hydrocarbon energy consumption will continue to grow. With a supply side focus, US government backing of important infrastructure projects abroad will continue, such as the Baku-Tbilisi-Ceyhan Main Export Pipeline, and development schemes, by US or affiliated TNOCs. If completed, this pipeline will be the most important result of American entrance into Caspian affairs, together with its military presence in Central Asia. US strategy in this area is aimed at limiting Russian influence over Caspian exports, and excluding all Iranian influence. Thus, Russian-Iranian cooperation is opposed, especially for nuclear ventures such as the Bushehr reactor. Some analysts understand this relationship as a logical consequence of geographical conditions.[259] And, in any case, relations between the US and Russia have improved over the years.

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[255] Ebel, S., <www.csis.org/africa/0208_SudanEbel.pdf>.

[256] The US Senate is currently debating legislation that would mandate that the US administration develop and implement measures to reduce US overall oil demand by 1 mbbl/d from the amount projected for 2013. See *Oil & Gas Journal*, June 23, 2003, p. 40.

[257] CSIS, *The Geopolitics of Energy into the 21st Century*, p. xvii.

[258] Marcel, V., & Mitchell, J.V., *Iraq's Oil Tomorrow*, RIIA Paper, April 2003, p. 1.

For diversification of oil supply or LNG imports, relations with Russia are of particular interest for the US. If Russia assigns a certain quota of exports to the US, the overall amount of freely traded Russian oil will decrease. Even though Russia has a questionable record concerning investment projects by Western TNOCs, throughout the years it has been a very reliable oil exporter, not letting politics determine oil export levels.[260] Events in 2001 and 2002 seemed to place US and Russian oil interests on par. Commentators argue that this could only happen because of high oil prices in 2002,[261] and because of the US' search for reliable suppliers. Also, Russia's goal to increase its oil production to 9.5 mbbl/d by 2010 will require the US market.[262] Good intentions notwithstanding, it is debatable to what extent intergovernmental relations could influence the business conditions in Russia's oil sector. The newly found friendship between Russia and the US could be rigorously tested were oil prices to fall significantly. Another possible point of friction is the issue of Iraq owing Russia somewhere between US$7–12 billion. Bickering around repayments could hamper future US-Russian relations.[263] The attacks on US territory in September 2001 caused a shift in US thinking concerning the security of its energy supplies. Supplies from the Middle East, but also from the former Soviet Union, are tainted by uncertainty of access. Political unrest raises questions about Venezuela and Nigeria. Recently, according to the US' Energy Information Agency (EIA), technological innovation has made the recovery of Canada's huge oil sands deposits economically viable. The presence of huge amounts of recoverable oil sands in a neighbouring, stable country is a great asset for US energy supply. There is an amount of 175 billion barrels of known recoverable reserves according to the *Oil and Gas Journal*, and up to 315 billion barrels according to other sources.[264] Canada now provides 15 percent of US crude oil imports. Under a business-as-usual scenario, with oil prices at US$20 per barrel, oil sands production will represent approximately 60 percent of Canadian oil production by 2010.[265] Alberta, the province in which the bulk of the oil sands are to be found, wants to apply for OPEC observer status, bypassing the Canadian central government.[266] In the event of a long-lasting serious disruption of international oil flows, development of the oil sands could be accelerated. Canada can thus be seen as a safety net for the US and due to its geography for the US only.

Since the Clinton administration, the US government has tried to break-up OPEC. In recent history, by creating a degree of stability and short-term predictability on the world crude oil market, and by allowing prices to stay relatively high at their expense, OPEC has actually benefited American domestic oil producers. OPEC's dissolution could wreak havoc with TNOC profits, reduce incentives for exploration and development, and destabilise oil producer countries, including Russia.[267]

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259 Victor, D.G., & Victor, N.M, "Axis of Oil?", *Foreign Affairs*, Vol. 82, no. 2, 2003, p. 61.

260 An exception to this was compliance with the 2000 OPEC cutbacks, although Russia made only a slight cutback.

261 Ibid, p. 49.

262 Legvold, R., "All the Way. Crafting a U.S.-Russian Alliance", *The National Interest*, Vol. 70, 2002, p. 23.

263 Victor & Victor, *op. cit.*, 2003, p. 50.

264 Thus surpassing Saudi Arabia. See: <www.planetsave.com/ViewStory.asp?ID=3692>.

265 <www.westernoilsands.com/pdf/TDReport.pdf>

266 <www.oilworks.com/New/c032803.html>

267 Blank, F.E., "Political Economy and Gulf Oil", *Nuova Geopolitica,* Vol. 2, no. 9, 2003.

In an effort to reduce import dependence, the US government is preparing legislation to allow drilling on protected lands, such as the Arctic National Wildlife Refuge (ANWR) in Alaska. Alaskan output is now hovering around 1 mbbl/d. According to the US government's National Energy Policy, full-scale exploration and development of the ANWR could add 1–1.3 mbbl/d to US production.[268] This however will not diminish US import dependence in any significant way. The TAPS pipeline system, and the whole of US domestic energy infrastructure, is regarded as a national security concern. Policy initiatives have been made in two domains. First, legislation concerning information disclosure on the energy infrastructure has been enacted, for example in the Freedom of Information Act. Also, government and industry are now obliged to cooperate on matters of security guidance and vulnerability assessments. Companies must prepare government-approved security plans for their facilities.[269]

Finally, the US government has become worried about its domestic natural gas supplies. Domestic gas production cannot satisfy demand, and it is accepted that domestic potential is generally too small, making LNG imports a necessity. With low storage levels and limited LNG import facilities (even though they are being expanded), gas prices are very high, raising consumer and political concerns.[270]

1.4 US behaviour in Iraq

Taking temporary physical control of the Iraqi oil fields does not improve American energy supply security *per se*. As Marcel and Mitchell explain: "the crucial requisite for energy security is to get the oil on the market and to prevent any disruptions of supply. In terms of the energy security of importing states, it is irrelevant who sells the oil and who buys it. Oil is a global commodity and the price is not set in Baghdad."[271]

The US is attempting to establish a democratic Iraq, in the hopes that similar developments would thus be stimulated in Saudi Arabia and Iran. The idea is that Iraq will open its oil sector to FDI, and that more oil will become available on the world oil market. After installing an interim oil minister, Thamer al-Ghadban, whose official title is CEO of the interim management of the oil ministry team, US officials have been closely cooperating with Iraqi officials in the (re)start-up of the Iraqi oil industry, in both Kirkuk and the southern regions. In this relationship, the Americans are in charge, but Iraqi cooperation is indispensable because of knowledge and experience, manpower, and as a first step in creating an independently operating Iraqi oil industry. The Coalition Provisional Authority (CPA), a three-man body chaired by US oilman Philip Carroll, decides how oil revenues are spent.[272]

The Iraqi oil ministry enjoys a certain amount of autonomy, but the US makes the most important decisions. The ministry has nullified several contracts made between oil companies and the Hussein regime. Among these are LUKoil's West Qurna deal (600 kbbl/d), Syria's SPC Nur field deal (50 kbbl/d) and CNPC's Al-Ahdab contract (90 kbbl/d). Vietnam's PetroVietnam is going forward with the development of the 80 kbbl/d Amara field. "The US has made overhauling operating fields a priority and says that

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[268] US Government, *National Energy Strategy*, pp. 5-9.

[269] *Oil & Gas Journal*, June 23, 2003, pp. 20-30.

[270] *Oil & Gas Journal*, June 23, 2003, p. 41.

[271] Marcel & Mitchell, *op. cit.*, 2003, p. 1.

[272] *Petroleum Intelligence Weekly*, Vol. 42, no. 23, June 9, 2003, p. 8.

only an internationally recognised Iraqi government can initiate development of new fields. […] This policy effectively freezes out, for the indefinite future, countries that were pursuing multi-billion barrel oil projects with Saddam Hussein, including Russia, France and China."[273]

2 China and Japan

2.1 Researching Chinese sources on energy security

Throughout the 1990s there was a significant increase in Chinese open publications on national security strategy – displaying a diversity of opinions going far beyond the first decades of the PRC. Researchers at some elite universities and (government) research institutes are well-acquainted with foreign (mainly US) publications on International Relations, International Political Economy and security-related theories. The impact of traditional (socialist, Marxist) theories of imperialism seems less relevant than the interpretations of US security strategies which assume a lasting impact such as by Alfred T. Mahan and Halford Mackinder (geopolitics) on US long-term strategies towards Eurasia. Governments tend to couch their foreign strategies in terms that emphasise the government's ability to pursue an active and independent strategy, and the Chinese advocacy of global "multi-polarity" also serves this goal. Chinese security policies, especially those directly related to energy security, cannot mechanically be deduced from theoretical writings. Chinese publications are even more veiled than those of most other countries in terms of engaging open discussion of policy options involving issues of national security. Specialists referring to options and scenarios that go counter to publicly announced strategies of the

Chinese government tend to use media which are either not generally accessible to the public (*neibu*[274]), or which include such remarks in book-length publications in an inconspicuous manner. There is general reluctance to air non-authoritative debates in foreign language publications (such as in English). On the other hand, Chinese authors often prefer to quote foreign sources when presenting data or information concerning China since this avoids any risk of revealing confidential information (state secrets) to the general public. The preference for particular data and sources may provide clues to policy preferences.

2.2 A summary of China's strategic situation

The collapse of the Soviet Union, India's strategic reorientation, the active strategies and interventions by the US in Eurasia, and changes in the pattern of oil and gas production and consumption in Eurasia and Pacific Asia, have all forced China to repeatedly rethink its security and energy strategies. India's acquisition of nuclear capability and gradually increasing economic growth – due to economic reforms as well as conspicuous improvements in relations with the US – have transformed India into a potential rival of China. US global power allows the US to pursue long-term (energy) security strategies, in which short and medium-term coalitions with other powers play an important tactical role. China makes use of temporary tactical cooperation with the US to pursue long-term interests, but its means of pursuing active long-term strategies are limited. This summary argues that throughout this period China has little choice but to remain on the strategic defensive. The search for energy supplies and stability in China's larger neighbourhood (Korea, Southeast Asia, Central West Asia, the Gulf Region) cannot be achieved

[273] *Petroleum Intelligence Weekly*, Vol. 42, no. 22, June 2, 2003, p. 1.

[274] It should be noted that this term is usually no longer used as synonymous with secret or confidential.

by actively opposing US initiatives in these areas. Although hardly ever spelled-out in public, China is highly apprehensive about Japanese reactions to the coming energy crunch and the instability on the Korean Peninsula. A significant increase in Japanese strategic military capabilities in the Japan Sea, China's off-shore regions, and the Indian Ocean would vastly complicate Chinese maritime security strategies.

Periodisation

During 1992–1998, China attempted to build a network of bilateral relationships (strategic partnerships) with countries in the large region (south)west of China, including institutions designed to increase stability and energy security (Shanghai Cooperation Organization [SCO]).[275] Examples of this are China's relations with Kazakhstan and Iran. Anticipating a dramatic increase in China's oil dependency on the Middle East prior to the critical period around 2020 when global demand for oil is expected to vastly outstrip supplies China has sought to secure advantageous deals with countries such as Iraq and Sudan. China's links with countries the US accuses of supporting terrorism are most likely not an attempt to counter global US strategies.[276]

During 1998–2001, the US began to distance itself from the Taliban and Turkmenistan, and subsequently conducted a major air campaign in Iraq. The US strategy towards North Korea displays a considerable hardening, while condoning the rise of India as a declared nuclear power. It is, however, US intervention in the Balkans (Kosovo) that forms a focal point for China's re-evaluation of US global strategies, probably because Chinese analysts perceive parallels with the Soviet intervention in Czechoslovakia (1968).[277]

From 2001–present, the US wars in Afghanistan and Iraq significantly complicate China's relations with Pakistan and Iran, weaken China's relations with some Central Asian countries, and reduce China's prospects for using relations with Iran and Iraq to strengthen stable oil supplies from the Middle East. Some Chinese writers argue that China will need to adopt a much more active strategy in oil producing regions, although it is seldom spelled out what form this can or will take.

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[275] A fairly comprehensive survey of the organisation is available in *Shanghai hezuo zuzhi. Shin anquanguan yu xin jizhi* ("The Shanghai Cooperation Organization. The New Security Concept and a New Regime"), Shishi Publishers, Peking, 2002.

[276] On China's apprehension about fundamentalist inspired terrorism, see for instance *Guoji kongbuzhuyi yeu fankongbu douzheng* ("International terrorism and the anti-terrorist war"), Shishi Publishers, Beijing, August 2001; Jin Yijiu and Wu Yungui (eds.) *Isilan yu guoji redian* ("Islam and international hot spots"), Beijing, August 2001; Hu Lianhe *Dangdai shijie kongbuzhuyi yu duice* ("Contemporary terrorism and countermeasures"), Beijing, October 2001.

[277] Chinese analysts and journals display a wider variety of different analyses and policy proposals than is sometimes assumed. Representative impressions of Chinese non-official strategic thinking can be gleaned from books by Zhang Zhaozhong (Defence University, Beijing) and the journal *Zhanlue yu guanli* ("Strategy and Management"). Michael Pillsbury is an influential advisor to President Bush concerning China's military role. His work, *China Debates the Future Security Environment*, January 2000, National Defense University Press, Washington, DC, is very useful, but his interpretations of Chinese military sources are not always reliable.

2.3 Chinese energy statistics

Future Chinese oil and gas production projections, as well as estimates of future total Chinese energy demand and energy imports differ significantly, depending on different assumptions across a wide variety of factors such as projected economic growth and financial/technical feasibility of mineral exploration.[278] In general, figures for projected Chinese energy demand published by the American EAI and the IEA tend to be higher than those of Chinese research institutions such as the *Zhongguo nengyuan yanjiusuo* (China Resources Research Institute). The EAI and IEA figures for future Chinese domestic energy production are significantly lower than Chinese estimates.[279]

Scenarios

With regards to China's involvement in Caspian Sea energy resources, Wu Lei[280] offers three scenarios. The most optimistic one is also the most likely, namely that Caspian oil will fully enter international energy markets and simultaneously have a large impact on international oil geopolitics. The reasons given for this include financial and other commitments Western governments and multinational companies have already made, and their strong motivation to provide political and military protection for oil and gas supply lines. Although Russia has oil interests in the region it is too weak to enter into powerful competition with Western countries in Russia's Central Asian backyard. Even if Iran does not consider improving its relations with Western countries it is not sufficiently strong to endanger Western exploration. Last but not least, oil exploration has created a web of interrelated actors and interests that is no longer driven by one or two major oil companies.

The second scenario assumes the opposite outcome, namely that conflicts of interest will rise to such a degree that compromise is longer possible. Wu considers this to be the least likely scenario.

The third scenario predicts a tortuous road towards full-scale development that will impede the full-scale production necessary for entering global markets. Major negative factors include potential disputes over territorial/maritime rights, ethnic, religious, independence struggles as well as terrorism.

Caspian oil has a major impact on China's oil exploration, since it attracts investment that will impede oil and gas exploration in China's western territories. However, from a wider perspective, Caspian oil offers a welcome possibility of supply diversification from Middle East dependency. Kazakhstan and Turkmenistan are territories neighbouring China with whom China has close relations. Although exploitation costs are high they are preferable because of greater political stability compared with the Middle East.

Wu suggests that China should settle treaties as quickly as possible for projects in Kazakhstan to establish foundations for deepening the relationship as much as possible. China should also provide production technology and services. Building an eastern pipeline offers a key strategic role for China, especially in the long-term perspective. This will enable Kazakhstan to enter global oil markets and China to

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[278] For a comparison of statistics relating to China, see A.M. Jaffe and S.W. Lewis, "Beijing's Oil Diplomacy", *Survival*, Vol. 44, No. 1 (Spring 2000).

[279] In addition to fn.4, see Wu Lei, *Zhongguo shiyou anquan*, pp. 116 ff.

improve its supply of Caspian oil. These factors justify the high capital costs of the projects, including constructing more than one route, in particular the Turkmenistan route.

China also ought to actively support cooperation between Iran, Kazakhstan and Turkmenistan to construct a line from the Caspian eastern coast through northern Iran to the Persian Gulf. This would link supply routes from Central Asia and the Middle East beneficial for China, and would make Middle Eastern supplies safer. China should thus exert much energy in encouraging the US and Iran to improve relations, including removal of US economic restrictions against Iran. China should also actively engage and take part in Central Asian and Caspian regional affairs to increase stability and establish a network of stable and friendly relations with Central Asian states.

China must view diplomatic oil strategy as an organic whole comprising Central Asia, Russia and the Middle East. In this vein, China should encourage the new Central Asian states to balance their relations with the US and Russia, and increase cooperation between China and Russia. Since Russia is currently on the strategic defensive in this area, China should ally with Russian oil companies to jointly enter competition for Caspian oil and gas to counter Western influence in Central Asia.

The new Central Asian corridor would offer a continental corridor to the Persian Gulf, thus increasing China's geo-economic space. China should see the region as free from clashes, rather than as a fragmented area. In the same vein, the SCO must be strengthened to help coordinate struggles against cross-border crime, terrorism and independence movements, especially since the latter may have a very serious impact on China's oil supplies. China also needs to strengthen research on the impact of the US war in Afghanistan, since the latter also impacts China's oil exploration in Central Asia. Through the Afghanistan war, US influence has entered the great area of Central Asia and China, causing a new challenge to China's oil supplies from Central Asia. This ought to induce China to rethink its strategies toward Central Asian oil.

Wu also treats in detail the implications of large diversity in the rapidly increasing demand for oil and gas in other large Asian countries, including Japan and India. He does not foresee likelihood of a sudden major oil crisis such as in the 1970s, but the increasing dependence of (East) Asian countries on the Persian Gulf engenders the possibility of a new oil cartel. Wu refers to the well-known absence of commercial and strategic oil reserves in Pacific Asian countries. Mutual competition prevents cooperation such as established among Western consumer countries, and all kinds of actions ought to be taken to offset the market power of oil exporting countries and reduce oil prices. There is considerable concern that any cut off of oil supplies from the Persian Gulf after 2005 may pose a serious threat to the political and economic stability of numerous Asia-Pacific countries.

The increasing presence of Asia-Pacific countries in the Middle East will unavoidably impinge on Western influence and interests in the region. On the other hand, the political and economic dependence of numerous Middle Eastern countries will gradually turn from the West towards East Asia. The lack of a unified energy strategy among East Asian countries may continue to produce conflicts and contradictions among East Asian countries unfavourable towards the maintenance of Middle Eastern politics and economics, nor will this be beneficial to the stability of the whole complex of resource supply stability.

2.4 Energy supply and Japan's national security strategy

Presenting an outline of Japanese energy (security) strategy is not made easier by the widespread assumption that Japan is weak on strategic thinking – an assumption that is consistently supported by similar pronouncements of Japanese leaders, and repeated in authoritative reports.[281] Recently, Japan has been extremely active in efforts to persuade Russia to renege on its (virtually closed) deal with China giving priority to the construction of a pipeline to Daqing in North China, and rather to first embark upon the construction of a pipeline to Nakhodka – a decision with extremely important implications for the future position of Japan and China in the Northeast Asian energy market.[282] In a reverse development, Japan may lose out in its attempt to clinch a deal for the exploration of one of the world's largest oil fields, Azagedan, in Iran. Prime Minister Koizumi's cabinet reshuffle saw the appointment of Shoichi Nakagawa as Minister of Economy, Trade and Industry, who indicated a greater willingness to accede to US pressure to forego the deal in the face of US attempts to force Iran to give up its nuclear plans.

Japan's wavering energy strategy is partly due to its vulnerability to foreign pressure, but also to weaknesses in domestic policy encumbering development and implementation of consistent long-term strategies. Surprisingly little is known about specifics of policy decision-making, especially the interaction of the bureaucracy, business (in its widest meaning), politicians and specialists in various areas. This applies in particular to issues such as energy security as well as others considered sensitive by Japan's allies and/or neighbours – including the US, South Korea, and China.[283] On the other hand, Japan's cabinet decided in July 2003 to invest considerable funds and organisational efforts to link government institutions and private companies, in an attempt to intensify exploration of the continental shelf, extending the area recognised by the United Nations as part of Japan's exclusive economic zone. Although reported in Asian media[284] the reaction of Japan's neighbours to this initiative was unexpectedly low key.

One of Japan's most prolific and often quoted authors on security strategy, Okazaki Hisahiko (former ambassador to the United States and a long-time official involved in intelligence evaluation), recently argued that US and British intelligence were so superior that Japan could and should basically rely on Anglo-Saxon intelligence efforts. This statement does not suggest either significant intelligence gathering or assessment capability, a vital foundation of independent strategic thinking.[285] Combined with the relatively strong tendency of most Japanese media to avoid reporting that might damage national interest, it is not surprising that numerous analyses rely heavily on official policy statements that are not very helpful in specifying actors and interests (interest groups) likely to have a major impact on future strat-

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[280] Ibid.

[281] This was one of the main points in the report of a task force for the Japanese cabinet published on November 28, 2002.

[282] International news sources have provided widely different and conflicting accounts.

[283] A brief, but excellent introduction on the topic is by Professor Mito Takamichi of Kyushu University, Fukuoka "Japan's Energy Strategy, Russian Economic Security, and Opportunities for Russian Energy Development: Major Issues and Policy Recommendations", presented at Rice University, May 2000, available at: <http://www.rice.edu/projects/baker/Pubs/workingpapers/jescgem/jesres9/jesres.html>.

[284] As reported in Chinese, Taiwanese and Korean media on or after July 5 (for an example, see the Taiwanese *Zhongguo shibao*).

egy.[286] This is particularly the case when vital Japanese interests conflict with Japan's Asian neighbours, China, Korea, but also India, the three countries that have a vital stake in ensuring their rapidly increasing energy imports. Perhaps the most central issue for Asia as a whole is the search for an institutional framework that allows China and Japan to compete and cooperate peacefully in a global environment where all major actors in Asia have different relationships with their Asian neighbours, the US and the European Union.[287]

Russian energy export strategies are not only based on economic criteria, such as obtaining maximum price for exports in the long-term, and domestic actors such as Gazprom and its rivals with frequently conflicting interests. Rather, Russian (energy) strategy is also deeply linked with its overall security relationship with those countries as well as the US, Europe, and other energy exporters such as Iran and Iraq. Russia's energy (security) policies towards its Asian neighbours remain in flux and difficult to predict – the latest example being uncertainty over whether Russia will build a pipeline towards Nakhodka (as desired by Japan) or Daqing in China, a decision with long-term strategic implications for the whole Northeast Asian energy complex. Given that Japan's relations with Russia have been troubled by a long history of war, competition, friction, antagonism and territorial disputes (over the Russian-occupied Northern Territories claimed by Japan) the eventual outcome is not easy to predict.

Since the middle of the 1990s there have been numerous attempts to establish an organisational framework to reduce the likelihood of struggle for energy resources among Asian nations to the east of Pakistan by promoting Asian energy co-operation projects. Japanese organisations have played a significant role in initiating dialogue such as the Northeast Asian Energy Co-operation Project.[288] The adoption of a co-operative approach coincides with the observation of US energy security specialists who maintain that despite numerous dire predictions of future resource wars, events of recent years are actually pointing towards increasing international co-operation rather than preparation for military conflict over resources.

Japanese foreign policy is not a simple echo of US strategy and compliance with US demands – differences with the US over policies towards Iran and the Gulf states date from the 1950s and became more

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[285] Okazaki Hisahiko, *Nihon gaikoo no joohoo senryaku* ("Intelligence strategy in Japan's foreign relations"), PHP Books, 2003.

[286] There is a strong tendency in published Japanese research reports to rely heavily on seemingly objective statistics that give less emphasis to sensitive questions of policy interpretations. See, for instance, "Study on Northeast Asia's Energy and Security: Perspectives and Issues Related to China's Supply and Demand for Energy" (in Japanese, with a brief English summary), NIRA Research Report No. 19990125.

[287] A recent comprehensive study on the shape of Japanese and Chinese cooperation and competition in a global environment is *Chuugoku no seiki. Nihon no senryaku* ("China's Century. Japan's Strategy") edited by Samejima Keiji, Japan Center for Economic Research, 2002 (Nihon keizai shinbunsha Publishers). See also Greg Austin and Stuart Harris, *Japan and Greater China*, London, 2001.

[288] Together with many others, Abe Susumu, Advisor to the Toshiba Corporation, has frequently pleaded for such an approach. He also supported the initiative of the Economic Research Institute for Northeast Asia (ERINA) in Niigata. See "Energy Security and Sustainable Development in Northeast Asia: Prospects for Cooperative Policies", a report by Vladimir I. Ivanov with Eleanor Oguma, 2002 of the International Workshop held in Khabarovsk, September 17–19, 2002.

pronounced during the 1970s. During the first half of the 1980s Japan played an often overlooked mediating role during the eight-year war between Iran and Iraq that proved devastating for both countries. Yet when it comes to vital questions of the protection of energy supplies, in particular from the Middle East, Japan can be expected to side with the US. Japan's political, if not military support for the US during the latest Iraq war was not only induced by Japan's desire to assure US protection against North Korea, but also by the (natural) awareness that the US role in the Middle East remains pivotal for the security of Japanese energy supplies, even at the risk of damaging Japan's reputation as a "non-white, non-Christian" state in the public opinion of states with a large Islamic population.[289] Japanese co-operation with the US in the Gulf and the Middle East is not designed to compete with China in the area of energy supplies – but since China's strategy emphasises energy supplies from Iran, Iraq and Sudan, amongst other, following US strategies has the additional advantage of creating greater difficulties for Chinese energy strategies.[290] The US follows complex strategies towards Russian energy links with the European Union, China, Japan, and Russian partners such as Iran and Iraq, but so far there seem to be no major disagreements on basic energy strategies towards Russia between Japan and the US.

As noted above, both China and Japan participate in a number of organisations that are engaged in increasing stability in energy markets in the Asian Pacific (East Asia and Southeast Asia) and Pacific Asia (including countries in the Americas bordering on the Pacific as well as Australia and New Zealand), such as the ASEAN Plus Three Organisation, and APEC. The US participates directly in APEC, but ASEAN Plus Three has sometimes been portrayed as a more exclusive Asian organisation reducing the importance of the US in Asian affairs. Although Japan has been active in both organisations, and rather belatedly also engaged in promoting the establishment of Free Trade Zones and Areas (as with Singapore), these initiatives are unlikely to result in structures supporting a Japanese leadership role for Japan at the expense of China.[291]

Many specialists have pointed out that the lack of coordinated energy policies throughout Northeast Asia (and Asia in general) will result in an important future comparative disadvantage for Asian economies in competition with the US and the EU. Establishing an Asian energy region however will not be effectively designed by imitating concepts of economic co-operation as in Europe or the Americas. More promising is an emphasis on specific energy projects in which countries in the region participate, both at the level of industry but also including state actors, since such projects do not necessarily require deeper regional political co-operation that is fairly unlikely in the medium-term. This also side-steps the issue of hierarchically designed leadership in Asia. However, whether practical cooperation takes place in the

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[289] This point is seldom stressed out of regard for Japan's Western partners, although some Japanese politicians are frank about this in publications and talks intended for a Japanese audience (as is the case with Suematsu Yoshinori, a former diplomat with postings, among others, in Baghdad).

[290] Again, this is a rather sensitive topic. The US upholds a public strategy of global open energy markets to achieve greater stability for all. There are indications, such as the report published by William Pener, that some US actors are in favour of singling out some Chinese, Sudanese and other energy producers to prevent them from attracting necessary foreign investment.

[291] As Ogawa Yuhei has remarked, South Korea is unlikely to engage in a Free Trade arrangement with Japan unless China is and remains involved – and this seems to apply to the ASEAN nations as well.

short, medium or long-term, the governments involved need to develop new strategic concepts for long-term cooperation that are not mere adaptations of American or European models. National strategies need no longer imply that Japanese or Chinese companies are forced to follow narrow policies devised by government – as is the case elsewhere, Japanese oil and energy companies are not often at loggerheads with the wishes of their own government. Rather, national governments should provide a reliable framework that allows actors from an energy sub-region such as Northeast Asia to operate efficiently throughout the region.

So far, Japan and China have been extremely cautious to avoid competition in the energy sector becoming a disturbing factor impeding the development of their overall economic relationship, which is the core of the Asian economic region. There is a major incentive to establish frameworks for orderly competition, but new and more efforts will be needed to prevent the Sino-Japanese relationship from taking a negative turn. Energy markets and supply sources operate globally and cannot be structured in the framework of a (Northeast) Asian sub-region, such as competition over the Angarsk pipeline and the contract for exploitation of the Azadegan oilfield. Russian energy supply strategies extend over the whole of the Eurasian continent and cannot be conceptualised regionally. The same may be said of Asia's largest energy consumers, China and Japan. As a consequence, China and Japan have to strengthen the *global* character of their energy (security) strategies.

China and Japan's future strategic options:

1. Most likely China will continue to follow the present mix of increasing interaction with the global economy by participating in multilateral energy exploration and distribution. At the same time, it strengthens its network of strategic partnerships (*not* alliances) with individual countries (Russia) and participation in institutions such as the Shanghai Cooperation Organization that focuses on anti-terrorist struggle and energy security.

2. If major Chinese energy companies fail to operate successfully in assuring rapidly increasing energy imports, China is likely to strengthen its efforts to establish preferential relationships with major suppliers such as Russia and Iran at the government level. This would require China to dramatically increase its energy investments in these countries, or provide other advantages to Russia and Iran instead. This option is not attractive since it exposes China to considerable political risk. Also, such an approach is likely to be perceived as unfriendly by Japan and the US.

3. Japan's options can best be described in terms of level of cooperation with the US and the degree to which Japanese energy strategies may differ from US global strategies. As illustrated by Japan's dilemma in negotiations with Iran over the Azadegan oilfields, Japan's energy interests may conflict with those of the US. Japan, however, is in a weak position versus the US since none of Japan's neighbours on the Eurasian continent is able to take over part of the US function of "stabiliser of last resort" for Japan's global economic and energy security.

4. Japan may attempt to increase room for manoeuvre by strengthening cooperation with the EU on specific energy projects as long as this is not perceived as ganging up with the EU against the US.

3 India: Energy strategy and risk assessment

India is a net energy importer, and with a growing population and continued economic growth, its energy consumption is growing accordingly. India has a state approach to the energy sector, but its New Exploration Licensing Policy allows FDI by TNOCs in greenfield projects. Self-sufficiency in oil and gas will not be reached. Consequently, energy imports have become a vital interest for the Indian state, but it is still considered of secondary importance compared to Indian relations with Pakistan. This forestalls any serious negotiation on the possible construction of a gas pipeline stretching from Turkmenistan to India via Pakistan.

3.1 Energy consumption figures

- Oil consumption: 2001 production stood at 782,000 bbl/d; consumption amounted to 2.07 mbbl/d[292], and is expected to reach 3 mbbl/d in 2010. The transport sector is responsible for 70 percent of the rise in oil demand;[293]
- Energy Intensity (2001E): 25,307 Btu/$1995 (vs. U.S. value of 10,736 Btu/$1995);
- Gas consumption: 2001 production stood at 2.6 bcf/d, with consumption amounting to 2.5 bcf/d;[294]
- Coal satisfies more than half of India's energy demand.

3.2 Energy issues

Security of supply measures can become tangled with other national interests. Several LNG plants are being constructed to address India's predicted growth in gas demand in the near future. Government policy decisions have caused a few of these projects to be halted. India could easily link up with Bangladesh's gas grid, and thus import Bengali gas, but there are no plans to do so. Construction of new power generation plants, running on gas, is expected to boost gas consumption. Yearly consumption growth is predicted at 6.1 percent, to a total of 2.7 tcf (7.4 bcf/d) by 2010. Potential pipeline construction from Turkmenistan via Pakistan to India, to transport Central Asian gas, can only be undertaken when relations between India and Pakistan have considerably improved. This also hampers the construction of pipelines transporting gas from Iran to India. For an increase in the long-term use of gas, attracting sufficient funds for LNG projects and cross-border pipeline construction may prove to be a huge problem. Indian proven oil reserves stand at 5.4 billion barrels. Domestic production could increase sharply, but only if TNOCs decide to commit themselves to large-scale investment projects. In a business-as-usual scenario, India's oil import dependency will grow from 65 percent in 2000, to 94 percent in 2030[295] (a total of 5.6 mbbl/d).

The gradual opening up of the domestic energy sector is likely to continue. India's role on the world energy markets is that of an energy importer. Weak state oil companies and absence of Indian TNOCs will make India vulnerable to future world market developments. India's weight on the international energy markets is limited, and there are no major Indian oil companies comparable in size to BP or ExxonMobil. Rising Indian imports however will have a discernible impact on the world energy markets.

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[292] BP, *Statistical Review of World Energy*, 2002.

[293] IEA, *World Energy Outlook*, 2002, p. 292.

[294] BP, *Statistical Review of World Energy*, 2002.

[295] IEA, *World Energy Outlook*, 2002, p. 285.

Annex 3

Issues

Globalization, security and international order after September 11th

The Kyoto protocol

Euro Or USD-Denominated energy bills

Choke points risk assessment

1 Globalisation, security and international order after September 11th

The changes in International Relations during the last decades and the attacks of September 11th as a serious event in these developments suggest a rethinking of the state-centric approach towards security. National security as the primary focus of public policy should be replaced by human security (including issues of development and equality). What is needed is not a security concept based on the construction and defense of boundaries between states or a categorization of 'us and them' but rather a globalized conception of security that relies on the creation of transnational security communities which develop based on widely accepted norms, values, interests and identities.

In a world characterised by transnational networks military might is no longer the only means to safeguard security. Further, the traditional state-centric way of thinking fails to recognise that states are interwoven in a complex web of institutions.[296] These institutions on the one hand deliver them great benefits but on the other hand constrain their autonomy and confront them with new systemic vulnerabilities. Finally, it was generally believed that the September 11th attacks were only possible because of state sponsorship. The collapse of the Taliban regime, however, made clear that the Taliban had been dependent on the al-Qa'eda movement, a transnational Islamic network, rather than the other way round.[297] This also leads to the conclusion that combating such non-state actors by freezing their financial resources could be more effective than targeting the military capacity of such a movement.

The economic, political and military inequalities that exist today in the world are not the result of competition for power between states but of transnational processes and relations. To understand the complex forces that make up and threaten the world of today we need a conceptual framework to identify the sources of inequality and resistance to it.

Globalisation is not only accompanied by time-space compression[298] and global culture but has also initiated a process of fragmentation, stressing difference and heterogeneity.[299] Globalisation undermines the relative autonomy of the state. There is a shift of authority upwards toward supranational authorities, and sideways toward non-state, transnational actors that increasingly attain a prominent position for regulating cross border activities.[300]

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296 Ikenberry, G.J., *After Victory: Institutions, Strategic Restraint, and the Rebuilding of order after Major Wars*, Princeton: Princeton, 2001.

297 See for example Gaffney, F., "Waging the New War on Terrorism', *National Center for Policy Analysis,* Brief Analysis no. 374, October 4, 2000.

298 Harvey, D., *The Condition of Postmodernity: an Enquiry into the Origins of Cultural Change*, Oxford: Blackwell, 1988.

299 Clark, I., *Globalisation and Fragmentation: International Relations in the Twentieth Century,* Oxford: Oxford University Press, 1997.

300 Strange, S., *The Retreat of the State: the Diffusion of Power in the World Economy,* Cambridge: Cambridge University Press, 1996; Cutler, A.C. et.al., (eds.), *Private Authority and International Affairs,* New York: State University Press of New York, 1999.

Two key aspects of the post Second World War world order in general and the US role in particular help us to better understand the connections between globalisation, security, and September 11th. International Relations (IR) and International Political Economy (IPE) teach us that the US is bound up with, dependent on and also partly constrained by a complex of institutions, ideas, relationships, and practices to create an outlook on the international order.[301] In contrast to the Roman Empire that carried out unrestricted hegemony over its territory the US is embedded in interdependent transnational networks of power and interest. Another important key issue is the prevalence of the realist and neo-realist approach in US security policy. According to these approaches the only way to respond to threats in the international system is to secure national borders by military means. But just as 'balance of power' exists because some policy-makers think it exists, so too are the existence of threats, such as rogue states and the appropriate responses to them, socially constructed. Thus, neo-realist security approaches are unable to help understand and develop strategies for dealing with the world of today.

Since the end of the Cold War, states and non-state actors have assigned more significance to economic and resource concerns. Conflicts over the control of global oil and gas become more probable as global oil and gas consumption and imports rise, environmental conditions deteriorate, availability of oil and gas decreases, and prices for these commodities rise. Internal conflicts over oil and gas could arise in countries where these are the main source of income. Resource competition could be accompanied by ethnic hostility, economic injustice, and political competition – factors, which are linked to disputes over the control of oil and gas resources.

2 The Kyoto protocol

Fear of global warming has spurred governments world-wide to ratify the Kyoto Protocol. Under the Protocol, the EU has committed itself to an average reduction of 8 percent of greenhouse gas (GHG) emissions below 1990 levels by 2008–2012. In this way the Protocol acts as a complicating factor in the EU's search for improving its energy supply security, given that it forms a strong incentive to further discard coal, regarded as a secure fuel, as a primary energy source. The Kyoto Protocol is a protocol of the UN Framework Convention on Climate Change, itself adopted in 1992.[302] The Kyoto Protocol was agreed upon in 1997. In its subsequent agreements, targets for greenhouse gas emission reduction were set for the EU, US and Japan. The EU (named the European Community) ratified the Protocol in 2000.

In their search for energy supply security in the long run, European contingency planning does not contemplate any temporary abandonment of Kyoto Protocol emission reduction targets, even if this would enhance the energy supply situation in the event of a crisis. In any case, the Kyoto framework could be embraced as an opportunity to further support research on renewables and as an incentive to increase the share of renewables in the total energy mix. Renewables can be produced domestically, which reduce threats to a country's energy supply security originating in the transport of primary energy carriers or in the production of primary energy carriers in third countries.

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[301] See Hardt, M., Antonio, N., *Empire,* Cambridge (Mass.): Harvard University Press, 2000.

[302] *International Legal Materials*, Vol. 31, 1992, p. 849; Shaw, M.N., *International Law*, Cambridge: Cambridge University Press, 1999, p. 612.

2.1 The current state of affairs

The EU has not yet succeeded in reaching the Kyoto Protocol GHG reduction levels to which it has committed itself. The above-mentioned 8 percent reduction in greenhouse gas emissions entails a cutback of CO_2 emissions by 336Mt per year. With regards to the monitoring mechanism and the EU's emission trading scheme, the EU considers itself to be proceeding on schedule. Even though energy demand measures are reportedly well on track,[303] CO_2 emissions of passenger cars were up 18 percent in 2000 compared with 1990. This figure is expected to rise to 28 percent in 2010, as the number of cars is expected to further increase.

For electricity production, EU legislation prescribes that member states enhance the share of renewables from 13.9 percent (1997) to a target of 22 percent in 2010.[304] The Commission also adopted measures aimed at enlarging the share of biofuels in the transportation sector to 5.75 percent in 2010, resulting in an overall annual saving of 17.5 Mtoe.

In addition, the ECCP holds that full liberalisation of the electricity and gas markets, with increased competition between different energy sectors will favour flexible, less capital intensive and smaller scale production. This will, in their opinion, cause a shift from coal to gas, further reducing CO_2 emissions.[305]

Table 2.1 CO_2 Emissions by type of fuel[306]

Oil	20 Mg carbon per TJ	264 g CO_2/kWh
Natural Gas	15.3 Mg carbon per TJ	202 g CO_2/kWh
Lignite	28.5 Mg carbon per TJ	381 g CO_2/kWh
Bituminous	25.8 Mg carbon per TJ	340 g CO_2/kWh

2.1 The legal pendant of the protocol

The Protocol seeks to establish construction of a legally binding compliance mechanism, with easy-to-check parameters. A legal branch will serve as a judicial-like forum to judge Annex I parties' performances, and shall be entitled to apply appropriate, predetermined consequences if it deems so necessary.[307] Article 18 of the protocol provides that "binding consequences" of non-compliance may be adopted only by a Protocol amendment. This indicates the inability of the Protocol parties to agree at the time of its enactment upon the issue of non-compliance. The Conference of Parties (COP), the highest body of the UNFCCC, has left it to the future governing body of the Kyoto Protocol, the COP/MOP,[308] to concen-

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303 European Climate Change Programme (ECCP), *Second ECCP Progress Report. Can we meet our Kyoto Targets?* April 2003, p. i. Http:// europa.eu.int/comm/environment/climat/eccp.htm

304 Ibid, p. 48.

305 ECCP, *Op. cit.*, 2003, p. 54.

306 Source: IPCC, as quoted in Germanwatch/LBST Working Paper 2002, p. 5.

307 This was agreed upon at the Marrakech Accords. Wiser, G., *Report on the Compliance System of the Marrakech Accords to the Kyoto Protocol*, UNFCCC, December 7, 2001, p. 2. So far, no real *sanctions* mechanisms have been created.

308 COP/MOP: The Conference of the parties serving as the meeting of the parties of the Kyoto Protocol.

trate on the question of whether, when, or how an Article 18 legal instrument might be adopted. The COP must nevertheless approve a preparatory draft of the COP/MOP.

All Parties must accept the authority of the enforcement branch to verify whether they fulfil certain eligibility criteria for participating in joint implementation (Art. 6), the Clean Development Mechanism (Art. 12), or emissions trading (Art. 17). It is unclear how this rule will be applied once these mechanisms become operative.[309] "Under international law, the extent to which something is legally binding depends primarily upon the expression of political will by the states party to international agreements like the Kyoto Protocol. There is no way to *force* parties who exceed their target to remedy the problem. Trade sanctions have sometimes been used in an attempt to enforce action. This is not contemplated in the Kyoto regime at this time."[310] The CEC has proposed a scheme in which EU accession countries can opt for a temporary exemption for joint implementation activities.[311]

2.3 Effects for the energy producing countries

Article 4.8 of the UNFCCC provides that parties must give full consideration to the specific needs of developing country parties, in their aim to reduce GHG emissions. This is especially the case for " […] countries whose economies are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products". OPEC member states have repeatedly referred to this article, to emphasize the negative effects they will face when the Protocol will be implemented fully.[312]

An OPEC study shows that if three OECD regions each impose a carbon tax that is sufficient to reach Kyoto targets, oil consumption would decrease by 6.5 mbd in 2010, compared with a Business-as-Usual scenario (BaU). This would entail a loss in annual OPEC oil export revenue of $23 billion. Obtaining Kyoto targets solely by imposing taxes implies the imposition of very high fuel taxes. Such high taxes are unlikely, due to a lack of popular support.[313] The OPEC scenario is based on a real OPEC basket price of $19.4. With low oil prices of $11.2, OPEC countries will lose $63 billion in revenue, compared to BaU.[314] Higher oil prices are likely to cause a considerably lower-than-BaU increase in world oil demand. Radetzki argues that if climate policy goals are established credibly in the near future, and demand decreases accordingly in a predictable fashion, fossil fuel producers will have ample time to adjust production capacity accordingly, thus preventing a significant impact on fossil fuel prices.[315]

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[309] There is no agreement concerning the specific meaning of these Articles among the different member states. See Wiser, *Op. cit.*, 2001, pp. 3-4.

[310] Ibid, p. 4.

[311] CEC, *Proposal for a directive of the European Parliament and of the Council amending the Directive establishing a scheme for greenhouse gas emissions allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms,* COM 403 final, 2003, p. 9.

[312] Van der Linden, N.H., Van der Linde, C., Lako, P., Van Rooijen, S.N.M., *Analysis of the Impact of the Kyoto Protocol on the export revenues of OPEC member states and on the oil import requirements of non-Annex I countries*, Dutch National Research Programme on Global Air Pollution and Climate Change, 2000, p.12.

[313] Ghanem, S., Lounnas, R., Brennand, G., "The Impact of Emission Trading on OPEC", *OPEC Review*, Vol. 23, no. 2, 1999, p. 79.

[314] Ibid, p. 104.

2.4 Effects in a privatised oil production market

"In a privatized international oil market, oil revenues must be collected in taxes. Most modern resource taxation takes the special cost structure and long lead-times into account. However, if as a result of the implementation of the Kyoto protocol, profit margins of oil companies decline, the tax receipts of oil producing countries will also decline. Although privatization shifts a substantial part of the entrepreneurial risk to private oil companies, the governments of oil-producing countries cannot avoid the risk that oil tax incomes will decline too."[316]

2.5 Different implementation scenarios

Holtsmark and Maestad provide different scenarios in which they discuss the effects of implementing Kyoto Protocol measures on fossil fuel markets.[317] They conclude that implementation will lead to small reductions in the producer prices of fossil fuels.[318] Some commentators note that measurement and verification processes are unfeasible, and legally binding agreements cannot be attained if implementation is unverifiable.[319]

Cooperation between Annex I countries and oil producing countries (among others, the OPEC member states) is advisable, to ensure a lasting implementation of the Protocol. If this were to be neglected, these countries will experience a loss in revenues that most of their economies, due to a lack of diversification, could not easily absorb. Five different formats of co-operation are presented in the paper by Van der Linden, Van der Linde, Lako and Van Rooijen.[320]

One of these possibilities, i.e. introduction of a carbon tax (CO_2 emission tax), could theoretically be implemented as a negative or zero *gross cost*. This would be the case if the revenues of this tax were used to alleviate other taxes that according to commentators distort economic decisions and thus reduce welfare, such as some of the existing taxes on labour and capital. Ideally, a carbon tax would enhance environmental quality, and improve economic welfare. This is called a double dividend. A prerequisite is for the tax to be introduced in a revenue-neutral fashion.[321] Simulations have shown that a double dividend is very difficult to attain, as it requires very high levels of technological change (advancements).[322]

According to some commentators, additional difficulty is posed by the declining role of the state in the global economy and that increasing presence of Transnational Corporations throughout the world pres-

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315 Radetzki, M., "What will happen to the producer prices for fossil fuels if Kyoto is implemented?", *Energy Policy*, Vol. 30, no. 5, pp. 357-369.

316 Van der Linden, Van der Linde, Lako, Van Rooijen, *Op. cit*., 2000, p. 54

317 Holtsmark, B., Maestad O., "Emission Trading under the Kyoto Protocol – effects on fossil fuel markets under alternative regimes", *Energy Policy*, Vol. 30, no. 3, 2002.

318 Ibid, p. 217. They emphasize the difficulty of implementation as a whole.

319 Banks, F.E., "The Kyoto Negotiations on Climate Change: an Economic Perspective", *Energy Sources,* Vol. 22, no. 6, 2000, p. 489.

320 Van der Linden, Van der Linde, Lako, Van Rooijen, *Op. cit*., 2000.

321 Boyd, R., Ibarrán, M.E., "Costs of compliance with the Kyoto Protocol: a developing country perspective", *Energy Economics*, Vol. 24, no. 1, 2002, p. 25.

322 Ibid, p. 37.

ents a serious challenge to environmental integrity and success of international environmental treaties such as the Kyoto Protocol.[323]

2.6 Some conclusions

Implementing the Kyoto Protocol measures is expected to slow down the growth in world demand of fossil fuels, especially in developed countries. This may lead to a greater availability of these fuels on the world market, making it easier for developing countries to satisfy their energy needs.[324] For developed countries, a possible means to reach their greenhouse gases reduction targets would be to enlarge the role of renewables in their energy mix. With renewables being produced domestically, this could also be an important step to enhance their energy supply security.

3 Euro or USD– Denominated energy bills

3.1 The International prevalence of the US Dollar

It is fair to say that the US dollar (USD) is by far the dominant currency in today's international financial markets. It has held this role since the end of the Second World War. At that time only the US had an open capital market with a stable currency, thus enabling other countries to build up dollar reserves and enabling free buying and selling of dollars on an international scale. The US also controlled most of the world gold reserves. The Bretton Woods System functioned as a vehicle for the dispersion of the dollar into the Western world.[325] Today, the dollar serves as a unit of account for a large part of all international trade, including oil trade. Exports of homogeneous primary products such as oil tend to be invoiced in dollars, with world-wide price formation in a centralized exchange.[326]

A second international function of the dollar, in addition to facilitating international trade, is serving as a means for foreign monetary authorities to better anchor their own domestic price levels by pegging their national currency, officially or unofficially, to the dollar[327] (i.e. the dollar as a nominal anchor). Non-central currencies in the international financial system can be called peripheral monies. These are the currencies that are exchanged in a central currency (often the USD) when trading with another country. When countries on the monetary periphery have domestic financial systems that are more fragile than that of the central money, there is an ever-lurking threat of currency crisis, i.e. a run from their peripheral money to the central one.[328] In the world at large, the dollar prices of internationally traded

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[323] See Schreuder, Y., Sherry, C., "Flexible mechanisms in the corporate greenhouse: implementation of the Kyoto Protocol and the globalisation of the electric power industry", *Energy & Environment*, Vol. 12, no. 5, 2001, entirely (pp. 487-498).

[324] Because of its physical aspects fossil fuels, especially oil, are ideal for countries that lack a developed energy infrastructure.

[325] For an explanation of the Bretton Woods System, see e.g. Burda, M., Wyplosz, C., *Macroeconomics, a European Text*, Oxford: Oxford University Press, 2001, pp. 521-524.

[326] McKinnon, R., "The World Dollar Standard and the East Asian Exchange Rate Dilemma – Part One", *Perspectives*, Vol. 3, no. 4, 2002.

[327] Ibid.

commodities are relatively invariant to fluctuations in the dollar's value against other currencies. So, as the Nth country in the system, the US alone can carry out an independent monetary policy to target its own domestic price level without being much disturbed by exchange rate fluctuations.[329] This also causes other countries to peg their currency to the dollar. This is called 'fear of floating'.[330] Only the Eurozone can be seen as a quasi-independent monetary regime next to the dollar.

IMF policies over the years have caused a certain degree of dollar encroachment on national monies in developing countries, by encouraging peripheral countries to jettison their capital controls too soon in the process of liberalisation.[331]

3.2 Four scenarios

A Euro country 'A' buys 5 barrels of oil from Russia 'R'. Basic assumptions: price of one barrel is 20 USD. 1Euro = 1$ = 2R, with a floating exchange rate system.

1. Scenario 1: Euro depreciates by 10%. In order to buy 5 barrels, 100$, of oil, A needs to give €111,11. R still receives 200R (worth of USD). A's costs have increased, and R, only accepting $, hasn't noticed.
2. Scenario 2: $ depreciates by 10%. A now only has to give €90, and R only receives 180R. A's costs decrease, as does R's revenue. (Producer state's currency risk)
3. Scenario 3: R depreciates by 10%. A still has to pay €100, R receives 220 R worth of USD.
4. Scenario 4: $ appreciates by 10%. A now has to pay €111,11 in order to get $100. These $100 now is worth 222,22R (Consumer state's currency risk).

3.3 Advantages of a Euro-denominated oil bill

What would happen if oil import prices were not any longer denominated in USD, but in Euro? The apparent reason for such a switch would be to eliminate the existing currency risk for the European oil-importing states because it is their currency, and for the energy exporting states only insofar as they need euros for their own imports of European products. First, we must assess whether such a currency switch is feasible or desirable. Secondly, we must try to determine the foreseeable effects of such a change in denomination both for the EU-15, and for the exporting countries.

3.4 Producer countries

On a world-wide scale, oil prices are set in USD. The oil market is fully integrated at a global scale, and because all prices are set in USD, the market is very transparent. Because of their oil exports, a host of Middle Eastern countries peg their currencies to the USD to a certain degree, more than they do with respect to the Euro. Such a system seems to reinforce itself, as the choice for export price denomination in USD makes a national currency peg to the dollar highly desirable. An important role for the Euro in

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328 Ibid.

329 Ibid.

330 McKinnon, R., "The International Dollar Standard and Sustainability of the Current U.S. Current Account Deficit", *Brookings Panel on Economic Activity*, April 2001, p. 3.

331 McKinnon, *op. cit.*, 2002

the oil trade between the Middle East and the EU-15[332] is only feasible if existing trade patterns between these two regions are large enough. To determine this, the total money transfers between the different producer and consumer countries are relevant, including energy trade, but also trade in general and outstanding debts. For an overview of trade balances and energy trade data between the EU and the dominant oil producing countries, see below.

The same elements are important in the energy trade between the EU and Russia. In order to eliminate the existing currency risks in the energy trade between Europe and Russia, it is desirable from a European perspective to pay the Russian oil (and gas) import bill in Euro. The Russian rouble is not considered a hard currency. The Euro will only be acceptable if its use for Russians is comparable to that of current role of the USD. This means that the euro will have to fulfil several prerequisites.[333]

3.5 The international role of currencies

For a national currency to be used at an international level as an accepted denomination for international trade, this currency has to meet the following requirements:

- **An accepted international medium of exchange**. It would be unwise for Russia or any other producer country to acquire large amounts of a currency which they could not put to use in other markets, especially if the amount of euros were larger than (a significant share of) the total sum of Russian (e.g.) imports of EU-15 goods. To be more precise, at least the amount of producer country's imports from the Euro-zone which will cover that currency risk must be assessed.
- The euro must be **a credible store of value**. If internationally traded commodities continue to be priced overwhelmingly in USD, the denomination of the oil bill in Euro actually constitutes a transfer from the currency risk from energy products to other commodities. It then depends on the size and direction of the producer country's (other) trade flows, whether this comprises a risk or not. The risk would decrease (or be shifted away) when the Euro is in use as a reserve currency in the other country. The acceptance of a currency as a credible store of value will be reflected in a third country's central bank acquiring large amounts of this currency.
- **The Euro must be an accepted unit of account**, so it can facilitate invoices, or currency pegs. Also it helps to measure and compare market values. This will contribute to the stability of the Euro in comparison with other currencies. It seems that this prerequisite does not pose an insurmountable problem for Europe at the moment.
- **Rise in international utilisation of the Euro,** as a standard of deferred payment, would facilitate recycling of oil-euros. In 2001 the euro share in total identified official holdings of foreign exchange reserves was 13 percent, compared to 68 percent for the USD, while for the global debt security market the percentages are 24.1 and 45.6 respectively.[334]

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[332] We do not to treat the UK £ separately.

[333] McKinnon, *Op. cit.*, 2002.

[334] European Central Bank, *Review of the International Role of the Euro*, 2002, p. 53.

3.6 Confirmation of the Euro as an accepted medium of exchange

The EU-15 balance of payments deficit in 2000 amounted to €89.5 billion. In contrast, the EU-15's aggregated oil import bill amounted to €118.5 billion for the same year. Mainly due to a rise in the value of the Euro as compared to the USD in the following years, the EU-15 aggregated oil import bill was €107.5 billion in 2001, and €102 billion in 2002.

It has been said that the reason for keeping oil prices in USD can be found in the fact that, despite being a large oil producer, the US is a large oil importer. This may be the case, but the EU is an even larger importer of energy products, while East Asia is the biggest oil-importing region.[335] These countries mostly have their currencies pegged to the dollar. The EU member states obtain most of their oil and gas imports from the former Soviet Union (oil and gas) and from OPEC countries (oil from the Middle East and gas mainly from Algeria). Also Norway is an important non-EU energy supplier.

Russia exported 3.7 mbd of oil to Europe in 2001, and in total 126 bcm of gas. Of this, 82.75 bcm was exported to the twelve Euro-countries.[336] Consequently, the EU-15's energy trade balance with Russia, in 2000,[337] showed a deficit of €22.5 billion. The total trade balance deficit of the EU-15 with Russia was €25.5 billion.[338] EU-15 oil imports from OPEC totalled 4.36 mbd in 2001, or 217.1 million tonnes for the whole year.[339] Gas imports from OPEC countries, overwhelmingly from Algeria, made up 29.1 percent of total EU-15 gas imports in 2000, with 55.5 bcm.[340] The EU has a trade deficit with OPEC since early 1999. In 2000 this stood at €32.3 billion, with exports to OPEC countries reaching €53.8 billion, and imports amounting to €86.1 billion. 65 percent of this is in energy products (i.e. nearly €56 billion).

In comparison, energy trade between Russia and the United States was limited mainly to oil, and stood at the fairly small number of 90,000 bbl/d in 2001.[341] Total US imports from Russia were valued at $6.3 billion, and exports were $2.6 billion, leaving the US with a trade deficit of $3.7 billion.[342] The US imported 3.56 bcm of LNG from OPEC member countries, and 5.4 mbd of oil from OPEC countries. In comparison, non-OPEC oil imports, mainly from Canada and Mexico, amounted to 6.17 mbd.[343] In 2002 total US imports from OPEC countries amounted to $53.3 billion, and exports stood at $18.9 billion, giving a trade deficit of $34.5 billion.[344]

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335 Source: BP. In 2001, the US imported 11.4 mbd, Europe 11.9 mbd and the East Asian countries over 13 mbd.

336 Source: BP. In 2000, this was 78,48 bcm. Source: Eurostat. This gave Russia a share of 41% of all non-EU gas supplies.

337 In 2001 it was up to €26.5 billion.

338 Source: EUROSTAT. *Yearbook 2002*, pp. 376-377.

339 Source: EUROSTAT. *Statistics in Focus*, Theme 8, 8-2002.

340 Source: EUROSTAT. In 2001, according to BP, this figure had grown to 59,07 bcm.

341 Source: BP.

342 Source: http://www.bisnis.doc.gov/bisnis/country/2001usrstd.htm.

343 Source: US Energy Information Agency (EIA), http://www.eia.doe.gov/emeu/aer/txt/ptb0504.html.

344 Figures do not match perfectly because of rounding off. Source: http://www.census.gov/foreign-trade/balance/c0001.html.

3.7 Euro as a credible store of value

During the past decade the dollar has functioned as a good (trustworthy) store of value, better than the East Asian currencies, better than the rouble, and better than the Euro in the first years of its existence. Now, in the first part of 2003, the Euro is performing better than the dollar. This does not necessarily have to be a structural phenomenon. It could be a reflection of the international financial market's uncertainty over the huge government deficit and trade deficit of the US. With a current account deficit of $600 billion, the US needs to attract $2.7 billion of overseas funds every working day. Also, apparent signs that the US government is leaving its strong dollar policy in favour of a laissez-faire interpretation[345] could explain the current rise in value of the Euro as compared with the $. At this moment, the Eurozone has a more balanced external accounts position.[346]

3.8 Euro as an accepted unit of account

Crude oil is the world's most actively traded commodity. Energy is traded in different ways. The method preferred for natural gas trading is long-term contracts, while spot market trading is done with oil at the Nymex crude oil futures market. Long-term oil contracts also exist, while a global LNG spot market is expected to develop in the next five to ten years. In the Gulf, Dubai crude oil is used as a marker crude, because it is one of the few Gulf crudes available in single, on the spot, sales as opposed to long term supply contracts.[347] The volume of trade in the oil futures markets of NYMEX and IPE amounts to more than half of total oil trade. In addition, Brent is used to price 65 percent of the world's traded crude oil. Denomination of parts of the international oil trade in euros would prove that the euro is an accepted unit of account.

3.9 International utilisation of the Euro

International utilization of the euro increases when it is used as one of the currencies in which national debts are currently denominated. It could thus be used to trade off debt repayments and interest payments with energy exports, when both are done in the same currency. The total external debt of the Russian Federation in December 2002 was calculated at $ 153.5 billion, of which $ 104.7 billion by the Federal Government. $ 7.1 billion of this was debt out of Eurobonds, and several Euro-countries are important creditors, by means of the so-called 'Paris Club', a group in which creditors of the Former Soviet Union stand combined. Germany is entitled to $ 18.8 billion, Italy $ 6.66 billion, France $ 1.96 billion and the UK $ 392 million.[348]

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345 *Financial Times*, May 20, 2003, "Euro Back to Launch Level".

346 Yarjani, J., "The Choice of Currency for the Denomination of the Oil Bill", Speech, April 14, 2002, Oviedo, Spain, http://www.opec.org/newsinfo/speeches/sp2002/sparaquespainapr14.htm

347 http://www.ifs.ru/body/memo/2002/Aug/e050802t.htm.

348 Source: Central Bank of the Russian Federation,
http://www.cbr.ru/eng/statistics/credit_statistics/print.asp?file=debt_e.htm.

Figure 3.1 Overview of currencies pegged to the USD and/or the Euro[349]

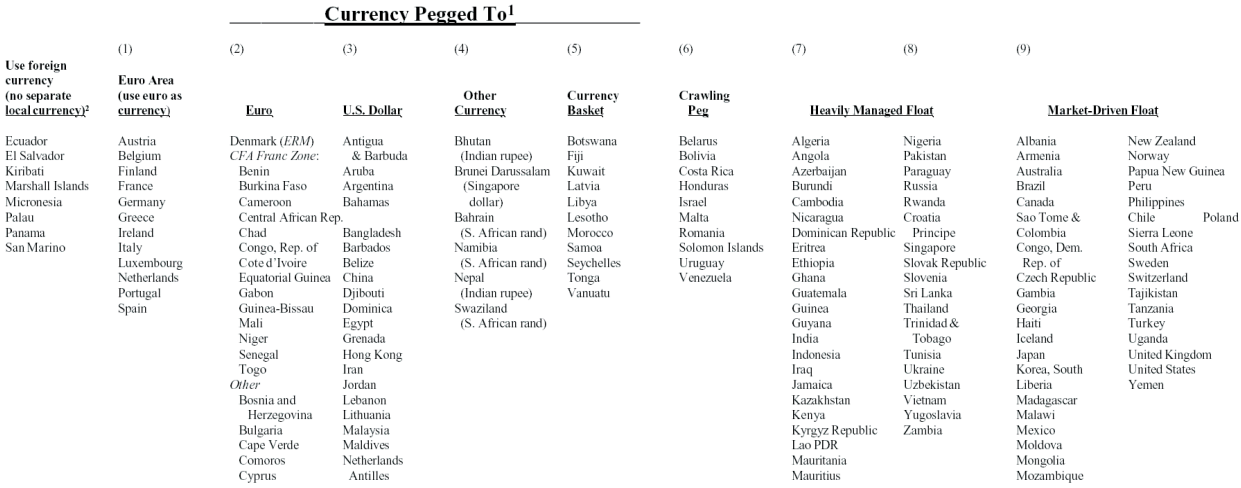

Table 3.1 Trade balances and energy trade data

Country	Total Imports	From EU	EU's share of country's total	Energy from EU	Total Exports	To EU	EU's share of country's total	Energy to EU	Country's Trade Balance	Trade balance with EU	Energy trade balance with EU	Year
Russia	41000	30300	73,90%	100	91900	47500	51,69%	26400	50900	17200	26300	2001
Kazakhstan	6978	1571	22,51%	7,3	13179	2991	22,70%	2064,1	6201	1420	2056,8	2001
Azerbaijan	1593	337	21,16%	3	2584	1106	42,80%	1064	991	769	1061	2001
CIS Total	76561	27725	36,21%	157	155281	54770	35,27%	26397	78720	27045	26240	2000
Iran	20276	6578	32,44%	9	28560	6675	23,37%	5579	8284	97	5570	2001
Iraq	3600	1931	53,64%	0	11810	3555	30,10%	3552	8210	1624	3552	2001
Kuwait	8700	2900	33,33%	10	19700	1800	9,14%	1600	11000	-1100	1590	2002
Saudi Arabia	46700	14700	31,48%	30	75900	12300	16,21%	9600	29200	-2400	9570	2002
Qatar	4500	1900	42,22%	2	14300	500	3,50%	200	9800	-1400	198	2002
UAE	47300	14100	29,81%	100	44000	2800	6,36%	800	-3300	-11300	700	2002
Algeria	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indonesia	41500	4500	10,84%	20	69800	10200	14,61%	500	28300	5700	480	2002
Libya	4434	2496	56,29%	309	13763	13031	94,68%	12579	9329	10535	12270	2000
Nigeria	8958	3843	42,90%	433	21634	6319	29,21%	5810	12676	2476	5377	2000
Venezuela	19418	3686	18,98%	38	26798	2939	10,97%	1880	7380	-747	1842	2001
OPEC Total	205386	56634	27,57%	951	326265	60119	18,43%	42100	120879	3485	41149	
Norway	35355	26154	73,98%	1079	64256	45113	70,21%	24118	28901	18959	23039	2001
All figures in million euro												
Source: http://europa.eu.int/comm/trade/bilateral/data.htm OPEC Total excludes Algeria: figures unknown												

Source: http://europa.eu.int/comm/trade/bilateral/data.htm OPEC Total excludes Algeria: figures unknown

[349] Source: International Financial Statistics, August 2002

3.10 Effects of trading in Euros

International acceptance of the euro as a preferred currency in international transactions will only happen if the euro meets the above-mentioned four preconditions. If this were the case, an extension of the role for this currency to include energy payments between Russia and the Eurozone would be reasonable if this new role is a logical consequence of existing trade patterns. For Russia's the current account balance, the total sum raised with energy exports to the EU is slightly smaller than the total amount of euros needed by Russia to import European goods. Russia's Central Bank now holds over 20 percent of its foreign exchange reserves in euros.[350] The bank has been increasing its foreign exchange reserves significantly in recent months, up to $61 billion in May 2003 from $44 billion in December 2002.[351] Also, Russia needs euros to fulfil its outstanding interest payments on its loans from EU countries.[352] Switching energy payments from dollars to euros would thus exclude a currency risk from the larger part of the payment flows between Russia and the EU.

A consequence international oil trade being denominated in US dollars is that the oil market is very integrated, with transparent prices world-wide. This provides clarity for both producers and consumers, even if it may entail a currency risk. Also, this transparency is useful for both producers and buyers because it enables arbitrage and hedging, whereby a given minimum and maximum price for oil is agreed upon for future deals. Hedging is common practice, also in the natural gas trade. When for example the gas trade between Russia and the EU switches from dollars to euros, hedging could become problematic. At the moment, gas prices are derived from world oil prices, which are set in dollars. Thus, it would only make sense to switch currencies in this trade relation if gas prices are set independently from world oil prices. This requires much larger spot trade in gas than presently available. Such a sufficiently large spot market for natural gas has not materialized yet, even though some commentators think that this will happen in the near future. Only then does a currency switch eliminate the currency risk that exists today, while allowing a continuation of the existing practice of hedging.

The international use of the euro is a reflection of the strength of the European economy, in comparison with the American economic situation and outlook. In recent years, and throughout most of the last decade, the American economy outperformed the Eurozone. Especially growth in domestic demand was much smaller in Europe than in the US.[353] Any growth of the European economy is for the larger part caused by an increase in exports. The international competitiveness of European exporters could be harmed by an increase in the value of the Euro as compared to the other major currencies, US dollar and Japanese yen, threatening to make Eurozone exports too expensive.

If a currency swap were to happen, the effect on international financial markets will be twofold. First of all, a switch to euros in energy payments would signify a decrease in the international demand for US dollars. With dollar supply unchanged, due to the American balance of payment deficit, and demand

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[350] *BusinessWeek Online*, "Super Euro", February 17, 2003. Http://www.businessweek.com

[351] http://www.cbr.ru/eng/statistics/credit_statistics/print.asp?file=inter_res_03_e.htm

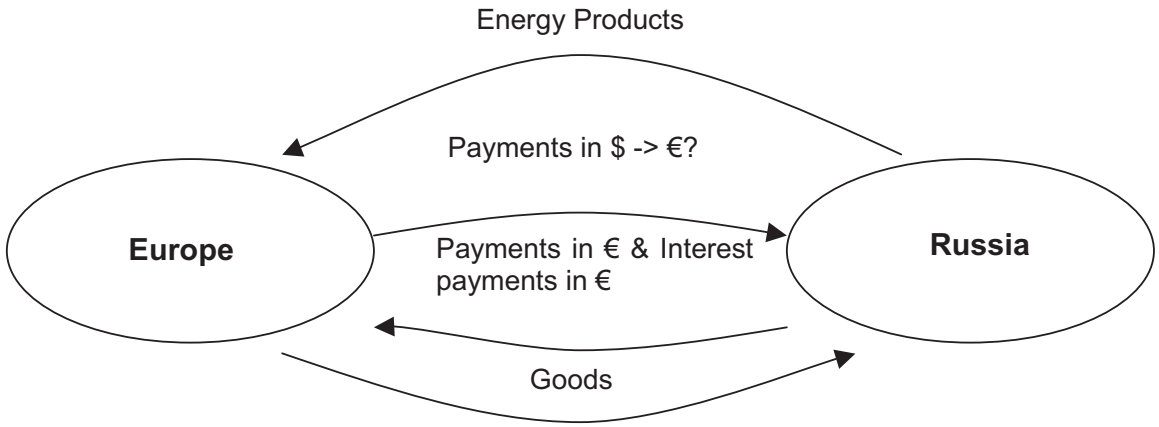
[352] There is no information on exact amounts.

[353] The US recorded a growth in domestic demand of 0.4% in 2001 and 3% in 2002, while that in the Eurozone stood at 1% in 2001 but only 0.3% in 2002. Source: *Financial Times*, June 25, 2003, p. 13.

falling, the value of the dollar would be under pressure, resulting in a decline of the value of the dollar. Besides being a stimulating factor in American exports, a lower-valued dollar would hamper the American financial situation, making it harder for the US government to deal with their current account deficit (see above). Secondly, a transformation of the European single currency from a local currency into an internationally traded store of value means that large volumes of it will be stored and traded outside the grasp of the European Central Bank, severely limiting the ability of the European Central Bank to pursue its own monetary policy and allowing for speculation. It is debatable however if international speculation trading of the euro is not already taking place, and enlarging the amount of transactions done in euros, with prices set in euros, would exclude energy trade with Russia from the effect of any speculation on Europe's trade account.

The speed with which a currency switch is executed also has its implications. A sudden switch from dollars to euros as denomination for the energy trade between Europe and its main suppliers will cause a decrease in demand for dollars on a world-wide scale, while supply will remain large, as the US government still has to find ways to finance its budget deficit and current account deficit. Therefore, with supply high and demand falling, the dollar will lose some of its value in comparison with the euro or the Japanese yen. This is not necessarily a good development for the EU member states, because it makes European exports expensive, causing a partial decline in European economic performance. By giving international financial markets more time to adapt to the new situation, a more gradual currency switch, if possible, could maybe offset this rise in value of the Euro. Most trade in Europe is directed inwardly, only 14 percent of European GDP is derived from international (i.e. non-European) trade. With such a small portion of GDP coming from international trade, currency risks are relatively small when looking at the entire economic performance of a country or region.

Figure 3.2 Trade between Russia and the EU



For Figure 3.2 it must be further specified that payments are made to Russian companies, not the Russian government, while Russian imports are mostly done by other, not related, Russian companies and the Russian government. Companies obtain their capital from the international financial markets, and have to pay interest and repay their loans, preferably without inducing another currency risk.

3.11 Conclusion

Pondering on a currency switch, if possible, would mean the choice between two risks. Either such a switch is not made, and European consumers and some producer states remain susceptible to currency risks. However if such a switch is made, and energy import deals are made in euros, there is risk concerning the relative value of the euro. The implications of a currency switch in Europe's energy trade could even reverberate in the American current account balance, and will have significant implications for the national banks of countries that would start to trade energy products in euros, as their national banks will have to build up considerable reserves of this currency.

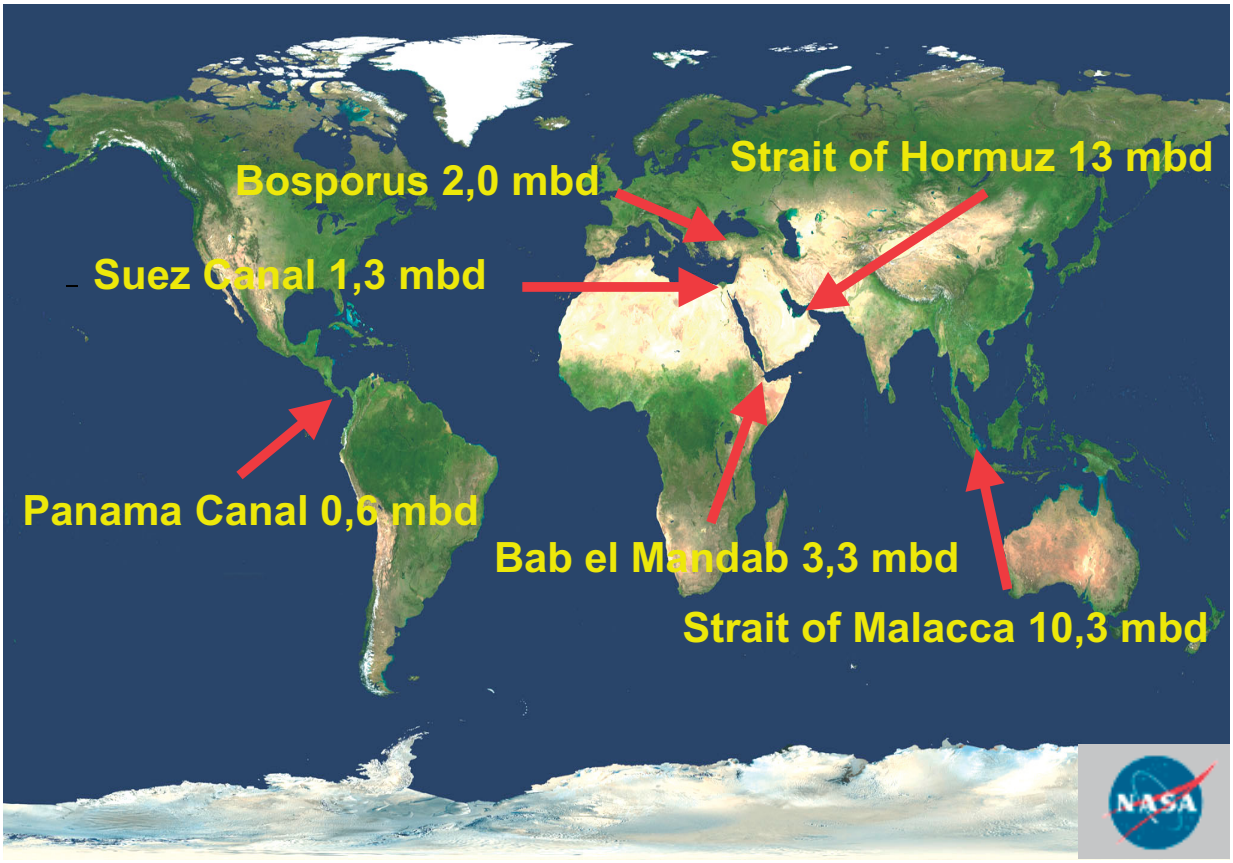
The US current account deficit has only be sustained thus far because of huge amounts of foreign investments entering the US and because other governments are acquiring large reserves of US dollars. Last year US trading partner countries added $220 billion to their reserves.[354] US demand can only be sustained because of this international demand for the US dollar. If, however, demand for the dollar falls, and consequently the dollar depreciates in comparison to the euro, this will have grave consequences for the economies of the Eurozone. Such a decline in demand for dollars can be discerned already, as can be seen in the recent appreciation of the euro, and could be exacerbated by a currency switch in the energy trade between Europe and the energy producing countries. As a commentator stated in the *Financial Times* (July 2nd 2003), "It follows that [..] (if) there is an adjustment of the US current account it will be suffered largely by the Eurozone, which will be forced into continuing stagnation, or worse."[355]

[354] *Financial Times*, "The World economy adjusts to a disappointing decade", July 2, 2003, p. 13.

[355] Ibid. Article by Martin Wolf.

4 Choke points risk assessment

A chokepoint is a strategic strait or canal, which could be closed or blocked to stop sea traffic. Of all oil traded internationally each day, more than three-fifths moves by sea, the rest by pipeline. This section provides a brief overview of the most important choke points in contemporary oil trade patterns.



- **Bosporus** (Turkey). Oil flows (2001) 2.0 mbd, from the Black Sea towards the Mediterranean. Only a half mile wide at one point, very busy and hard-to-navigate waterway. At the moment the only maritime export route for crude oil made available at Black Sea ports, i.e. the majority of all current Caspian oil production. More stringent Turkish rules on tanker transits have reportedly added a few days to the transit time. A very congested sea-lane, accidents occur quite often. A major accident could cause significant environmental damage and shipping could be suspended for a prolonged period of time.
- **Strait of Hormuz** (Oman/Iran). Connects the Persian Gulf with the Gulf of Oman. Oil flows (2002) 13 mbd, towards Japan, the US, Europe. Several miles wide, of major importance for Middle Eastern oil exports. If by any reason the Strait were to be closed for shipping, it would be very difficult to make up for lost transportation volume. During the Iraq-Iran war of the 1980s shipping through the strait continued uninterrupted, despite Iranian threats to close the

Strait, because both countries depended on this route for their oil exports. Significantly less accident-prone than the Bosporus.

- **Strait of Malacca** (Malaysia/Singapore/Indonesia). Oil flows (2002) 10.3 mbd, to Japan, South Korea, and China. Narrowest point, Phillips Channel in the Singapore Strait, is only 1.5 miles wide. If the Strait of Malacca were to be closed, nearly half of the world's fleet would be required to sail further. All excess capacity of the world fleet might be absorbed, immediately raising world freight rates. A threat to normal operations of this sea-lane would be a successful separatist movement in Aceh, Indonesia. Can be circumvented in case of closure, but this would require significant time and adds to transportation costs.
- **Bab el Mandab** (Djibouti, Eritrea, Yemen). Oil flows (2000): 3.2–3.3 mbd. When blocked, could be circumvented for traffic in the direction of the Suez Canal/Sumed Pipeline by using Saudi Arabia's East-West pipeline (capacity 5 mbd). A very large French tanker (the Limbourg) was attacked by suicide terrorists in November 2002 of the coast off Yemen.
- **Suez Canal** (Egypt). From Red Sea to Mediterranean Sea. Oil flows (2001) 1.3 mbd, the adjacent Sumed Pipeline transports an additional 2.5 mbd, all mainly towards Europe. Geographical proximity to Middle Eastern trouble spots (i.e. Israel / Palestine) could threaten normal operations of this route, as happened during the 1956 Suez crisis and the 1967 war.
- **Panama Canal** (Panama). Oil flows 0.6 mbd. 50 mile-long canal, 64 percent of which goes south towards the Pacific. If closed, the Trans-Panama pipeline could be re-opened to take over. Not very important, and in the current absence of local conflicts not a prime target.

The Russian Oil and Gas pipeline grid (Rossiyskaya Federatsiya). Large amounts of Russian and Kazakh oil are transported over land to export terminals at the Black Sea or Baltic region, or overland. Major pipelines are: Druzhba (overland) 1.2 mbd; Baltic Pipeline System 0.24 mbd; CPC 0.565 mbd (to the Black Sea). All Russian ports or pipelines are operating at or near capacity. Many of the country's pipelines are in state of disrepair, with 5 percent of production lost through illegal tapping. The current embargo of the Latvian port of Ventspils removes 733,000 bbl/d of additional export volume. Transneft's total export capacity lies at 3.5 mbd, Russian TNOCs have managed to add another 600,000 bbl/d by means of trains and shipping.

Annex 4

Main Trends in International and European Oil and Gas Markets

Main Trends in International and European Oil and Gas Markets

1.1 Introduction

Predicting oil and gas supply and demand is difficult, but the information generated in the world growth and energy models is necessary to identify the main trends in supply and demand. The information is used for investments decisions all along the oil and gas value chain and to determine long term policy-making. Yet, we must also acknowledge that there are numerous events or circumstances that push the market fundamentals of the predicted growth path. If such a deviation of the predicted growth path is temporary, the main trends remain intact and might merely cause a minor shift in the time frame in which a certain level of supply and demand is reached. Sometimes the change is more fundamental, such as the oil price increases of 1973/74 and 1978/79. The latter price increase, for instance, followed the Iranian revolution in 1979. In case of a more fundamental change, the level at which demand and supply will meet in the future is adjusted. In the past, projections of the level of oil and gas demand and supply have been rather optimistic. That is why models are complemented with various scenarios in order to capture the unanticipated changes in the market in the trends. This study on the geopolitical developments and security of supply attempts to complement the results of other studies.

The context in which oil and gas market developments take place now and in the future is important. Potentially the regime change in Iraq could have a major impact on future market developments.[356] The present uncertainty about the outcome of the US-UK intervention in Iraq, the level of international cooperation to stabilise Iraq and the effect on the other Persian Gulf countries are certain to affect the predicted market developments. Yet, we cannot determine exactly which outcome. In this chapter we present the trends in accordance with the *IEA Reference scenario* published in the World Energy Outlook 2002, and we will qualify our conclusions about possible future developments in this and later chapters.

2 Oil

Oil was a major driver in the substantial growth of international trade in the past few decades. Oil was the preferred fuel because it was amply available, easy to transport, and widely applied in the new industrial process technologies and products. Subsequently, light industrial sectors and process technology were able to increase the efficiency of production processes, and ended the requirement for corporations to position themselves on locations near fuel supply centres, transport corridors, or coastal industrial sites, which is still more or less the case with gas and coal industries. This new economic flexibility that resulted from the use of oil as the predominant energy source, in combination with the improved communication methods and the international capital flows enabled the internationalization of production. The new flexibility enabled companies to reduce the costs of production with the relocation of their production to those sites where labour, energy, capital or knowledge costs were the lowest.[357] Oil was at the heart of the post-1945 economic expansion in the world.

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[356] Van der Linde, C., "The Geopolitics of Oil: Is Iraq a Gamechanger?", in: *Cannons and Canons, Clingendael Views of Global and Regional Politics*, A. van Staden, J, Rood, H. Labohm (eds.), Assen: Van Gorcum, 2003, pp. 359-363.

[357] Dicken, *Op. cit*., 1992, part II, pp. 91-227.

2.1 Oil reserves

The world is not predicted to run out of oil in the next few decades, and if we factor in the huge reserves of unconventional oil, the world can enjoy consuming oil for much longer[358]. The problem in the next few decades is therefore not resources but resource mobilisation. In the last few years proven oil reserves have remained fairly stable. Proven reserves are defined as oil deposits that are considered 90% probable at current prices and technology.[359] Current estimates put proven oil reserves at more than 1000 billion barrels.

Table 2.1 World crude oil reserves (Billion Barrels)

Continent/Region	Oil & Gas Journal Jan 1, 2003	World Oil Year-end 2001	BP Year-end 2002
North America	215.089	49.979	49.900
Central & South America	98.551	69.081	98.600
Western Europe	18.267	17.749	15.600
Eastern Europe and Former SU	79.190	67.126	80.500
Middle East	685.642	662.483	685.000
Africa 77.429		94.855	77.400
Asia & Oceania	38.712	56.491	38.700
World Total	1,212.881	1,017.763	1,047.700

Source: BP, *Statistical Review of World Energy*, June 2003, data for end of 2002, http://www.bp.com; Oil and Gas Journal and World Oil as quoted on US Energy Information Administration website: http://www.eia.doe.gov, data for end-2001 (World Oil) and January 1st, 2003 (Oil and Gas Journal).

The international market for oil and gas has undergone rapid changes in the past three decades. Technological progress in exploration and production of oil and gas, for instance, has brought unconventional oil within reach, but has also contributed to increased recovery rates in existing oil fields. As a matter of fact, oil reserves at the beginning of 2003 grew, according to the Oil and Gas Journal, with nearly 200 billion barrels. That is an increase of substantially more than Iraq's current reserves of 112 billion barrels, the country that previously held the second largest reserve-base. The bulk of this increase in world oil reserves was due to the growth, compared to year-end 2001, of the Canadian reserves with almost 175 billion barrels when it included its oil sands to proven reserves. In terms of the feared concentration of oil reserves in but a few exporting countries, particularly in the Persian Gulf region, the new proven reserves data have changed the outlook, at least for the North American market, drastically.

The inclusion of the Canadian oil sands in proven reserves substantially improved the North American reserve position (See table 2.1). This positive development for the North American continent, and the US

[358] Odell, P., presentation 21 May 2003, Wassenaar, the Netherlands, http://www.oranje-nassau.com.

[359] Another definition that is used in oil (or natural gas) exploration activities is that of possible reserves. Possible reserves are defined as deposits that are considered 50% probable. Until recently, unconventional oils were placed in this category.

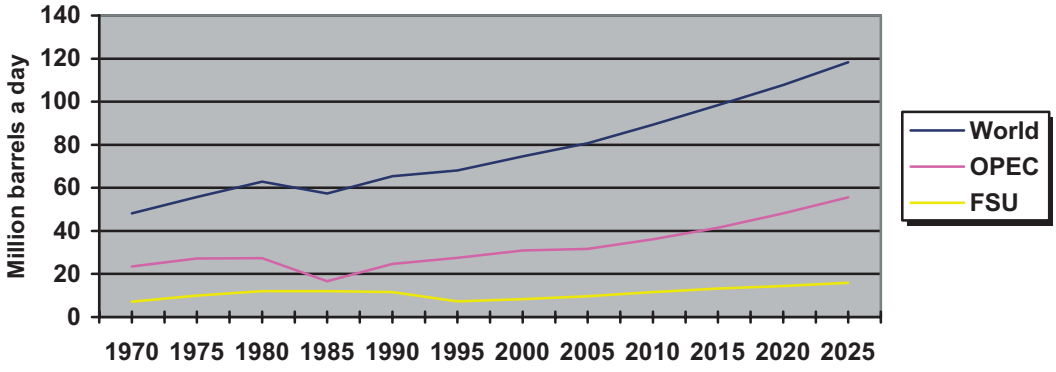
as the main importer, was further bolstered by the addition to reserves of another 17.5 billion barrels by Venezuela, an important supplier of the US market. This is a stark contrast with the reduction of proven oil reserves in Africa with about 18 billion barrels and the reduction in Asian reserves with about 17 billion barrels. Based on regional trading patterns in oil, the vulnerability of the US has reduced substantially with the rise of the reserves of its politically stable neighbour, while the vulnerability, based on domestic/ regional reserves, increased elsewhere.

The new reserve data did not, however, change the outlook of the EU and Asia much, except that competition for oil and gas resources from the United States might become less pressing in the future than anticipated a few years earlier. Particularly because the IEA estimates that the US still has substantial undiscovered resources.[360] The EU and Asia will continue to heavily rely on oil imports from the Middle East, Russia and the Caspian Sea region, regions that also are estimated to have large undiscovered resources.[361]

2.2 Oil production

In July 2003, world oil production was 78.3 million barrels a day, an increase of 8.6 million barrels since 1992[362]. The IEA World Energy Outlook 2002 predicts oil supply to grow to 88.8 million barrels per day in 2010, 104 mb/d in 2020 and 120 mb/d in 2030 (see figure 6.1).[363] The share of OPEC in world oil production is predicted to increase from 38.4% in 2000 to 54.1% in 2030. The share of the Middle East OPEC member states, which was 28.1% in 2000, is predicted to increase to 29.8% in 2010, 36.4% in 2020 and 42.9% in 2030. The Persian Gulf countries are predicted to produce 51.4 mb/d of oil, while the remainder of the OPEC countries are predicted to produce 13.5 mb/d in 2030. The Persian Gulf region will become an even more important supplier of the world oil market than it is today. It is clear that the future supply gap will be filled predominantly by production from the Persian Gulf countries.

Figure 2.1 World oil production: Recent history and future projections[364]



Source: Data from 1970 until 2000: BP, *StatisticalReview of World Energy*, June 2003. Projections from EIA's *International Energy Outlook 2003*, p. 238.

360 IEA, *Op. cit*. 2002, table 3.5, pp. 97.

361 Ibid.

362 Petroleum Intelligence Weekly, Vol. 42, no. 33, August 18, 2003, p. 3.

363 IEA, *Op. cit*. 2002, table 3.4, pp. 96.

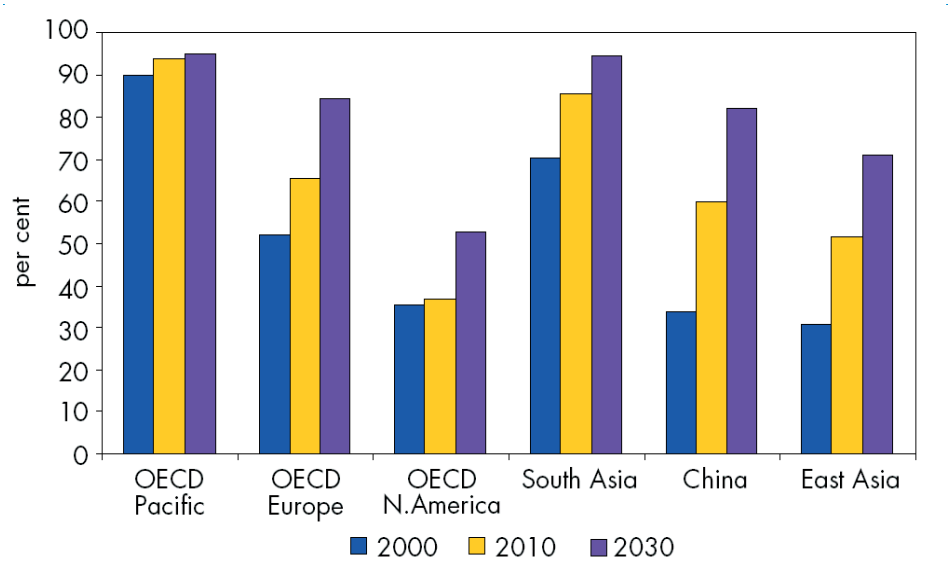
2.3 Oil consumption

Oil consumption will most probably continue to rise in the next few decades. Oil demand projections to 2020 vary among studies between 1.1% average annual growth in the Shell scenarios of 2001 and 2.2% in the US DOE 2002 and DRI/WEFA 2001 studies. The IEA estimates demand to grow to 2020 at an annual average growth rate of 1.7%, similar to the OPEC 2001 estimates.[365] In OECD countries oil demand is expected to increase at a low average annual growth rate of 0.8%. In the industrialized countries the oil market is mature, and in some cases oil is gradually replaced by other fuels, such as natural gas in electricity production.

The share of the OECD countries in world oil demand will decrease from 62% in 2000 to only 50% in 2030.[366] This reduction in the share of world consumption is due to the fast increasing share of consumption of developing and transition countries. However, oil demand is projected to grow considerably in China and India because of their economic development accompanied by an expected rise in car ownership figures. This is based on the expectation that there will be no economically viable alternatives for oil as a transportation fuel in these markets.[367]

The import dependence will grow substantially in all major consumer markets, except in Asia Pacific where the import dependency is already very high (See figure 2.2). The import dependency of Europe, China, South Asia and East Asia will grow to more than 70% of domestic consumption in 2030. The import dependence on the North American continent is predicted to grow but, due to the substantial exports from Mexico and Canada in the US market, will be substantially lower than in the other major consumer countries/ regions.

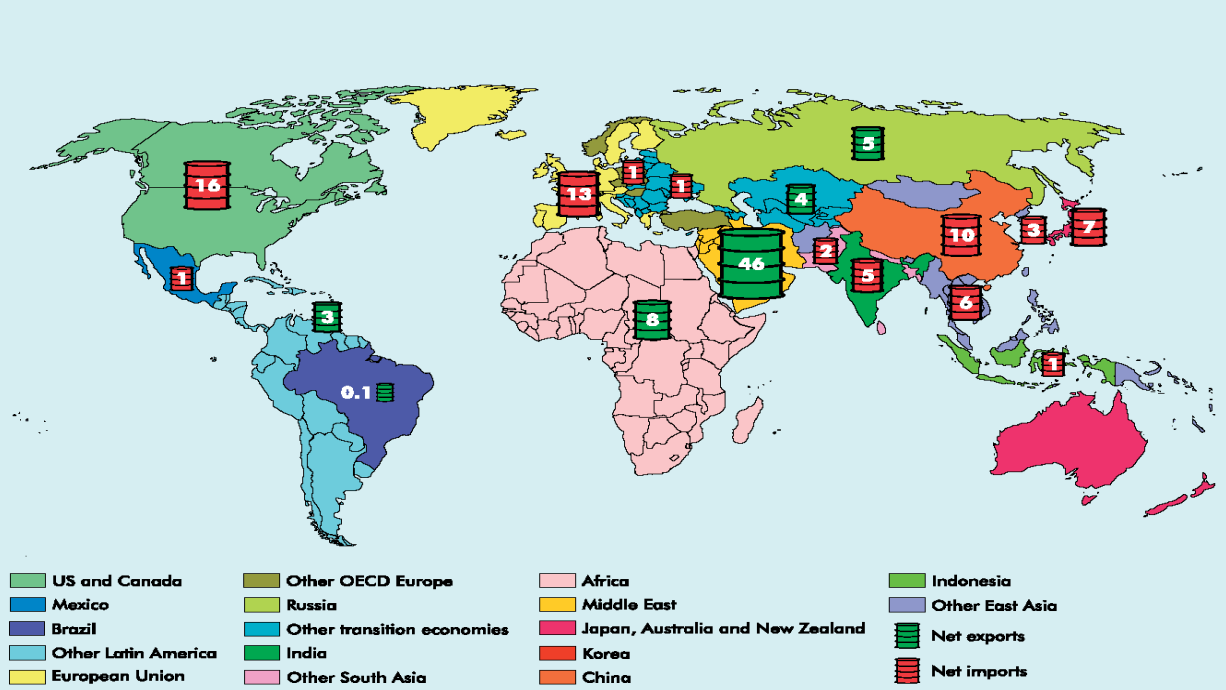
Figure 2.2 Oil import dependence by region



Source: IEA, *World Energy Outlook 2002*, p. 108.

Nevertheless, the predicted import dependence of 50% of consumption of North America still translates into large volumes of imported oil (16 mb/d in 2030). These imports will have to originate in the large exporting countries in the Middle East. The ability to diversify the oil imports to geographic origin will become increasingly limited for consumer countries because supplies will come from a concentrated group of exporting countries (see figure 6.3). As a result, the dependence of China and the EU on imports from the Middle East will grow substantially in the coming decades.

Figure 2.3 Net inter-regional oil trade 2030 in mb/d



Source: IEA, *World Energy Outlook 2002*, p. 107

2.4 Market structure and investments 1973-2003

The investments of international oil companies in the North Sea, Alaska and recently in the Caspian Sea basin and many other Non-OPEC countries reduced the share of OPEC in world oil production. OPEC produces a smaller share of world production today than in 1973, about 41% and 53% respectively.[368] World production increased with 15 million barrels a day since 1973 and this increase can be attributed nearly completely to non-OPEC oil producers. The OPEC countries have been unable to match their

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[364] FSU stands for Former Soviet Union: figures are for the combined production of Russia and all the (other) newly independent republics. Note that the projected production levels are based on the US government Energy Information Administration (EIA). These projections are sensitive to future oil price predictions.

[365] IEA, *Op. cit*. 2002, Table 3.2, pp. 93.

[366] IEA, *Op. cit*. 2002, p. 91.

[367] IEA, *Op. cit*. 2002, pp. 27, 29, 30.

[368] BP *Statistical Review of World Energy* 1974 and 2003.

share in world proven oil reserves (78%) to their share in production. Most of OPEC's reserves are located in the countries around the Persian Gulf.[369]

Investment flows in the oil industry have, as a result of the self proclaimed 'investment isolation', hardly been able to reach the OPEC countries. The countries opted for domestic development of their oil resources. In most countries this meant that existing capacity was maintained but hardly any expansion of capacity was realised. The production policy to stabilise prices at a relatively high level reduced OPEC output from 30 mb/d in 1973 to 17-18 mb/d in the period 1982-1989.[370] Only in the 1990s did OPEC production increase again to levels comparable to those of 1973.[371] OPEC policy created a situation in which state oil companies have been unable to develop any knowledge on exploration, particularly not off-shore where international oil companies made many technological breakthroughs and were thus able to reduce costs.[372] After the price collapse in 1986, financial difficulties aggravated the investment situation. In order to secure investment capital, some countries began slowly to open up for FDI. With the exception of the Iranian off-shore, the countries around the Persian Gulf did not participate in the 1990s round of liberalisation of the oil industry. Only recently, some openings have been created. As a result, investment flows in the oil and gas sectors by-passed their economies and benefited the sector in other countries that would have otherwise have had a harder time to develop. In a way, the Persian Gulf countries created their own loss of their competitive edge and helped other countries to gain entry in the market.

The structure of the industry that the oil producers had created after 1973 became a serious stumbling block to development. Governments see their state oil companies as a tool to satisfy a wide range of interests, many times robbing their oil industries of the capability to invest and compete. In some countries, like Venezuela, differences of opinion between the management of the state oil company, PDVSA, and the only shareholder, the state, about the development of the oil industry and the investment policies had been growing since the late 1980s and led to a deep political crisis in 2002. Also in other OPEC countries various types of problems arose in the management of the oil sector that questions the wisdom of the state-led oil sector. Particularly the cost of stabilising the market has become a heavy burden on the OPEC countries. Adelman states: "By 1970, the oil companies were in the saddle only as well-paid

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[369] The countries around the Persian Gulf and Oman represent 64.8% of world proven oil reserves. BP *Statistical Review of World Energy* 2003.

[370] The Saudi share in the production cuts of OPEC was substantial. In 1980 the country produced 9,9 mbl/d, while in 1985 production had declined to 3,1 mb/d. OPEC Annual Statistical Bulletin, 1991, p. 51; BP *Statistical Review of World Energy* 1980, 1990, 2000.

[371] In 2001, the OPEC production level reached about 30 million barrels per day, only to decline afterwards as a result of production cutbacks. BP *Statistical Review of World Energy* 2002.

[372] Adelman says about technology: 'The idea that oil prices must rise in the longer term is based on diminishing returns. The largest oil resources will be found first. The marginal cost will increase in time and so does the price. However, it is clear now that the diminishing returns are countered by increasing knowledge about the geology of the earth and the way in which minerals can be produced. The price of oil (and other minerals) is the uncertain result of increasing marginal costs of smaller and geological harder to produce sources and the advance of technological knowledge.' Adelman, *op. cit*., 1993, p. 186.

jockeys; the oil exporter nations owned the horses and collected the winnings. They could have continued to set excise taxes as a price floor and left the companies in place to invest and produce efficiently and to compete on the narrow margins left to them. But the OPEC nations were prisoners of current opinion and of their own past, resentful at having been exploited and despised as poor and backward. To expel the companies was a moment of bliss. But they soon began to pay for it, and the bill keeps growing."[373]

The pressure to reform the domestic economy in the countries around the Persian Gulf increased in this period, but the political elites are unable to properly set this process in motion. Government expenditures became strained when oil incomes declined and the necessity to spend increased. The investment needs of the oil industry had to compete with expenditures in other sectors of the economy and social investments.[374] Since 1986, debts, fiscal deficits and balance of payments disequilibria became the OPEC countries' part.[375] The price collapse of 1997-1998 further aggravated the economic plight. For instance in Saudi Arabia, the ten year long attempts to bring the fiscal deficit within acceptable proportions was reversed within a year[376] and the Saudi currency, the Riyal, came under pressure.[377] The governments cannot really afford the risk of being a producer rather than a tax collector.[378] The pressure on OPEC countries to liberalise was mounting. Access to international capital markets and adapting to WTO standards are an important external pressure to comply.

Despite theses pressures, the governments were slow to introduce the necessary reforms.[379] The recent UNDP report[380] on the Arab world was a sad confirmation that the economies are badly underperforming and that in many ways the Arab countries are lagging seriously behind. The countries around the

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[373] Adelman, *Op. cit,* 1995, p. 5.

[374] Governments of OPEC countries invest only a small portion of their oil income in oil production. Between 1976 and 1987, governments in the Middle East and Africa invested less than 2% of oil incomes and investments in oil had to compete with subsidies, consumption and defence expenditures. Adelman, *Op. cit*., 1995, p. 9.

[375] Saudi Arabia, like Indonesia, suffered deficits on the current account in the period 1982-1995. The OPEC countries combined suffered current account deficits in the periods 1982-1984, 1986-1988 en 1991-1995. OPEC Annual Statistical Bulletin 1997; Due to the price fall in 1997/1998, many OPEC countries encountered balance of payments problems again. Iran, Nigeria and Venezuela also suffered current account deficits, The World Bank, *World Development Report 2000/2001*, Oxford: Oxford University Press, 2001, pp. 302-303. Venezuela and Indonesia reported government deficits in 1998. The other countries did not report any information on that year. *Ibid.*, pp. 300-301; In The Economist of March 6th 1999 (p. 22) large economic problems are reported in Saudi Arabia: "Low oil prices crippled the Saudi economy in 1998: output shrank by nearly 2%, both the current-account and the budget deficits soared to nearly 10% of GDP and debt approached 100% of GDP."

[376] Saudi Arabian Monetary Agency, *Thirty-Fourth AnnualReport*, 1419H, 1998, pp. 21, 125, 306-307.

[377] Zonis, M., "The New 'Oil Shock', Political Instability is Next", *Petroleum Intelligence Weekly*, February 1, 1999, p. 7.

[378] World Bank, *The State in a Changing World*, World Development Report 1997, Oxford: Oxford University Press, 1997, p. 63; Wälde, T., "Investment Policies in the International Petroleum Industry – responses to the current crisis", in: Beredjick, N., Wälde, T., *Petroleum Investment Policies in Developing Countries*, London: Graham & Trotman, 1988, pp. 7-27.

[379] Van der Linde, *Op. cit*., 2000, pp. 42-47, 116-126.

[380] UNDP *Op. cit*. 2002.

Persian Gulf are currently facing large demographic, social, political and economic problems that undermine the stability of the countries. The risk of a major upset in one or more of the countries in the region presents a real threat. It is from this internal pressure on the economy of OPEC countries and the inability to constructively deal with these problems that OPEC's policies in recent years should be seen. In that sense OPEC is beginning to lose its importance to producer countries because the countries can no longer absorb nor share the costs of stabilising the international oil market. Moreover, there exists a real danger that certain problems in the Persian Gulf countries spill over into the countries around the Caspian basin and vice versa. There are many similarities in the underlying factors of political instability, like militant Islamic groups, and governments have similar legitimacy problems. For consumer countries it would be a nightmare scenario if both regions prove to be equally unstable because they had hoped to hedge their import dependence on the Persian Gulf supplies in the Caspian Sea region. Indeed, the internal risks in Caspian Sea region are also a threat to the security of supply for consumer countries (see Annex 1).

2.4.1 The struggle for new acreage

With the maturity of the oil fields in Alaska and the North Sea, international oil companies, cheered on by their governments, needed substantial new investments to maintain their share of oil production. The opening up of OPEC countries to FDI, particularly in the Persian Gulf, was very slow indeed. Only the Iranian and Kuwaiti off-shore has been opened, and the expectation was that Iraq would follow soon after the UN sanctions were lifted. This expectation was based on the (pre) contracts of Iraq with oil companies from Russia, France and China. Yet, the competition among oil companies in the Persian Gulf was seriously hampered by international politics. Iran still continued to be subject of American sanctions, while Iraq was subjected to UN sanctions. The participation of American oil companies in the Gulf region was therefore uncertain, and, like in Iraq, other companies and countries attempted to profit from this absence. The initial opening of Russia was a disappointment for the international oil companies because domestic capital was favoured over FDI and the investment climate was too uncertain. This focused the efforts of the international oil companies on the Caspian Sea basin, where access to equity oil was offered in the 1990s.

The demise of the Soviet Union and the subsequent break-up in 15 independent states in the early 1990s led to the creation of totally new political and strategic circumstances, also in Central Eurasia. Prior to the break-up of the Soviet Union, an exchange of ideas had commenced between the European Union (EU) and the Soviet leadership to intensify economic, and particularly energy, relations.[381] The EU member states recognised the enormous potential of greater access to the energy resources of the Soviet Union and the opportunity to partly diversify away from the increasing import dependence of oil and gas flows from the Persian Gulf. The creation of independent states in 1991 did not change the potential boost of energy relations but did complicate the circumstances under which these resources could be accessed. The Caspian Sea, which was already a known energy producing region, was now surrounded by four new littoral states, Russia, Azerbaijan, Kazakhstan and Turkmenistan, in addition to Iran. The

[381] This interest was expressed in the adoption at the EU Council meeting in Dublin 1987 of the Plan Lubbers, that would later develop in the European Energy Charter.

[382] Salameh, M.G., "A Third Oil Crisis?", *Survival*, Vol. 43, no. 3, 2001, p. 135; Petroleum Intelligence Weekly, August 18, 2003, p. 3. .

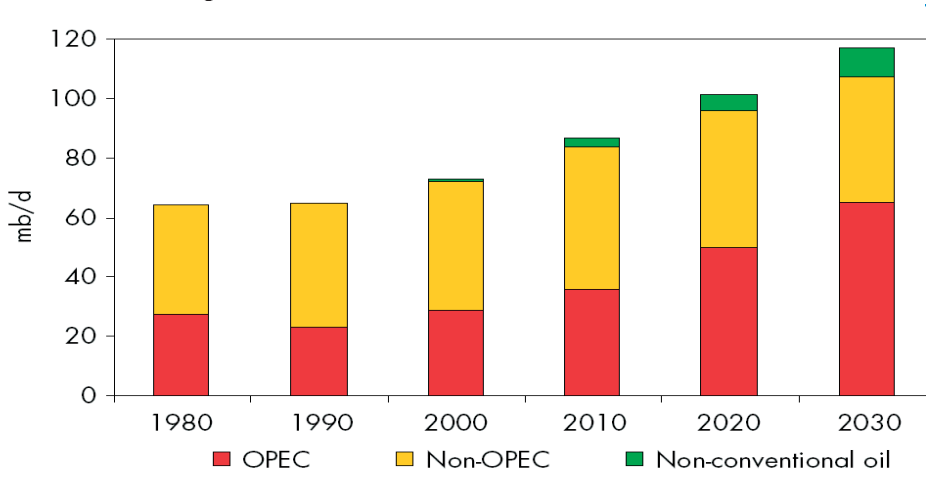
fact that Kazakhstan and Azerbaijan almost immediately opened up for FDI further excited energy officials and company mangers in major consumer countries around the world.

2.4.2 The future of oil

With current world oil consumption exceeding new deposit discoveries, and oil extraction from some oil provinces, like the North Sea and Alaska, starting to decline, OPEC's position in the world oil market will become more dominant over the years (see figure 6.4). OPEC member states own 60% of all proven crude oil reserves, but currently account for a much smaller share of world production.[382] The collapse of the Soviet Union has had a profound influence on the international oil economy. This economy is now characterised by open access to resources, with the clearest example being the introduction of the Caspian Basin into the world oil economy. The oil markets are no longer under government control and there has been a shift towards government and industry cooperation.[383] The influence of international oil companies has also increased significantly in the past decade. There are two reasons for this increase in importance of international oil companies.

First of all, many governments of oil-producing countries are re-opening their borders to foreign investments because of their need for capital, caused by the decline in real terms of crude oil prices since the 1970s. Secondly, technological innovation has revolutionised the oil industry by making it easier, cheaper and faster to find and develop hydrocarbon resources. Predominantly international companies have this technology plus the necessary skilled personnel acquainted with this latest technology.[384] Low oil prices in the late 1990s have prompted a series of giant mergers between international oil companies, which in turn has led to a greater concentration of knowledge in just a few companies. In the same period several Russian oil companies succeeded in finding their place on the international oil market.

Figure 2.4 World oil production



Source: IEA, *World Energy Outlook 2002*, p. 98.

In countries where international oil companies operate at least part of the production capacity, the oil industry is more focussed on efficiently running their projects because the level of outside scrutiny, both

[383] Morse, E.L., "A New Economy of Oil?, *Journal of International Affairs*, Vol. 53, no. 1, 1999, p. 1.

[384] Morse, *Op. cit*, 1999, p. 18.

in the capital markets and by the governments of consumer countries, presumes a certain degree of discipline on these activities.

A producer country that allows FDI is generally more transparent than a country that does not. Also the international oil companies have worldwide economic interests and produce their oil for the international market. In the past, oil produced by international oil companies always found the market, while oil produced by state companies, particularly those in the Persian Gulf, could not find a market or was withheld from the market to underpin OPEC pricing goals.
The private international companies want to secure a proper return on invested capital. Another major difference between an oil sector fully controlled by the state and a privately run but regulated oil sector is that investments in the latter case do not have to compete with other spending needs of the government. In the last 15 years, the budgetary problems of oil producing countries reduced the available investment capital for the oil industry in their countries but also thwarted the foreign ambitions of the state oil companies. The bitter complaints by managers of the Venezuelan state oil company, PDVSA, in the late 1980s and early 1990s are a case in point.[385] The ambition of companies like PDVSA was to vertically integrate into processing and distribution in the main consumer markets and secure demand for their oil. As a matter of fact, when oil income came under pressure in the past decade, the state companies were increasingly used as cash-cows and many times were forced to invest in domestic non-oil projects to make up for falling investment levels and lack of borrowing capacity in the economy. The efficiency of the state oil companies became seriously impaired as a result.

The competitiveness of some of the producing countries, despite the relatively low oil production costs, became a function of the government's budgetary problems. The low oil prices of 1997-1998 clearly showed that oil producing countries could not sustain at an oil price lower than $10-12 a barrel. This is particularly true for some of the Persian Gulf countries where demographic pressures on the government budget have become a driver of their oil policy. Increasingly these governments have to decide to mobilise capital in international markets. The costs for governments or a state oil company to mobilise the required investment capital are higher than for international oil companies, and increasingly international companies are invited to develop certain fields. The objectives of the government to stimulate production and maximise on oil income needs to be balanced against the rate of return that international oil companies expect to achieve. In general, in international oil companies, one project must compete (internally) with another project somewhere else in the world and the same minimum rules for the rate of return are applied. The investment climate that a government offers competes with that of other governments. In the case of the Persian Gulf, the contribution to world production (see figure 6.5 OPEC Middle East) is predicted to grow substantially. However, the capital required to expand the future production capacity must be mobilised either in the domestic economy or externally. If these countries are unable to mobilise the capital themselves, a return of international oil companies in the production of oil in these countries would be necessary. This would substantially change the organisation structure of the oil sector in these producing countries.

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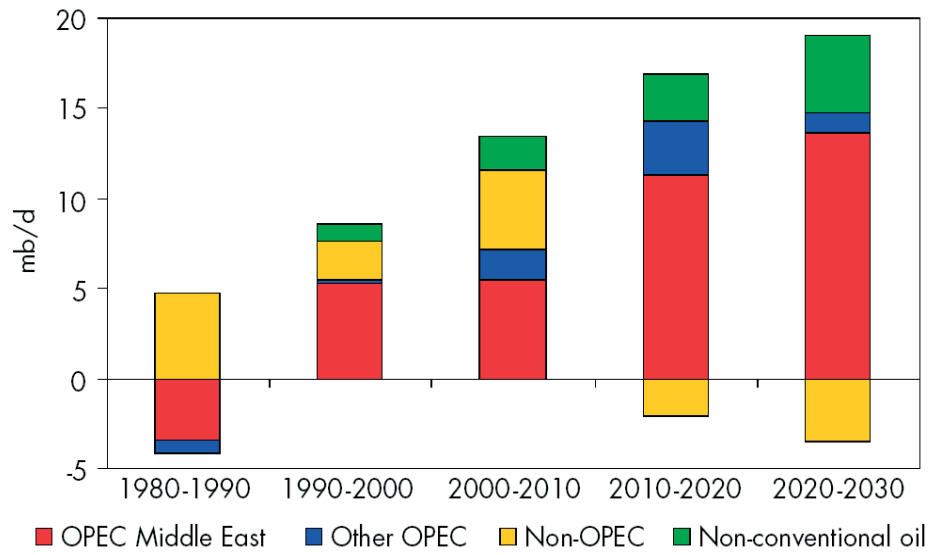
[385] Van der Linde, *Op.cit.*, 2000, pp.106-109.

[386] Manning, R.A., "The Asian Energy Predicament", *Survival*, Vol. 42, no. 3, 2000, p. 75.

Figure 2.5 Change in world oil production



Source: IEA, *World Energy Outlook 2002*, p. 100.

In a privately organised sector the investments have to compete with other investment projects of the company, mostly on a world scale. The incentive to produce efficiently is much larger. In an international oil market where many oil companies compete for equity oil, the likelihood of a supply gap materialising is smaller than in a market where state oil companies are the main investors. The opening up of the oil sector in Persian Gulf countries for FDI could be in the strategic interest of the consumer countries.

2.4.3 Recent OPEC policy

The very low oil prices in 1997-1998 and the subsequent sharp production cuts by OPEC in 1999 had a tremendous impact on the strategies of the international oil industry, and policies of the consumer and producer countries. This 1999 rise in the price of oil came after some years of relatively low oil prices. These low prices were the result of high levels of OPEC production, together with a falling demand as a result of the Asian financial crisis of 1997.[386] Low oil prices achieved one goal of OPEC's policy: to minimise oil exploitation in new areas such as Eurasia. It caused new exploitation efforts in these areas to be unprofitable at the time. But it came with grave repercussions for the oil exporting countries' balance sheets, as their oil revenues dropped dramatically. In 1999 OPEC decided to cut back production significantly.[387] The OPEC output decrease turned out to be successful, seeing that oil prices rose to levels acceptable to its member states. This was a very fortunate development for the Russian oil industry, which saw both its revenues and its market share grow without any effort on its side. Russian reinvestments of its oil revenues resulted in a spectacular rise in production of more than 500,000 barrels per day in the year 2000-2001.[388] High market prices provided Russia with increased revenues.[389]

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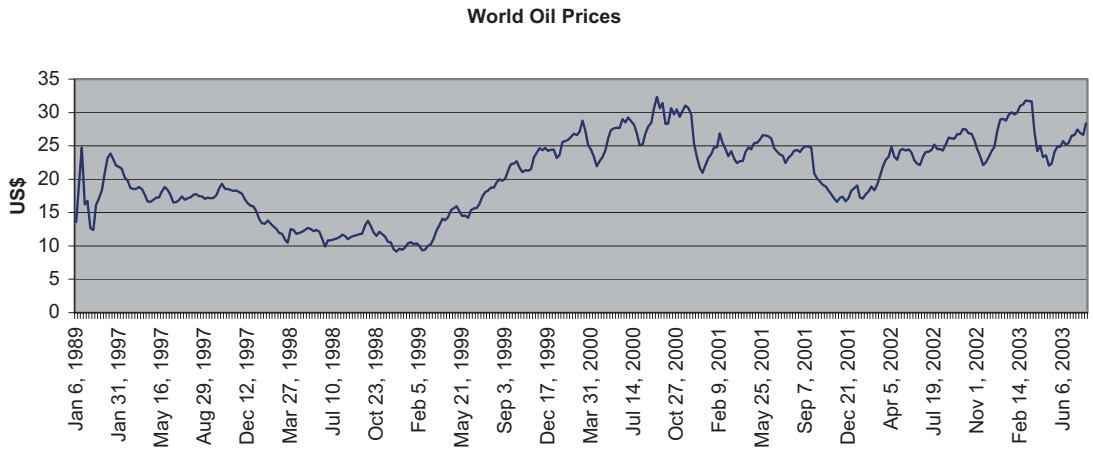
[387] Van der Linde, Van der Linde, C., *Bakkeleien om Olie*, The Hague: Clingendael, 2001, p. 11.

[388] Morse, E.L., Richard, J., "The Battle for Energy Dominance", *Foreign Affairs*, Vol. 81, no. 2, 2002, p. 16.

[389] Taxes on the earnings of Russian oil companies are a major source of income for the Russian government. See also Annex 1.

Figure 2.6 Average crude oil price development 1997-2002[390]



But there was also a structural reason for this price development. Oil prices remained low in the 1980s and early 1990s, and the major oil producing countries saw no reason to invest in their oil production infrastructure. As a result, spare capacity today, to be used in cases of emergency, is very limited and only available in Saudi-Arabia.[391] The lack of spare capacity poses a potential risk to the global energy security. The oil producing countries might not be capable of securing the same level of production if, for some reason, the oil supply of one of them is disrupted. Because of this risk of acute shortage, oil prices rose sharply in 1999. An increase in production in 2001, followed by falling oil prices, again created severe balance of payment problems for several OPEC members. OPEC decided to cut back on production again on 1 January 2002, by 1.5 million barrels a day. It had deliberately refrained from doing so in the wake of the 11 September attacks, but a decrease in world oil demands provided the logic for such a measure. Norway and Mexico followed suit, but OPEC political pressure resulted in only the slightest cutback on Russian production. Russia enjoyed a higher market share and increasing oil revenues as a result of OPEC policy.[392]

The international oil companies responded to the low prices in the 1990s with a wave of mergers and take-overs to consolidate their position. Companies that successfully adapt to the new market circumstances are in a better position to deal with a period of maturity or stagnation in the product cycle.[393] The purpose of this round of consolidation was to maintain market share and to be able to compete at rela-

[390] This table shows the average total spot price weighted by estimated export volume. During this period the maximum average price was $32.86 on September 8, 2000, and the lowest price was $9,32 on December 11, 1998. Source: psw13.xls, EIA.

[391] Morse, E.L., Jaffe, A.M., *Strategic Energy Policy Challenges for the 21st Century*, New York: Council on Foreign Relations, 2001, pp. 10, 23.

[392] Morse, Richard, *Op. cit.*, 2002, p. 16.

[393] De Jong, H.W., op. cit., 1981, pp. 110-113; Van der Linde, *Op. cit.*, 2000, pp. 127-150; Arthur, W.B., *Increasing Returns and Path Dependence in the Economy*, Ann Arbor (MI): The University of Michigan Press, 1994, pp. 1-12.

tively low oil prices. The economic hardship of the producer countries, including those in the Persian Gulf, had proven that, despite their low cost oil, the producer countries required for government income reasons a price above $12 a barrel. The companies attempted to develop their oil portfolio in accordance with this *de facto* minimum price at which OPEC would be forced to intervene. The resources of the Caspian Sea region, which were opened to FDI in the 1990s, were developed with this price floor in mind. The Caspian Sea oil could thus compete with OPEC oil. The competitive structure of the market as it developed in the late 1990s could only be challenged if low cost oil from the Persian Gulf would become available to some international oil companies and excluded others. Iraq's flirtation with oil companies, among others, from France, Russia and China and the exclusion, for political reasons, of British and American companies, acquired a different meaning after 11 September 2001, when the Americans were forced to re-evaluate their security of supply strategy.

The ability of oil producing countries to adapt to new market circumstances is much smaller than a company's ability to adapt. In 1998, the producer countries had insufficient economic strength to survive an oil price level of $10-12 per barrel. Despite the lower production costs of oil in OPEC countries[394] and the expected competitive edge, the dependence on oil income of the governments of producer countries turned out to be the economic breaking point. Income needs forced the producer countries to revert back to a short term solution for their economic problems and request OPEC to apply production cuts. Again the OPEC countries experienced the drawbacks of their swing producer role: the cost of stabilising the international oil market falls upon OPEC countries, while the ability to absorb these costs is declining.

The OPEC price band that was established in 2000 reflects the ever smaller margins for production policy-making. The band intended to make OPEC policies more transparent and predictable and to reduce the influence of politics on decision-making but it also intended to signal to the market that they would defend oil prices at the $22 a barrel threshold. This threshold reflects the income needs of the producer countries rather than the production costs and a means to defend their competitive edge. The ceiling price of $28 is designed to maintain demand for oil and to defend oil consumption of OPEC oil against other more expensive suppliers and other sources of energy. Yet, the price band cannot overcome the longer term pressure of increasing income needs and that technology will continue to drive down the price of relatively expensive oil sources and other energies.

Despite the overwhelming OPEC share of world proven oil reserves, competition from Non-OPEC oil production and other energy resources has forced OPEC into an economically costly position of swing supplier. Competition from Non-OPEC oil is predominantly competition from oil produced by international oil companies. The competition therefore also signifies a clash between models of market organisation in which economic rents are distributed over companies and governments of producer and consumer countries. The prospect of OPEC losing control over Iraq's production potential, in addition to the Caspian Sea and Russian developments, could potentially undermine the ability of OPEC in its present compilation to manage the oil market.

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394 The exploration, production and development costs are below $7 per barrel (and less than $2 per barrel in the Middle East), while these costs in Russia, Europe and North America are above $10. *The Economist*, March 6 1999, p. 23.

As a consequence, the consumer countries have been spoilt with relatively low oil prices between 1985 and 1999. These lower oil prices created the possibility to finance their environmental goals through all sorts of taxes and levies on oil products. Such incomes from oil in the EU countries were, for a while, higher than oil income of OPEC countries, and helped to balance the EU countries' government budgets.[395] The tax reforms that have recently been introduced in European countries continue this policy. The European countries were able to capture a fairly large share of the economic rents in the prolonged buyers market between 1985 and 1999.

The question is if the European assumptions about energy and energy taxation, which basically requires a buyers market, will remain valid in a situation in which producer countries and international oil companies want their fair share of economic rents too. The European assumptions are further challenged by the energy policies of other main consumer countries, like the US and China, that challenge the present equilibrium in the international market and compete for the same rents. Both the US and China are involved in a strategy in which the production of domestic resources are stimulated but at the same time, the governments are stimulating FDI to make sure that international supply can meet their demand. The taxation and levies policies of the EU could leave smaller margins to the international oil companies than in competing consumer countries and cause international oil companies to redirect flows there. Such an outcome would run against the security of supply interests of the EU and could force EU policies to adapt to policies in other main consumer countries.

Despite the relatively low oil prices in the past 15 years and the fact that OPEC's share of the world market was modest compared to their share in oil reserves, the major consumer countries began to worry about the future structure of supply, when Non-OPEC supplies would begin to decline. Strategies to balance the foreseen increasing import dependence on Middle East against other sources of oil, already led to fierce competition for control over Caspian Sea resources and the pipelines routes that would bring out the oil among these consumer countries.[396] The conflict over Iraq underlines the strategic importance of access to relatively cheap oil and gas flows. The present controversy over Iraq is not only a product of future concerns about security of supply but also a product of past international strategic and political manoeuvring. The period in which OPEC dominated international oil markets did not bring much needed political reforms in the countries in the Middle East nor the economic independence of oil income that would have created macro-economic stability. Short-term domestic problems run the oil agenda of many producer countries.[397] Recent attempts to keep political issues away from OPEC production decision-making have not convinced consumer countries that the countries can head off the volatile domestic and regional political situation without using oil to manipulate the agenda.

3 The future of natural gas and LNG[398]

The world gas industry is currently in a period of expansion. Gas projects everywhere in the world are brought on stream, of which many are Liquefied Natural Gas (LNG) projects. The market for gas con-

[395] OPEC, *Why you pay so much for gasoline and other oil products*, graph 4, http://www.opec.org.

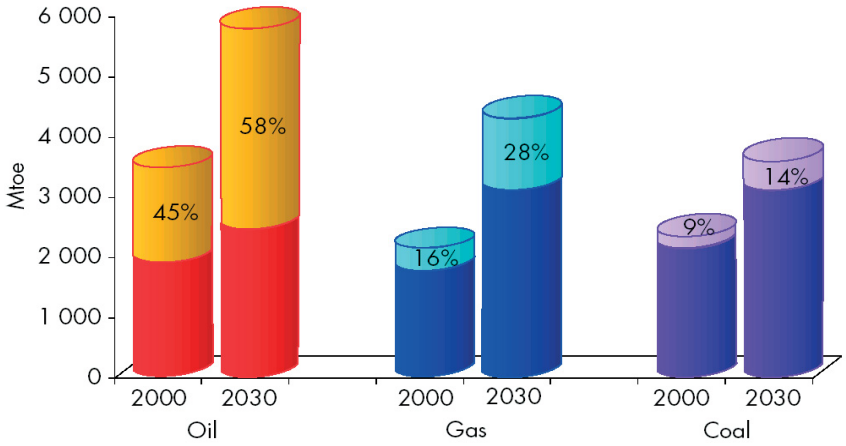
[396] Amineh, *Op. cit*., 2003, pp. 3-5.

[397] Van der Linde, *op.cit*., 2000, pp. 79-88.

[398] CIEP *Op. cit*, 2003.

sumption is, however, currently very much a regional market. The Asian gas market is a typical LNG market because the distance and the physical geography of supply and demand did not allow gas to be exported to the consumer markets otherwise. The Europe-Russian and North American markets are typical pipeline markets. Gas is supplied to the consumer markets by pipeline and in the case of the Russian supplies very long distance pipelines. Recently, LNG supplies are also reaching these gas markets and are projected to grow substantially in next decades.

Figure 3.1 Share of Net Inter-Regional Trade in World Fossil-Fuel Supply



Source: IEA, *World Energy Outlook 2002*, p. 71.

The growth in the LNG market is due to the growing demand in OECD markets for gas and the distribution of gas reserves in the world. Until recently, much of the world gas reserves were stranded because they could not be brought profitably to the market. The larger demand for gas and the cost reductions that were realised in the LNG sector have changed the outlook on at least some of the gas reserves. The expansion of gas trade was closely related to the ability to transport gas to a consumer market and developed mostly within a certain region. The development of the North American and European-Russian market relied on pipelines to transport gas. In Asia, LNG could develop because the governments were keen to diversify away from oil. The relatively high costs were carried by the market. Only recently, cheaper LNG supplies are beginning to reach the markets. Compared to the international oil market, the international gas market is far from mature and far from international. The small volumes of LNG that are traded on the spot market are an indication that inter-regional trade is developing, but given the high costs of building LNG capacity, inter-regional trade in the coming period will continue to develop along the structure of long term contracts rather than a spot market.

3.1 Gas reserves and production

The world gas reserves are not as concentrated as the world oil reserves. Yet, two-thirds of the world's gas reserves are found in the Middle East, Caspian Sea region and Russia, the regions that the world also relies upon for their future oil supplies. The gas reserves of Russia and the other states of the former Soviet Union are vast with about a third of world proven gas reserves. These reserves are matched by the proven gas reserves in the Middle East. Particularly Iran has large reserves, about 15% of the world

proven reserves. Other regions have more moderate reserves compared to Russia and the Middle East, but these reserves are substantial enough for developing the domestic gas markets and exports. The ratio of gas reserves to production is currently about 60 years, compared to about a little over 40 years for oil.[399] Intense exploration for gas is much more recent than oil exploration and in the past decades major additions to reserves have taken place. The natural gas industry is much less mature than the oil industry. Yet, with the predicted demand for gas to grow substantially, new additions to reserves are required to maintain the long term availability of gas. The current number of countries with significant gas reserves is about 90. In terms of probable reserves or resources, Russia and the other former states of the Soviet Union outstrip the Middle East in potential reserves. This again underpins the importance of Russia as an important supplier of the EU and in the future also the Chinese market.

Table 3.1 World natural gas reserves (tcf)

Continent/Region	Oil & Gas Journal Jan 1, 2003	World Oil Year-end 2001	BP Year-end 2002
North America	252.354	271.285	252.400
Central & South America	250.083	250.223	250.200
Western Europe	191.568	182.440	186.200
Eastern Europe and Former SU	1964.175	1950.524	1930.000
Middle East	1979.675	2367.917	1979.700
Africa	418.162	477.059	418.100
Asia & Oceania	445.407	419.921	445.300
World Total	5,501.424	5,919.369	5501.500

Source:www.eia.doe.gov/emeu/international/reserves.htm

Contrary to the gas reserves of the former Soviet Union, the gas reserves of the Middle East hardly have been developed. The costs to bring the gas from the Middle East to the market were too large. As a result, most of the Middle East gas reserves were stranded. Only in the past decade, LNG projects in Qatar and Oman were developed to export gas.

Gas production is particularly developed in the US, Europe and Russia. The share of production of North America was 30.3% in 2002, of Europe about 11.3% and Russia 22%, while the share of consumption of North America was 31.2%, of Europe 17.5% and Russia 15.3%.[400] The share of production of the Middle East was about 9.3% in 2002, while the share of consumption was 8.1%. The main exporters by pipeline are: Russia (128.2 bcm), Canada (108.8 bcm), Norway (61.2 bcm), the Netherlands (42.7 bcm) and (Algeria (30.9 bcm) and the main LNG exporters are: Indonesia (34.3 bcm), Algeria (26.8 bcm), Malaysia (20.5 bcm), and Qatar (18.6 bcm).[401]

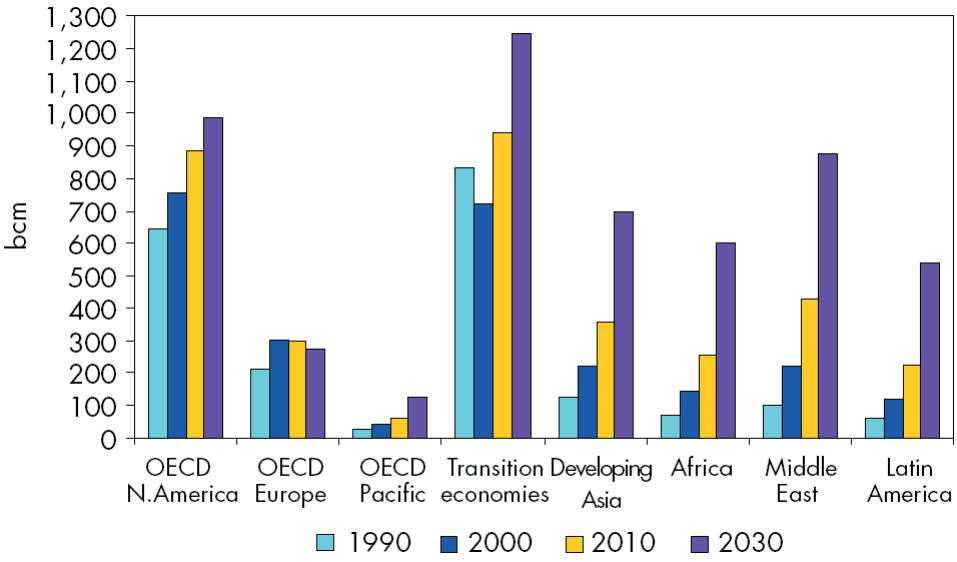
399 IEA, *Op. cit* 2002, p. 113.

400 *BP Statistical Review of World Energy* 2003, pp. 22, 25.

401 Ibid., p. 28.

The substantial increases in gas production in Asia, Africa, the Middle East and Latin America in figure 6.8 illustrates the fact that much gas was stranded and that developments in gas demand in the region and LNG are expected to unlock these reserves. Europe is the only region where gas production is close to peaking and production will level off in the coming decades. The dependence on imported gas will increase, and supplies from Russia, the Middle East and North Africa will expand substantially, if these new additions to production can be realised. Also the IEA recognises that there is a degree of uncertainty regarding the realisation of new production capacity.[402] These reservations are based on the costs of developing these capacities, the technologies that are required, the gas price developments, the oil and gas depletion rates, and the project risks in an uncertain geopolitical development.

Figure 3.2 Natural gas production by region



Source: IEA, *World Energy Outlook*, 2002, p. 115.

3.2 LNG[403]

The elements of the LNG chain are liquefaction, shipping and regasification. For each, advances in technology and design have led to significant cost savings and efficiency improvements, which have enhanced the competitiveness of LNG as a credible option for gas supply.

3.2.1 Liquefaction

The liquefaction process is expensive, but four decades of technological developments have resulted in a 50% reduction in liquefaction costs. As part of this process, the optimal size of a liquefaction unit (train) has increased from 1–1.5 mtpa to a projected 4.5–5.5 mtpa and beyond for the latest generation of trains (even train sizes of 7 mtpa are now being considered).

The cost of an LNG plant is currently of the order of USD 250/tonne/year for a one train plant. A second train yields improved unit costs through the sharing of common facilities, to an amount of approxi-

[402] Ibid. p. 116; and see also CIEP, *Op. cit*, 2003a.

[403] CIEP, *Op. cit*, 2003b.

mately $ 200/tonne. Projections for further cost reductions of around 20%, through technological improvements, shorter construction times and increased train sizes are becoming realistic prospects.

3.2.2 Shipping

LNG is transported in ships, especially designed and insulated to minimise loss and maximise safety. There are currently some 140 LNG carriers in operation. The size of these ships has increased over time. The capacity of a typical state-of-the-art carrier is some 145,000 cubic meters (m^3) of LNG. Further increases in size to 160,000 m^3 and beyond (200,000 m^3 is being considered) and improved insulation systems are amongst the measures that could lead to further cost reductions. The cost of a new LNG carrier is about $ 170–190 million (for a 145,000 m^3 ship)[404], a price, which varies with availability of building capacity in shipyards.

The number of ships needed for an LNG project depends on the distance to the market. For example, an LNG project in Nigeria requires 5.5 ships for the supply of 5 mtpa of LNG to European markets, whereas deliveries of the same volume from Algeria to Europe require only two ships.

3.2.3 Regasification

Regasification takes place in a receiving terminal in the country of destination. Essentially a simple process, the unit costs of unloading LNG carriers, storing and regasification of LNG are considerably lower than those of a liquefaction plant. Further cost reductions have been realised through shorter construction times, larger storage units and design improvements based on rationalisation of safety measures. In addition, there are synergies to be found in developing on-site power generation, as lower air inlet temperatures can increase electricity-generating efficiencies by up to 10%.

3.2.4 LNG costs and supply characteristics

The high costs of an LNG project are a characteristic that LNG has in common with long-haul gas pipeline projects. It is difficult, however, to apply a standard cost estimate to LNG projects. Costs can vary considerably, depending on many factors such as location, availability of supporting facilities and the distance to market. For the purpose of this paper it suffices to give an indication of the cost dimension of LNG projects. For example, typical costs for a 4.5 mtpa LNG project from the Middle East, destined for the European market, could be of the order of $ 2.5 billion, including a regasification terminal. Similarly, the unit costs of LNG show the same spread, augmented by different assumptions regarding funding costs and costs of capital. Given this qualification and using the above project development costs, the order of magnitude of unit cost could be as much as $ 2.50/MMBtu for the LNG process of liquefaction, transportation and regasification at the border of a receiving country. These costs exclude the costs of finding and producing the gas, and delivering it to the LNG plant. In the Middle East these can add between $ 0.50–0.80/MMBtu to the costs, but benefits of condensates and LPG recovered from the gas can make the net gas costs very low or sometimes even negative.

For oil developments, the costs of taking the production to the market are only a fraction of the costs for gas, including LNG. Combined with the rigidity of the gas chain (i.e. little elasticity and the limited num-

[404] WGI June 5, 2002, p.3.

ber of buyers, terminals and ships), these high up-front costs create a very different risk profile for LNG projects than for oil projects. For many LNG prospects, costs and risks are too high to make a project economically viable in its own right. In those cases more supportive conditions are needed to make the project feasible, such as the associated production of oil and tax incentives from the host government. Even under these circumstances, the feasibility of the project in today's price environments depends highly on the assurances of a high, uninterrupted level of LNG supply. Given the current size of the market, it is difficult to envisage such assurances without supporting arrangements in targeted end markets.

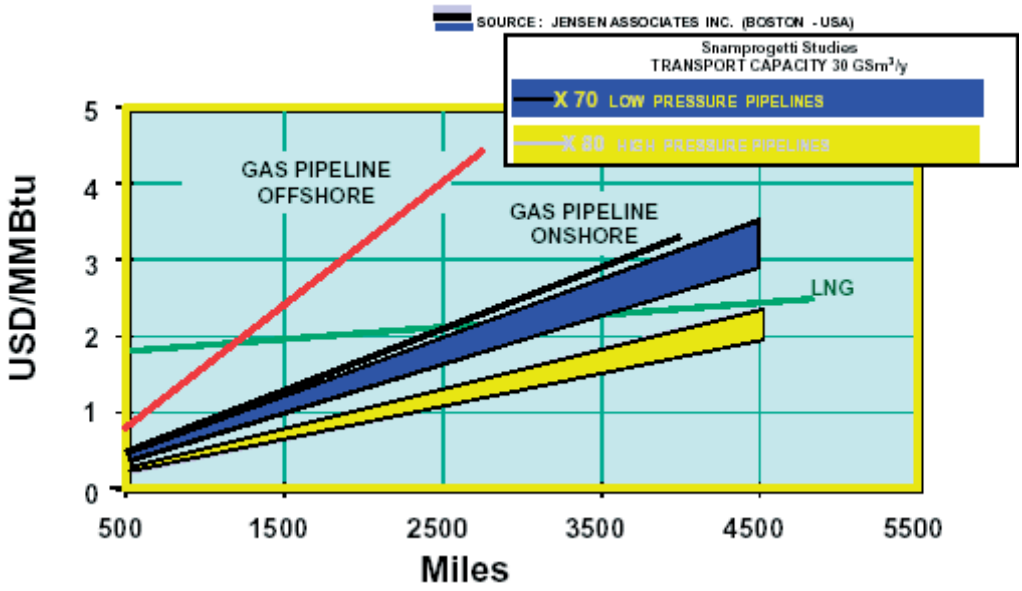
Contrary to oil, there is no global liquid market for LNG. Spot markets are developing but still represent only a small percentage of the total volumes. Moreover, this market is very sensitive to price differentials between markets and to the availability of spare terminal and shipping capacity. To achieve a high and steady off take level, the LNG producer needs a deep understanding of specific potential gas markets, of the preparedness of buyers in these markets to purchase LNG for the long-term, and of the availability of the local infrastructure to take the LNG when production will start. This remains a key difference between gas supply and oil supply from remote locations: gas projects need the active involvement and (contractual) commitment of credit worthy buyers in the market to establish an economic and bankable basis for new supplies. The sensitivity of the economics to high off take levels requires that investors and lenders (and participating host governments) create conditions for secure uninterrupted supplies, an aspect that is not needed in the same way for oil projects. Long-term contracts between LNG producers and buyers have thus produced efficient, well-tuned LNG chains and have provided that security to both the producing country and the receiving market.

3.2.5 LNG and pipeline gas

Not every gas producer has the luxury to choose between LNG and pipelines to transport gas to export markets. Often there is only one option: either pipeline (e.g. when the source is landlocked or its seas freeze over) or LNG (e.g. in the case of intercontinental trade). But where such a choice exists there is a marked difference in cost build-up versus distance to market (see Figure 6.9).

An LNG project, along the chain from production to the market, has a high cost threshold, but distance to the market is not as crucial as for pipeline delivery. The costs of a gas pipeline project are highly sensitive to scale and the distance to the market. Where there is a realistic and politically acceptable choice between LNG and pipeline for bringing gas to a market, distance from the supply source to the market is a decisive economic factor. Southern Europe is the main market area for LNG as it lies at the far end of a long pipeline trajectory from gas supply sources into the north and the north-east of Europe (the pipelines from Algeria into Spain and Italy are relatively new); countries like Spain and Portugal rely on LNG to access competitive gas supplies (as well as for diversity of supply). North-western Europe has consistently found that pipeline gas provides a more economic option (for example, German gas companies own the site of a potential LNG receiving terminal but this site has yet to be developed).

Figure 3.3 Costs of different gas transportation systems



Source: CEC, *Green Paper – Towards a European Strategy for the Security of Energy Supply*, COM (2000) 769 Final: p. 29.

Reducing costs of supply for LNG and pipeline gas and high gas prices at levels associated with oil prices of $ 20–25/bbl have improved the feasibility of gas projects. Thus more choice of supply prospects has been created, extending the economic reach of LNG and pipeline gas supplies. Another factor is the technological progress that has been made in off-shore pipe-laying, which has been demonstrated in for example, the Trans-Magreb, Medgas and Blue Stream projects. The supply envelopes of LNG and pipeline gas are thus overlapping more than in the past. The stark distinction between LNG markets and pipeline markets, based on cost of supply has faded and more markets are now in a position to investigate both options.

Off-shore LNG terminals and on-board regasification processes are currently being discussed and developed as new ways to access markets. These are virtually always more expensive and certainly have more supply limitations than on-shore terminals. Their main attraction is that they may allow the market to get around permit problems, which are amongst the main obstacles for LNG terminals.
Costs are not the only determinant for the choice between LNG and pipeline supply. Other factors include:

- Pipelines may have to cross many countries, whereas LNG trade normally only involves the supplying and the receiving country. The absence of transit negotiations and treaties (and possibly high transit costs) simplifies the project development process in the case of LNG and makes for shorter development times (and may offer an additional cost advantage).
- 'Security' aspects are complex. An extended pipeline system, transiting many countries, poses supply security issues. For LNG these are more contained, as transit through other countries normally does not occur. The security exposure of ships as 'moving parts' of an LNG project,

on the open seas or in harbours, is a different aspect which to-date has not given rise to major concern.

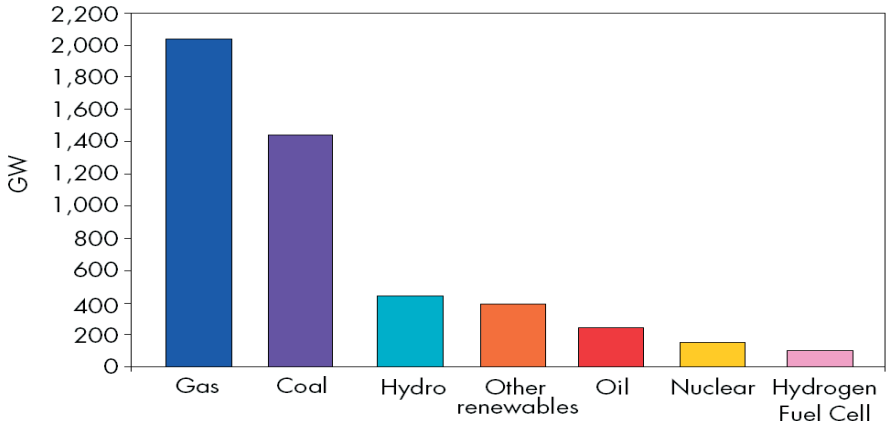
- Diversity of supply is yet another aspect of 'security'. For a number of markets LNG offers a realistic alternative to a single dominant supply source.
- As the LNG market grows, so does its ability to offer flexibility of supply between markets: if a market cannot take delivery of a cargo, the ship can be redirected to another terminal. If a supply source experiences a problem, a cargo can be shipped to the market from another source (in a well-developed market like Europe this flexibility is also available from pipeline gas).
- The current economic LNG supply size is of the order of 3.5 mtpa (5 bcm/a) although this figure is still rising: long-haul pipelines need throughput volumes, and hence a market, of up to four times this volume to achieve competitive economies of scale. This can be a disadvantage in view of the capacity of markets to absorb incremental supplies of this size, unless markets (and hence buyers) can combine to acquire the supply from one pipeline.
- It has become increasingly difficult in many countries to obtain the necessary permits to build an LNG receiving terminal. This could become a serious impediment to growth.

From an environmental perspective LNG 'losses' (i.e. own use of gas) are of the order of 8–11% for the whole chain over a distance of 3000 kilometres compared with 10–11% for pipeline gas transported over the same distance. With regards to safety performance, LNG has a very good track record. Further, extensive research has established that the effect of any at sea shipping accident would not be catastrophic and would have only a limited environmental impact.

3.3 Gas demand

In the past decades, gas has become an important fuel in the energy mix of many countries. The gas market was initially developed with domestic supplies in North America and Europe. The wish to diversify away from oil further stimulated the gas industry in these regions. The rapid development of the European gas market was due to the discovery of major gas fields in and around Europe, starting with Groningen, in 1959, and was supported by the establishment of an effective supply and distribution industry. The convenience and price competitiveness of gas enabled it to take over the heating market in all regions where a gas infrastructure could be economically established. Natural gas now has reached a significant share in both the home and industrial heating markets in many countries and continues to make further inroads in these market segments elsewhere.

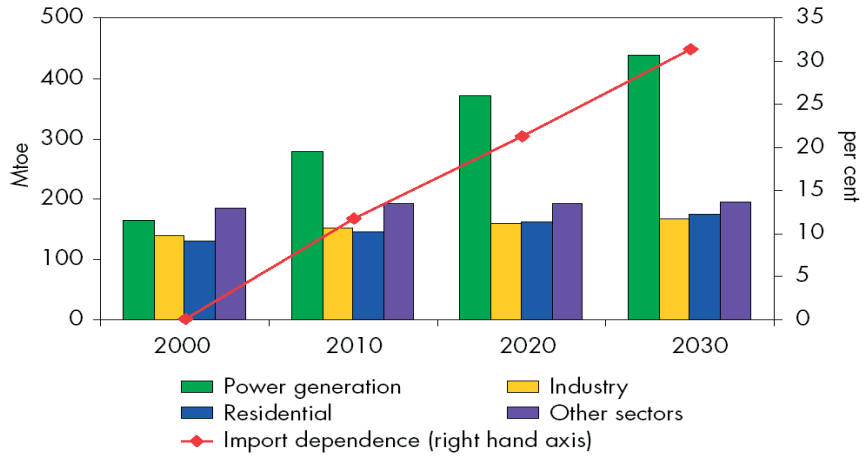
Figure 3.4 World electricity generation capacity additions, 2000-2030



Source: IEA, *World Energy Outlook 2002*, p. 131.

In the power generation sector gas has been a late starter. For quite some time gas was considered a noble fuel that should not be burned in electricity plants. This principle was laid down in the 1970s EU Directive against the use of gas for power generation. Instead, the use of coal and nuclear power was stimulated. But the public resistance in some countries to nuclear power, particularly after the accidents in Harrisburg and Chernobyl in the 1980s, paved the way for other options. The growing awareness of environmental degradation as a result of CO_2 emissions was the incentive for a major breakthrough for gas in the power sector.

Figure 3.5 Natural gas demand in the United States and Canada



Source: IEA, *World Energy Outlook 2002*, p. 151.

In 2000, gas-fired power generation accounted for some 12% of total electricity generated in the EU and it is the power sector in which gas is generally considered to have the greatest potential to grow. As a

result, demand for gas is predicted to grow faster in the next decades than demand for oil.[404] The boost in gas demand will particularly be realized when CO_2 will become priced in the EU, and the environmental advantages of gas can be captured.

Table 3.2 Natural gas import dependence

	2000		2030	
	bcm*	%**	bcm*	%**
OECD North America	5	1	345	26
OECD Europe	186	36	625	63
OECD Pacific	83	67	121	50
Transition economics	-112	-18	-277	-29
Africa	-69	-130	-299	-125
China	0	0	47	29
Other Asia	-60	-36	-94	-19
Latin America	-10	-9	-103	-28
Middle East	-23	-11	-365	-85

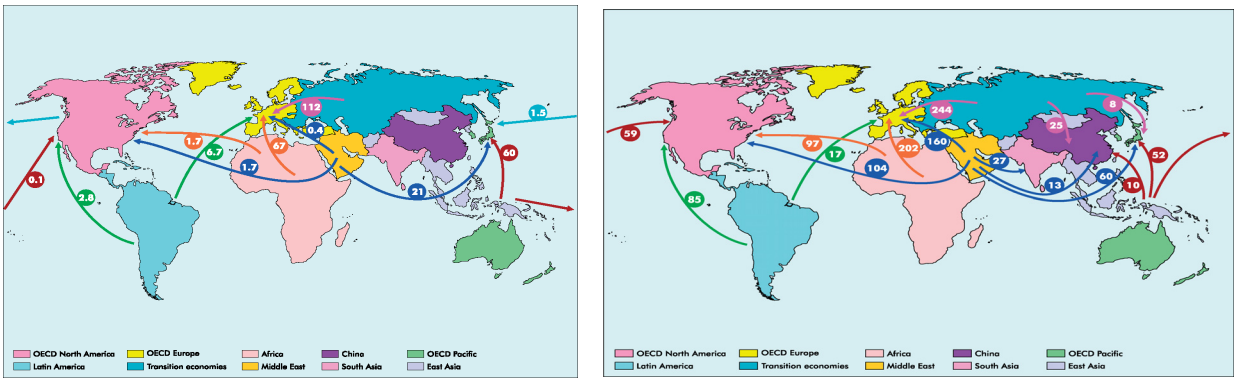
Source: IEA, *World Energy Outlook 2002*, p. 117.

Gas demand in the US is also predicted to grow. To satisfy this growing demand, the US will become increasingly import dependent from further away sources than Canada and Mexico. Currently, the US is looking at the possibilities to increase LNG imports to meet its growing demand for gas. Another boost to the LNG sector is the wish to diversify to origin for security of supply reasons and the growing demand for gas imports in China that can only be partially satisfied by gas supplies from Russia.

The growing demand for gas in North America, Europe and Asia and the growing call on gas supplies from elsewhere will greatly impact the size and the intensity of inter-regional gas flows (see figures 3.5 and 3.6). The development of the precise gas flows depends largely on the sequence with which the gas projects are brought on stream. Due to the heavy dependence on demand for electricity, the available gas infrastructure in the consumer country or region, the strong link in liquefying, gasifying and transportation capacities, and the capital intensity, the market will not be able to absorb many new sources at the same time. Rather, security of supply and security of demand are closely linked in these developments. The liberalisation process of the gas markets in the US and the EU, if security of demand cannot be secured with long term contracts, could stand in the way of the expansion of their gas markets.

[405] IEA, *Op. Cit.,* 2002, p. 90 and 110.

Figure 3.6 Net inter-regional natural gas trade flows, 2000 and 2030 (bcm)[406]



3.4 The EU energy market[407]

In less than 40 years natural gas has become a household word in many European countries and many global and European energy studies gas demand is predicted to continue to grow.[408] Europe should continue to significantly increase the share of gas in its energy supply portfolio in order to benefit from a clean, low carbon, energy supply with clear economic advantages.

It is widely recognised that a transition to a sustainable energy economy will take a long time, possibly another fifty years. This means that the world, and thus also Europe, must accept a continued and increasing use of fossil fuels during that period. Of these fuels, natural gas properties and applications have the least environmental impact. Moreover, natural gas and the gas infrastructure offer the best opportunities to develop a hydrogen economy. Hence, natural gas is widely presented as the *bridge to a sustainable energy system*. Yet, for such a development to take place, we have to bear in mind that the future growth in natural gas demand will have to develop in a context that is radically different from that of the past. The main distinctions are:

- First, the EU gas industry is in a process of radical restructuring, as a consequence of the implementation of the 1988 EU *Single Energy Market* project. Shaped by the 1994 Hydrocarbons Directive (94/92/EC, 30 May 1994) and the 1998 Gas Directive (98/30/EC, 22 June 1998), this process fundamentally changes the behaviour and strategic outlook of the various actors in the gas market, including governments, up- and down-stream gas and other energy enterprises, financing institutions and consumers.
- Second, a more significant role for natural gas will have to emerge in a situation in which the indigenous supply of gas is assumed to decline - possibly in absolute terms, but surely in terms relative to demand. Increasingly, the future will require steady supplies of gas from far away sources, external to the EU, to fill the predicted gap between supply and demand.

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406 IEA, *Op. Cit.,* 2002, pp. 118, 119.

407 CIEP, *Op. Cit.,* 2003a.

408 Such as: IEA, *Op. Cit.,*, 1995; IEA, *Op. Cit.,*, 2001; IEA, *World Energy Outlook 2001 Insights*, Paris: OECD/IEA, 2001; CEC, *Op. Cit.,* 2000.

Both issues, within their own right, have been discussed in the analyses referred to above and in many other papers.[409] By and large, the conclusion of these studies is that we will need those extra supplies and that the emerging market and industry structure will take care of their supply, if the right institutional and economic context is provided.

Most studies and analyses that underpin the predictions regarding the performance of a future liberalised European gas market draw on economic theory that is empirically supported by past experience and analyses of developments in the US and the UK gas markets and a variety of non-gas markets. Several problems emerge from this analytical approach that makes the application of those theories on the continental European gas market less robust. The main problem is that the physical, geo-political and economic characteristics of the US and UK markets (like self-sufficiency, many producers and short distances to market) radically differ from those in the European gas market. Particularly the reality that considerable amounts of gas will have to be produced far away, such as Russia, North Africa, the Caspian Sea region and the Persian Gulf, complicates the understanding of what a liberalised market may lead to.

3.4.1 Completion of the internal energy market

In the past decade, the level of integration has intensified and the competence in economic policy-making has progressively shifted from the member states to the EU-level. This is best illustrated by the implementation of the Economic and Monetary Union in 1999 and the introduction in 2001 of the Euro in 12 of the 15 member states. In 2004, the EU will experience its biggest enlargement to date, when 10 East European countries become member states. Liberalisation of energy markets in the EU, the Euro and enlargement require that also energy policy, particularly crisis management, but perhaps increasingly also market regulation when national energy markets become more fully integrated, should progressively be coordinated at the EU level. This coordination is required to create market efficiency across national borders, to efficiently implement environmental policies and last but not least to efficiently deal with security of supply issues.

The perceived end-goal of the internal energy market (gas and electricity) is that production (or trade), transportation, processing, and distribution will be organised in such a way that the organisation and boundaries of the relevant market (which can be a regional market in Europe with spill-overs in other regional markets to allow proper arbitration and competition) is decided on technical criteria (like the cost of transportation) and economies of scale and scope rather than on a mere national basis. The difficulties with the realisation of the internal energy market do not lie in the conceptualisation of this mar-

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[409] Stern, J., *Traditionalists versus the new economy: Competing Agendas for European Gas Markets to 2020*, Briefing Paper No. 26, November 2001, Royal Institute of International Affairs, Energy and Environmental Programme; Stern, *Op. Cit.,* 2002, Hough, D., Concha, R., *The European Gas Directive: Will it Lead to an Open and Competitive Market in Gas?*, NERA Energy Regulation Brief 5, London: National Economic Research Associates, June 2000; EGRF (European Gas Regulatory Forum), *A Long-Term Vision of a Fully Operational Single market for Gas in Europe: A strategy Paper (Draft),* Prepared by the Joint Working Group of the European Gas Regulatory Forum, 28 January 2002 (http://europa.eu.int/comm/energy/library/strategy-paper-draft-28-01-2002.pdf).

ket but in the difficult process to achieve this market. The process is not always driven by efficiency but rather by political compromises.

Certain elements of energy policy can be efficiently dealt with through subsidiarity, like energy-saving. Energy saving targets can easily be formulated, while the methods of achieving these targets can be left to various levels of government or the market. However, other elements of energy policy are less easily left to subsidiarity in an internal energy market setting, like crisis management and agreements to co-operate in international organisations. Policy-making at the EU level should allow for both diversity and convergence. Diversity in the energy sources but convergence in market conditions. The complicating factor today is that one must make a difference between the desired end-goal of the internal energy market and the process and route that will achieve these goals. The energy economy of the member states is, as stated, diverse, and the diversity will increase with the accession of the 10 new member states. Particularly the organisation of the various national energy markets and the level of state intervention still require fundamental adaptations in these countries in order to create sufficient convergence in market conditions on a European level. Most of the measures *en route* to the internal market are compromises among the various (perceived) national interests of the member states and often represent the lowest common denominator. However, sometimes it is possible to adapt to higher standards. Particularly the coming enlargement has allowed for certain policy measures to be adopted because the fear of incomplete regulation or cross-border risks spilling over into the EU-15 creates an incentive to make breakthroughs. For instance, there is now support for the creation of a system of managing the strategic oil reserves through a public body which makes an end to the current mixture of publicly and privately held reserves and creates more transparency and reduces the risk of member states free riding on the strategic reserves in another member state.[410] Yet, this measure does not completely reduce the risk of a regional crisis spilling over in other EU regional markets, because technical and infrastructural bottlenecks, like pipelines and pipeline capacity, to make the system work efficiently at the EU level have not been resolved.

The recent change in the oil crisis management system by harmonizing the management of strategic stocks is only one step towards EU energy crisis management. When energy markets in the EU are fully liberalised, production and consumption patterns will change. The location of production facilities will adapt to the new market circumstances and more cross-border trade in energy is expected. Regulation at the level of the member state will be incomplete and requires more coordination at the EU level (or relevant market level for electricity), not only to secure a level-playing-field but also for crisis-management and long term security of supply issues. Typically in a crisis, markets will not function properly or fail and the market will not be able to produce the public goods, like a reasonable price, environmental protection and security of supply.

The problem of looking ahead in the present market circumstances is that the liberalisation process is far from complete. The EU is a work in progress and end-goals are still being defined and redefined. Although the end-goal of full integration of markets, including energy markets, is at least hypothetical-

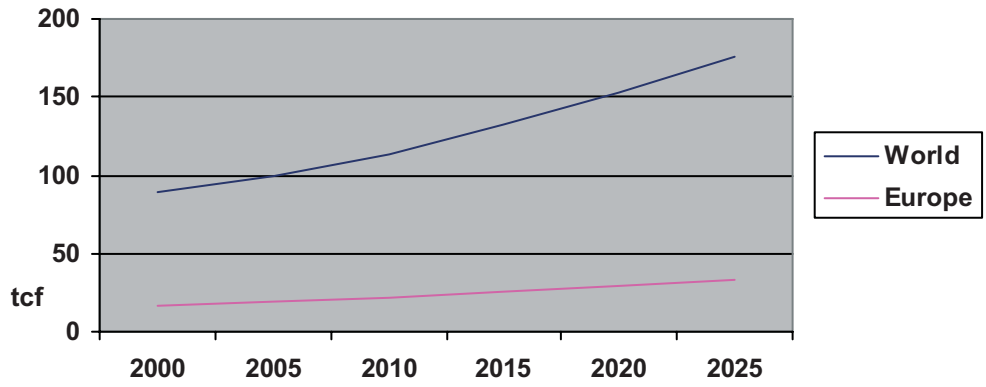
[410] CEC, *Proposal for a directive of the European Parliament and of the Council concerning the alignment of measures with regard to security of supply for petroleum products,* Brussels, 11 September 2002.

ly clear, there is still much uncertainty about the process and the final outcome. This has inspired governments in two broad approaches, those that engage in a race to the top (i.e. implement full liberalisation as quickly as possible and hope to set the standard) and those that engage in a very cautious strategy and move with the speed of the lowest common denominator. The speed at which the process of liberalisation can move ahead is crucial because the longer the process takes, the longer the market structure uncertainty continues and the longer the incomplete regulation can persist. Politically, the transition period is the most risky because governments are still compelled to act in the member states short term interest and may therefore not always support measures to complete the liberalisation process. In this sense, the complicated decision-making procedures and the democratic deficit are also taking their toll on the internal market. Economically, the transition period is risky because investment strategies become more uncertain in an uncertain regulatory environment. In this sense, time has become an all deciding factor to determine exactly the level of risk to the national public goods, including security of energy supply.

3.4.2 Growth in EU energy demand

In spite of the significant energy savings and improvements in energy efficiency that have been realised in almost every market segment, there appears to be reasonable consensus that Europe will continue to need more energy over the next 50 years, with growth of demand ranging from 0.5 to 1.5% per year, over the next 20-30 years, depending on economic growth. Yet, there will be quite a large variation among individual countries, regarding the patterns of efficiency improvement, industrial restructuring and the consequent growth in energy demand. Focussing on the current EU-15, the CEC Green Paper predicts total primary energy demand to grow by around 11% from 1,454 mtoe in 2000, to around 1,600 mtoe by 2020 (see figure 6.13).

Figure 3.7 World and European gas gemand outlook



Source: EIA, *International Energy Outlook*, 2003, p. 186.

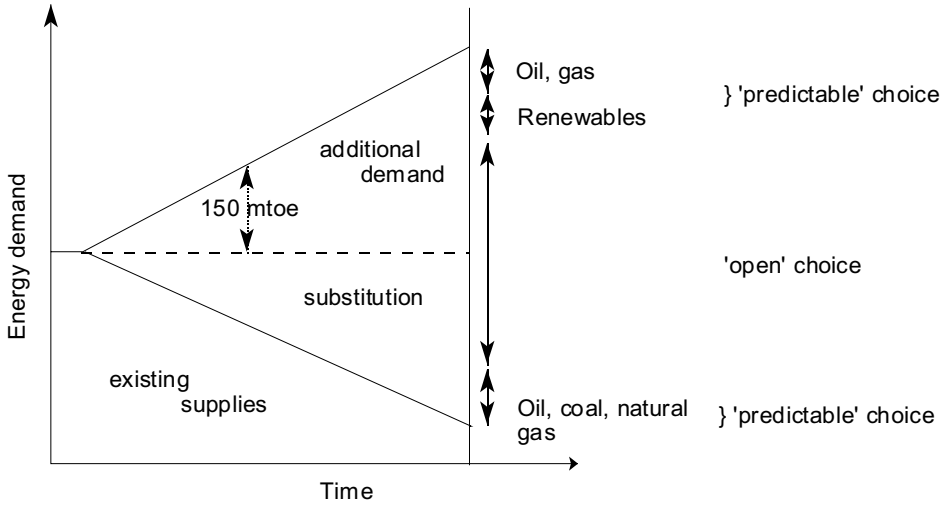
The residential and service market accounts for 40%, the transportation market for 39% and the industrial market for 21% of the growth in final energy demand. Since the share of electricity in final energy demand increases, electricity generation will rise by almost 40%, requiring substantial increases in

investments in generating capacity (with more differentiation between peak-load and base-load generation capacity) and taking up around 110 mtoe of additional fuel inputs.

The prediction with regard to growing demand need to be further specified. Figure 6.15 illustrates how energy demand develops. 'New' demand for energy in the EU emerges from two segments. The first of these, "substitution", involves the replacement of old energy appliances and equipment by households and industry and retired plants by the power sector, with the consequential choice of fuel. The second segment involves the additional demand for energy associated with the ongoing growth of the economy and the population, the resulting expansion in the transport sector, in the productive sectors of the economy and in the domestic households, and the inherent energy requirements. In both segments decisions have to be made with regard to the choice of fuel. In some cases, the decisions are reasonably predictable. For example, for households and industry, in most cases where gas is an option, the choice should inevitably point to gas. In other cases, notably in the power sector, the decision to switch to gas is not such a foregone conclusion.

The development of the aggregate additional demand for natural gas in Europe is a function of a range of interacting factors shaping the use of energy and gas in Europe's local markets. These include the considerations underlying the timing of replacement of old stock, local economic growth, fuel options and preferences of the consumers, or relevant gatekeepers, based not only on economic evaluations but also on additional factors, such as convenience, the outlook on an effective CO_2 -abatement policy, other (local) policies and the *security of supply* for specific fuels. These factors, in turn, are appreciated differently among the various types of consumers and for different local environments.

Figure 3.8 Composition of new energy demand from growth and substitution[411]



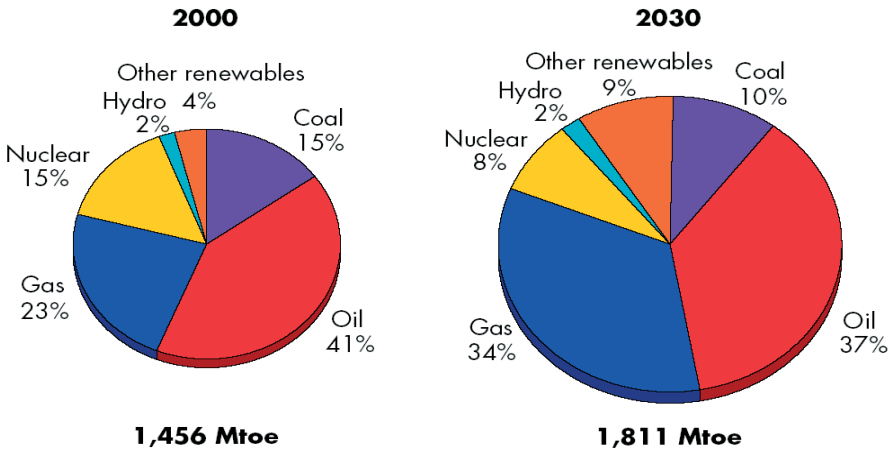
[411] CIEP, *Op. Cit*., 2003a, p. 12.

It is obvious that major uncertainty exist regarding the impact and the precise timing of all those specific factors affecting the development of future aggregate gas demand in the EU's regional fuel markets. Of course, this is generally recognised by planners and analysts when they make projections of future demand. However, what can be useful as a general planning tool for policy developments, cannot be regarded as a plausible and properly timed estimate for the EU's future local natural gas requirements. Particularly not when these estimates must be used as a basis for decision making for gas producers in Norway, Russia, Algeria and other potential sources. Those producers generally need to be assured of the sales of large incremental quantities of supplies, as investments in *dedicated* production and transmission capacities for specific regional markets are only economically feasible when realised on a large scale. Only detailed insights in the determinants of demand in a local market allow for an accurate evaluation of the 'security of demand', an essential element for the planning of the production and the size and routes of the supply systems, at the penalty of large economic losses. Also in the future, some sort of a way is needed to identify the size and pattern of demand for gas in all local sub-markets and to aggregate the individual 'orders', in such a way that a 'contractable' supply portfolio emerges, for which the buyer(s) can 'partner' with suppliers in the process of managing risks and uncertainties.

3.4.3 EU supply outlook

Increasing gas demand in the EU could imply that a high dependence on oil imports is replaced by a high dependence on both oil and gas imports, because Europe will not be able to supply sufficient gas from indigenous resources. Recently, the growing dependence on imports of fuels from outside Europe has gained attention again. This, however, has not yet translated in clear and consistent positions or policies across the European Union member states, as was made apparent in the several EU and IEA publications.[412] Per country, there is a wide variation in import-dependence of different fuels, thus it is not easy (or appropriate) to develop policies at the level of the EU. Moreover, the actual options available to reduce this dependence are limited.

Figure 3.9 Total primary energy demand in the European Union



Source: IEA, *World Energy Outlook*, 2002, p. 184.

[412] IEA, *Op. Cit.* 2001a; IEA, *Op. Cit.* , 2002; CEC, *Op. Cit.,* 2000.

Oil and oil products are still the most important fuel in the European energy market. For more than 20 years EU member states have actively sought to reduce their dependence on oil, to its current share of around 40% across the EU. With regard to security of supply, oil is a global commodity that can easily be transported and stored. Imports for the EU 15 plus Norway account for more than 50% of total oil consumption and this figure will increase further with falling indigenous production. The advantages of oil are clear. With an extensive infrastructure and low transportation and storage costs, it still provides the most convenient and price-competitive fuel for the automotive market. It is not likely, though, that oil products can regain ground in the residential heating market, while in the power generation sector the share of oil has been reduced for reasons of security, environmental concerns and price competitiveness. Altogether, the opportunity and justification for oil and oil products to take a bigger share of the future energy market seems limited so long as gas is available at competitive prices. It should be noted that taxation and levies are a crucial element in the prices of the several oil products.

Ambitious targets are set for **Renewable energy** in Europe's future energy portfolio, with a doubling of its share by 2010 from the current 6%.[413] With that increase, amounting to some 100 mtoe, it would be the relatively fastest growing source of energy, but it will fall short of meeting the growth of European energy demand. There is considerable political agreement on the desirability of promoting renewable sources of energy as part of the future fuel mix of Europe, as it contributes to two of the three pillars of energy policy, namely the *environment* and *security of supply*. However, given the current state of technology, the cost of renewable energy is still high and increasingly also environmental downsides of some of the preferred alternative fuels, like biomass, become more important. Tax incentives and subsidies are provided for the development of renewable options, sometimes funded by levies on other fuels. Such policies have their limits, however, as they are not sustainable and Europe aims to achieve low, competitive energy prices in the global market. In the absence of technological breakthroughs, renewable energy will be struggling to achieve those targets in the medium term.

Only twenty years ago, in response to the two oil price increases in the 1970's, the EU Council set a target to cover more than 70% of the EU electricity needs by means of nuclear energy and solid fuels. Sentiments have changed a lot for both forms of electricity generation: the accidents around nuclear power stations brought into focus the dimensions of the safety risks of this technology, while environmental concerns went against coal-fired power generation. Today, **nuclear power stations** installed in the EU provide 36% of the Communities electricity needs.[414] The future of nuclear energy in Europe remains uncertain, because the trade-off is complex. On the upside, nuclear energy contributes to security of supply and deals radically with one particular environmental concern, CO_2 emissions. On the downside, it is quite expensive relative to electricity from fossil fuels. Until the industry and the public come to grips with the safety risks (further brought into focus by the post-11/9 War on Terrorism) and the problem of long-term storage of waste, there appears not to be much chance for a significant comeback.

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[413] CEC, *Op. Cit.,* 2000, p. 42.

[414] IEA, *Electricity Information 2002*, Paris: OECD/IEA, 2002a.

Coal can only play a role in power generation. From a security of supply point of view, coal is an excellent performer. Notwithstanding the fact that virtually all new coal supplies will have to be imported from outside the EU, there is international trade with a choice of coal suppliers and a surplus of production capacity; supplies can originate from diversified sources and buyers can fairly easily switch between suppliers. New supplies can be developed at relatively low incremental costs. As a result the coal prices have shown more stability than oil prices. Nevertheless, the construction of new coal-fired power stations in Europe has slowed down substantially, because the advantage of coal only applies to existing plants. As stated before, it will be more expensive to build and operate new coal-fired than gas-fired power stations (under all but the most extreme price scenarios for gas and coal), even without taking a future carbon tax into account.

3.4.4 The availability of gas

Unless Europe radically changes its position on nuclear energy, increased dependence on fossil fuels imports will be a given for the foreseeable future. By 2030 Europe will need to arrange at least 70% of its energy requirements through imports of fossil fuels[415], if we assume that natural gas would become the preferred fuel for power generation. This would lead to a share of gas in the EU primary energy portfolio of close to 30% by 2020, but individual countries may show very different dependencies on natural gas.

This raises security questions that are often best addressed on a country-by-country basis, given the large differences per country in fuel mix and import dependence. The risks around this aspect of security of supply are dependent on diversity of fuels and supply sources and the political and technically security thereof. High dependence on fuel imports in itself does not need to pose insurmountable risks. Japan, as the second economy of the world, has managed to cope well with its very high dependence on imports and may provide some lessons on the consequences of import dependence. Over time it has developed and maintained strong economic and political ties with the countries on which it depends, always with an open eye to the interests of the supplying countries. Security and policy aspects require further analysis and attention. For gas specifically, the first question to be asked is whether the higher volumes needed to support the assumed growth in demand will be available at all. The answer is that, in principle, there is enough gas within economic reach of the EU to meet Europe's additional demand for energy for the foreseeable future. Indeed, generally the impression given is often that Europe has many potential suppliers of gas and that it thus does not need to worry about its future supply. European countries generally support the development of new indigenous sources and it is true that there are a number of countries interested in exporting their gas to Europe through pipelines, with Russia as the key provider and possibly a diversified portfolio of imports from the Caspian Sea area and/or Iran.

A second potential source of additional gas supply may come in the form of Liquefied Natural Gas (LNG). There is a lot of activity on the LNG front and, indeed, this could continue to help to supply a growing part of Europe's gas requirements, but because of limitations in scale LNG will not be able to satisfy more than a portion of future demand. The bulk of new gas supply will have to come through pipelines.

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415 IEA, CEC, *Op. Cit.,* 2002c; CEC, CEC, *Op. Cit.,* 2000.

These solutions, however, will probably never materialise if policy-makers in the consumer countries fail to accept the conditions necessary to bring this gas to the EU markets. The identification of the large gas fields in the Russia, the Caspian Sea region and the Persian Gulf, on the one hand, and the forecast for significant demand growth in Europe, on the other, are not sufficient conditions alone to bring the gas to the market. This is because fundamental differences exist between the exploitation of gas, oil and coal resources. Because there exists an international and mature market for oil (and, to a lesser extent, for coal), and transportation of oil is relatively cheap, oil producers can bring new fields into production, even from remote places, knowing that the fuels can always be sold somewhere, at the going price. The exploitation of remote natural gas resources, however, does not offer the assurance that a market can be found somewhere. It will be necessary to construct an expensive *dedicated* pipeline infrastructure from the remote fields to the market, which interconnects suppliers and consumers in a delicate relation of interdependence, also including transit agreements. The alternative to pipelines is a complex LNG chain, which is also characterised by very high investment costs for liquefaction, transportation and regasification. For both pipeline gas and LNG, the per-unit-of-energy cost of long-distance supply could be a factor 6-8 higher than that for oil.

4 EU enlargement

The imminent enlargement of the European Union will have a profound impact on Europe's energy supply situation. Most of the accession countries are considered to be in a state of transition and their energy production and consumption patterns are expected to change due to the implementation process of the EU *acquis*. This section aims to give an overview of some of the implications of EU enlargement, by focusing on the energy situations in the largest accession countries. Bulgaria and Romania are also included, even though these countries are not among the first group of accession countries, but their accession is expected in the medium term.

Application of EU *acquis*, including EU environmental legislation, and further continuation of their economic transition processes towards market economies is expected to have profound effects on the energy balance of the accession countries. Moreover, the coming enlargement will increase the energy import dependence of the European Union as a whole. Several of the accession countries are very dependent on a single imported source; Russian gas.

4.1 Current energy balances of East European countries

The economies of the formerly centrally planned economies of Eastern Europe were biased towards heavy industries, which resulted in high energy intensities. Because of intimate relations with Russia, through the COMECON organization[416], the Eastern European countries received ample oil supplies at low prices from the Soviet Union, while coal production in Hungary, the Czech Republic and Poland was also important (see table 6.4). After the dissolution of the COMECON, these countries were left with obsolete economies, whose energy sectors remained very dependent on state subsidies.

[416] COMECON or MEA: The Council for Mutual Assistance, organization that was set up in 1956 for the coordination of economic policy between the communist states of the Eastern bloc. COMECON was dissolved in 1991.

Table 4.1 Consumption per fuel type in Mtoe: the importance of coal

Country	Oil		Gas		Coal		Nuclear		Renew.		Total	
Poland	19,7	22%	10,1	12%	56,4	65%	0	0%	0,9	1%	87,1	100%
Hungary	6,4	27%	10,7	45%	3,3	14%	3,2	14%	N/A	N/A	23,6	100%
Czech Rep.	8,2	20%	8,0	19%	20,4	49%	4,2	10%	0,6	1%	41,5	100%
Slovakia	3,3	17%	6,9	36%	3,9	20%	4,1	21%	1,2	6%	19,4	100%
Lithuania	2,7	31%	2,6	30%	0,1	1%	3,2	37%	0,2	2%	8,7	100%
Bulgaria	4,2	22%	2,6	14%	6,8	36%	4,6	25%	0,5	3%	18,7	100%
Romania	10,9	28%	15,6	41%	6,9	18%	1,3	3%	3,6	9%	38,3	100%
Total	55,4	23%	56,5	24%	97,8	41%	20,6	9%	7,0	3%	237,3	100%

Source: BP, EIA. Data for 2002.

Poland, the Czech Republic and Hungary became members of the OECD in the mid-1990s, expressing their commitment to democracy and the market economy. Furthermore, Hungary and the Czech Republic are now member states of the International Energy Agency, which implies that they cooperate in the IEA crisis mechanisms to handle oil supply emergencies. The Slovak Republic and Poland are in the process of becoming IEA members. When these states become IEA members, they will be obliged to keep emergency oil stocks, equalling 90 days of net oil imports. Poland already has emergency oil stocks.[417] Of the countries in Eastern Europe, only Romania produces oil, but it still has to import half of its oil needs. Romania and Poland produce gas, but they are not self-sufficient.

4.2 Coal

Table 6.4 illustrates that coal continues to play an important role in the regions' primary energy mix, especially in Poland and the Czech Republic, the two biggest economies in the region. These two countries, good for over 63% of the combined GDP of the above-mentioned countries,[418] have extensive coal mining industries. They also export coal. During the last decade, the mining industries in both countries have been restructured, resulting in the closure of unprofitable mines and in a reduction of the workforce employed in the coal mining industry. This has resulted in a decline in output for both countries.[419] Because of an accompanying decline in consumption, both countries remain coal exporters.

In the Green Paper, a bleak outlook for the Polish coal industry is painted. Due to international competition and geological conditions, the Commission assumes that the Polish coalmines will loose their profitability in the near future. To maintain coal production, the state would have to subsidize the sector and create a situation like in Germany. The Polish government last year proposed a new rationalisation of the industry, in which the total workforce would be reduced to 100.000 and export subsidies would be abolished.[420] The fate of the Polish mining industry is not necessarily that of Germany. Technological inno-

[417] IEA, *Monthly Oil Survey*, April 2003, p. 24.

[418] Poland's GDP is $190 billion, the Czech Republic's GDP is $68 billion, while that for the other countries in table 6.4 combined is US150 billion. Source: EIA, 2001 figures.

[419] Bell, I. (ed), *Regional Surveys of the World: Central and South-East Europe*, London: Europa Publications, 2003, pp. 220, 446.

vations, together with industry-wide acceptance of changes, can create the necessary preconditions under which a profitable Polish mining industry could survive.[421] This would imply, however, that the efficiency must increase substantially.[422] The Czech Republic is pursuing a privatization programme for its coal mining industry.[423] The production of domestic coal can be important to manage the import dependency on oil and gas.

4.3 Natural gas

The existing gas infrastructure in the majority of the accession countries firmly links into the Russian pipeline grid, providing Russia with a dominant position on their gas markets. Russia provides between 74% and 100% of all gas imports of these countries. Geographical conditions and the existence of the Russian-dominated natural gas pipeline grid effectively rule out a future role for LNG in Poland, Hungary, the Czech Republic and Slovakia. In addition, Poland, Slovakia and the Czech Republic are important transit countries for Russian natural gas moving towards customers in Western Europe. These transits are expected to grow in volume in the near future.[424] Analogous to projections of future EU-15 gas consumption, domestic consumption of natural gas in the accession countries is expected to grow, as a result of economic development and a change of the energy mix of these countries.[425] At present, natural gas provides about 25% of the primary energy consumption of these countries.

Accession to the EU, including implementation of the EU *acquis communautaire*, is likely to have a profound medium term impact on the composition of the primary energy mix of the accession countries. The share of natural gas is predicted to grow. Environmental regulations promote the consumption of natural gas to the detriment of more polluting primary energy carriers such as coal.[426] The Proposal for a European Parliament and Council Directive concerning the security of natural gas supply measures (COM 2002 488 final) would require the accession states to hold emergency stocks of gas.[427] Such a scheme could technically contribute to EU security of gas supply, but the dependence on a single supplier of the accession countries reduces the usefulness of strategic gas reserves, while constituting a high cost on these economies.

The Directives on natural gas markets (98/30/EC and 2003/55/EC) aim to create a competitive internal natural gas market in the European Union. For the accession states, it means breaking with existing practises, but with their heavy reliance on a single supplier, competition will be limited. State owned natural gas companies are to be unbundled, and natural gas markets must be opened for competition. It stands to be seen how these developments will affect existing long-term supply contracts. Opening of the gas sector to competition, one of the obligations for EU membership, has not yet been completed, with dif-

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420 IEA, *International Energy Outlook 2003*, p. 86.

421 E.g., International Longwall News, "Polish mine sets new record", October 21, 2002, http://www.jcoal.or.jp

422 CEC, *Op. Cit.*, 2001, p. 35.

423 Financial Times, "Czech brown-coal assets to be sold off", July 28, 2003.

424 CEC, *Op. Cit.*, 2001, p. 41.

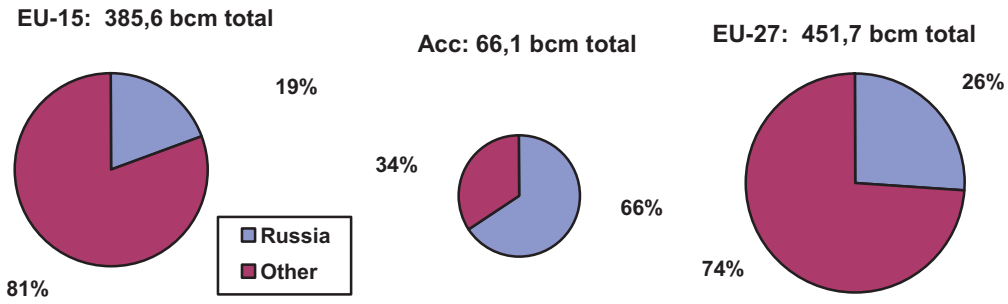
425 For a critical analysis of the assumptions that underlie these projections, see CIEP, *Op. Cit.*, 2003a.

426 Again, refer to CIEP, *Op. Cit.*, 2003, pp. 18-21.

427 EU, http://europa.eu.int/scadplus/leg/en/lvb/l27047.htm

ferent countries on different stages of transition.[428] In a bid to diversify its imports, Poland has committed itself to buy limited volumes of Danish and Norwegian gas, next to existing, if downscaled, Russian contracts.[429] Norway could also become a supplier for the Baltic countries. However, in most cases the ability to diversify is seriously limited by economic conditions. Latvia possesses Europe's third largest natural gas storage facility. Current capacity stands at 141 BCF, equalling over two and a half year of Latvian natural gas consumption. [430]

Figure 4.1 Share of Russian gas in Europe's gas consumption 2002



Sources: BP Statistical review of World Energy, 2003.

4.4 Oil

Like natural gas, the accession countries, including Romania and Bulgaria, are dependent on imports of crude oil to satisfy their demand. In the COMECON years, the Soviet Union served as their source of cheap oil supplies. Existing infrastructure gives Russia a dominant position on the regional oil market, with exports reaching Poland, Hungary, the Czech Republic and Slovakia via the Friendship (Druzhba) pipeline. The Czech Republic can also import oil via Western Europe, while Poland has an oil terminal in Gdansk, implying that Russia does not have a monopoly position on the regional oil market.[431] This pipeline is further used to export crude oil to Germany.

Romania and Bulgaria are also dependent on oil imports. Despite Romania's limited crude oil production level, the country has a large oil refinery sector based on the previous division of labour in the COMECON. Because of low demand and maintenance arrears, most of these run well below maximum capacity.[432] With their Black Sea coast, imports from different producers are available, namely

[428] Petroleum Economist, July 2003, p. 17; Commission Report 2002 Slovakia, Chapter 14; Commission Report 2002 Estonia, Chapter 14, Commission Report 2002 Hungary, Chapter 14; Commission Report 2002 Bulgaria, Chapter 14; Commission Report 2002 Romania, Chapter 14; Commission Report 2002 Czech Republic, Chapter 14; Commission Report 2002 Poland, Chapter 14.

[429] Source: EIA, *Poland Country Analysis Brief*, 2003, http://www.eia.doe.gov/emeu/cabs/poland.html

[430] Source: EIA, *Baltic Sea Region Country Analysis Brief*, 2002, http://www.eia.doe.gov/emeu/cabs/baltics.html

[431] Source: EIA, 2003, http://www.eia.doe.gov/emeu/cabs/visegrad.html

[432] EIA, *Southeastern Europe Country Analysis Brief*, 2002.

Azerbaijan, Kazakhstan and Russia. Bulgaria could also serve as a transit route for Caspian oil, perhaps as a bypass for the overcrowded Bosporus Straits. A pipeline, either to Thessaloniki in Greece, Vlore in Albania or a pipeline from Romania towards Trieste in Italy would facilitate such a bypass. Feasibility studies for all pipelines have been conducted, but construction has not started.[433]

Russian oil exports transits the Baltic States. The construction of a new export terminal in Primorsk, near St. Petersburg, in Russia could reduce this oil transit. Transit fees for oil constitute an important source of revenues for the Baltic States. The current export capacity of the Primorsk terminal is 240,000 b/d, which will be upgraded to 600-840,000 bbl/d by 2005.[434] Current transit volumes in the Baltic States are more than 300,000 b/d.[435] This volume would be greater but a disagreement with the Russian pipeline monopolist Transneft has currently reduced exports through the Lithuanian port of Ventspils.[436] Because of the construction of the Baltic Pipeline System, an additional 310,000 barrels of oil from Kazakhstan is now exported via the Baltic States.[437] An expansion of the Primorsk terminal export capacity in the near future will limit the transit fees for the Baltic States, but as some exports will continue to pass through their territories, their oil supply situation remains certain.

The accession countries will join in the EU stockholding programme, while IEA member states Hungary, the Czech Republic, and Poland will also take part in the IEA's emergency stockholding programme. Every enlargement of the amount of oil accumulated for use in emergency situations will prove valuable in case of an emergency. However, with the accession countries consuming less than 10% of the amount of oil consumed by the EU-15, the effects of this increase in strategic stocks may prove limited.[438]

4.5 Conclusion

World oil and gas demand will continue to grow in the coming decades. Demand for gas will grow at a faster rate than demand for oil. World oil and gas reserves are sufficiently large to potentially satisfy this increasing demand. The availability of oil and gas for exports will depend largely on investments in new capacity and the security of demand that consumer countries can offer for these large investment projects. It is clear, however, that the increased import dependency on only a few major oil and gas exporting countries will challenge the security of supply of the major consumer countries, including the EU, and that the risk of tensions among producers and consumers and among consumers could increase if there are no adequate ways to defuse these tensions and insecurities.

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433 EIA, *Southeastern Europe Country Analysis Brief*, 2002.

434 Petroleum Intelligence Weekly, Vol. 42, no. 8, February 24, 2003, p. 9.

435 Petroleum Intelligence Weekly, Vol. 42, no. 10, March 10, 2003, p. 9.

436 Global Pipeline Monthly, Vol. 1, no. 1, 2003, p. 62; Petroleum Intelligence Weekly, Vol. 42, no. 11, March 17, 2003, p. 7.

437 Hansen, S., *Pipeline Politics; the Struggle for Control of the Eurasian Energy Resources*, The Hague: CIEP, 2003, p. 62; EIA, *Caspian Sea Region: Reserves and Pipeline Tables*, 2002.

438 EU-15 consumes 13,4 mb/d, the accession countries 1,2 mb/d. Source: BP.

Annex 5

Terms of Reference

Terms of Reference

B-Brussels: study on energy supply security and geopolitics
2002/S 127-098700
Contract notice

Services

Is this contract covered by the Government Procurement Agreement (GPA)? Yes

{PRIVATE} **Section I: Contracting authority**

I. 1) **Official name and address of the contracting authority:** European Commission, Directorate-General for Energy and Transport, Att: Mr Ioannis Samouilidis , rue de Mot 24 6/125, B- 1049 Bruxelles/Brussel. Tel.: (32-2) 295 09 67. Fax: (32-2) 296 58 01. E-mail: Ioannis.Samouilidis@cec.eu.int.
URL: http://europa.eu.int/comm/dgs/energy_transport/index_fr.html.

2) **Address from which further information can be obtained:** Commission of the EU, for the attention of Ioannis Samouilidis, 24, rue de Mot, B-1040 Bruxelles/Brussel. Tel.: (32-2) 295 09 67. Fax: (32-2) 296 58 01. E-mail: Ioannis.Samouilidis@cec.eu.int.

3) **Address from which documentation may be obtained:** As in I.1).

4) **Address to which tenders/requests to participate must be sent:** As in I.1).

5) **Type of contracting authority:** EU institution.

{PRIVATE} **Section II: Object of the contract**

II. 1) **Description**

1.1) **Type of works contract (in case of works contract):**

1.2) **Type of supplies contract (in case of supplies contract)**

1.3) **Type of service contract (in case of service contract):** Service category 11.

1.4) **Is it a framework agreement?** No.

1.5) **Title attributed to the contract by the contracting authority:** 'Study on Energy Supply Security and geopolitics'.

1.6) **Description/object of the contract:** The following issues will need to be considered specifically by the consultant.

1. The relationship between energy security and worldwide geopolitical developments.
2. International cooperation of the EU with other nations and economic blocks.
3. Effects of EU enlargement.
4. Implications of the euro.
5. Investment for hydrocarbon exploration and production in the producing countries; investment climate.
6. Energy geopolitics and the environment.
7. The interaction between globalisation, liberalisation and geopolitical developments.
8. Impact of terrorism on sensitive areas and infrastructures.
9. Impact of the energy price shocks on the EU economy.

1 0. Scenario Analysis - Conclusions of the study.

1.7) **Site or location of works, place of delivery or performance:** The contracting party will perform the tasks he is to carry out on his own premises.

1.8) **Nomenclature**

1.8.1) **Common Procurement Vocabulary (CPV):**

1.8.2) **Other relevant nomenclature (CPA/NACE/CPC):** 865/866.
1.9) **Division into lots:** No.
1.10) **Will variants be accepted (where applicable):** No.
2) **Quantity or scope of the contract**
2.1) **Total quantity or scope (including all lots and options, if applicable):** The total esti mated amount for the study is 100 000 EUR.
2.2) **Options (if applicable). Description and time when they may be exercised (if possi ble)**
3) **Duration of the contract or time limit for completion:** Period in month/s: 9 from the award of the contract.

{PRIVATE} **Section III: Legal, economic, financial and technical information**

III. 1) **Conditions relating to the contract**
1.1) **Deposits and guarantees required:** The successful tenderer may be requested to pro vide a deposit or a bank guarantee.
1.2) **Main terms of financing and payment and/or reference to the relevant provisions:** Terms of payment figure in the tender documents and are those which are in force for service contracts at the European Commission.
1.3) **Legal form to be taken by the grouping of suppliers, contractors or service providers to whom the contract is awarded:** Groupings, irrespective of their legal form, may submit bids. Tenderers may, after forming a grouping, submit a joint bid on condition that it complies with the rules of competition. Such groupings (or consortia) must specify the company or person heading the project and must also submit a copy of the document authorizing this company or person to submit a bid or to sign a contract on behalf of the grouping/consortium.
2) **Conditions for participation**
2.1) **Information concerning the personal situation of the contractor, supplier or serv- ice provider and information and formalities necessary for the evaluation of the minimum economic, financial and technical capacity required:**
2.1.1) **Legal position - means of proof required:** Tenderers should be individuals or legal entities. If tenderers are natural persons, they must provide proof that they are covered by a social security scheme as a self-employed person.
2.1.2) **Economic and financial capacity - means of proof required:** Balance sheets or extracts from balance sheets for the last three financial years; a statement of overall turnover and turnover relating to the relevant services for the last three financial years.
2.1.3) **Technical capacity - means of proof required:** Prior solid experience in similar geopo- litical studies should be ascertained.
List of previous work for the last three years should be submitted.
3) **Conditions specific to services contracts**
3.1) **Is provision of the service reserved to a specific profession?** No.
3.2) **Will legal entities be required to state the names and professional qualifications of the personnel responsible for execution of the contract?** Yes.

{PRIVATE} **Section IV: Procedure**

IV. 1) **Type of procedure:** Open.

1.1) **Have candidates already been selected?** No.

1.2) **Justification for the choice of accelerated procedure (if applicable):**

1.3) **Previous publication concerning the same contract (if applicable):**

1.3.1) **Prior information notice concerning the same contract:** Notice number in OJ content list: 2002/S 089-069710 of 8.5.2002.

1.3.2) **Other previous publications:** None.

1.4) **Envisaged number of suppliers which will be invited to tender (when applicable):**

2) **Award criteria:** The most economically advantageous tender in terms of criteria as stated in contract documents.

3) **Administrative information**

3.1) **Reference number attributed to the file by the contracting authority:**

3.2) **Conditions for obtaining contract document and additional documents:** Obtainable until: 31.7.2002.
Price: free of charge.

3.3) **Time-limit for receipt of tenders or requests to participate (depending whether it is an open, restricted or negotiated procedure):** 12.8.2002.
Time: 16.00 (Brussels time).

3.4) **Dispatch of invitations to tender to selected candidates (in restricted and negotiated procedure):** Not applicable.

3.5) **Language or languages in which tenders or requests to participate can be drawn up:** Spanish, Danish, German, Greek, English, French, Italian, Dutch, Portuguese, Finnish, Swedish.

3.6) **Minimum time frame during which the tenderer must maintain its tender (in case of an open procedure):** 6 months from the deadline stated for receipt of tenders.

3.7) **Conditions for opening tenders**

3.7.1) **Persons authorized to be present at the opening of tenders:** A representative of each tenderer may attend the official opening session.

3.7.2) **Date, time and place:** Date: 21.8.2002. Time: 12.00.
Place: 28 Rue de Mot (ground floor, office 91) Mail/Archives service, B-1040 Brussels.

{PRIVATE} **Section VI: Other information**

VI. 1) **Is this notice a non-mandatory one?** No.

2) **If applicable, indicate whether this procurement is a recurrent one and the estimated timing for further notices to be published**

3) **Does the contract relate to a project/programme financed by EU funds?** No.

4) **Additional information (if applicable):**

5) **Date of dispatch of this notice:** 21.6.2002.