

Tomorrow's Mores

The International System, Geopolitical Changes and Energy

Femke Hoogeveen | Wilbur Perlot (Eds.)

Clingendael International Energy Programme



Nederlands Instituut voor Internationale Betrekkingen
Netherlands Institute of International Relations
Clingendael

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December 2005

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Preface

The international energy markets are undergoing substantial changes which are partly due to increasing imports from OECD countries and the emerging economies in Asia. Developments in supply and new preferences of major consuming countries in their energy mix are also major drivers for the market change. In international oil markets a concentration of supply will emerge in the next decade, when non-OPEC supplies are expected to peak. This will imply a growing call for OPEC supplies. In international gas markets, LNG is expected to link the Asian, European and North American markets in a world market for gas. Again, most of the new supplies must come from a small group of producing countries. The reduction of GHG emissions that is part of many consumer countries' energy policies will stimulate a move away from coal, unless the price of competitive energies increases to a level that allows clean coal technologies to compete. The renewed interest in nuclear energy can also be explained by the consumer countries' environmental and security of supply concerns. The efforts to introduce renewable energy sources will be stepped up, not only for environmental reasons, but increasingly also for reasons of security of supply.

These many changes in the energy scene cannot be separated from the developments in the international political and economic system. The geopolitical context in which new energy flows must be generated for old and new destinations is an important determinant for the manner in which these flows will come about. Only fifteen years ago, many OECD countries assumed that the new energy relations would be shaped by intensified globalisation. Today, there is less certainty about the structure of international political and economic relations in general, and the structure of energy relations in particular. Energy has again become part of the strategic political interests of producer and consumer countries alike. Uncertainty about supply and demand have not only created uncertainty about investment requirements, but have also allowed for the reintroduction of power politics into the energy agenda.

In this study, *Tomorrow's Mores; the International System, Geopolitical Changes and Energy* the future international system is explored as an important context for future energy relations. This study was conducted for the joint commission *Energy and Foreign Policy* of the advisory councils of the Netherlands Ministries of Foreign and Economic Affairs, and builds on earlier work done by the Clingendael International Energy Programme. This includes, among others, a study for the European Commission, *Energy Supply Security and Geopolitics* (CIEP, The Hague, January 2004) and *Energy Security in a Changing World* (Coby van der Linde, in: *Managing Strategic Surprise*, P. Bracken, I. Bremmer, D. Gordon eds., Eurasia Group, September 2005). In the present work of Femke Hoogeveen and Wilbur Perlot, the geopolitical context of possible future energy relations is explored against the background of wider shifts in international relations.

In the course of this study, various people have made contributions and comments. Gert de Nooy of the Clingendael Security and Conflict Programme (CSCP) contributed his knowledge on sea-borne security issues. Erik Janssen, Christoph Tönjes, and Jacques de Jong contributed their particular areas of expertise and helped shape this study.

The responsibility for the content of this study lies entirely with the Clingendael International Energy Programme.

Coby van der Linde
December 2005

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List of Abbreviations

APEC	Asia-Pacific Economic Cooperation
APPCDC	Asia Pacific Partnership on Clean Development and Climate
b/d	barrel of 159 litre of oil (product) per day
BASREC	Baltic Sea Region Energy Co-operation
Bcf	Billion cubic feet
Bcm	Billion cubic meter
BTC	Baku-Tblisi-Ceyhan (oil pipeline)
CCGT	Combined Cycle Gas Turbine
CDM	Clean Development Mechanism
CIEP	Clingendael International Energy Programme
COMECON	Council for Mutual Economic Cooperation
CO ₂	Carbon Dioxide
COP	Conference of the Parties (of the Kyoto Protocol)
ECS	Energy Charter Secretariat
ECT	Energy Charter Treaty
EIA	Energy Information Administration
EMP	Euro-Mediterranean Partnership (Euromed Partnership)
Et al.	Et alii
ETS	Emission Trading Scheme
EU	European Union
Eurostat	European Statistics Agency
FDI	Foreign Direct Investment
FSU	Former Soviet Union
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GHG	Greenhouse Gas
GDP	Gross Domestic Product
GtL	Gas to Liquid
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
IEF	International Energy Forum
IEFS	International Energy Forum Secretariat
IEP	International Energy Programme
Ibid.	Ibidem
IMF	International Monetary Fund
IOC	International Oil Company
IPE	International Petroleum Exchange
JI	Joint Implementation
JODI	Joint Oil Data Initiative
IR	International Relations
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
Mb	Million barrels

Mb/d	Million barrels per day
MDG	United Nations Millennium Development Goals
MENA	Middle East and North-Africa
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
NO _x	Nitrogen oxides
NOC	National Oil Company
OAPEC	Organization of Arab Petroleum Exporting Countries
OECD	Organization for Economic Cooperation and Development
OLADE	Latin American Energy Organization
OPEC	Organization of the Petroleum Exporting Countries
OSCE	Organization for Security and Cooperation in Europe
PdVSA	Petróleos de Venezuela
PPM	Parts per million
SCO	Shanghai Cooperation Organization
SO _x	Sulphur oxides
Tcf	Trillion cubic feet
TOP	Take or Pay
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
UNFCCC	United Nations Framework Convention on Climate Change
UNSC	United Nations Security Council
UNSD	United Nations Statistics Division
US	United States of America
USD	United States Dollar
WB	World Bank
WEO	World Energy Outlook
WTO	World Trade Organization
WWII	Second World War

1

Introduction

1.1. Problem definition: Geopolitical changes and energy

In 2000 the European Commission launched its Green Paper *Towards a European strategy for the security of energy supply*.¹ In many ways this timely publication can be seen as surprising. At the time, policies of the EU and Member States had been oriented towards optimising the internal energy market. Part of the idea was to decrease the costs of energy for end-users by increasing cost-efficiency through liberalisation. The low oil prices, environmental concerns and the expectations about the world system in the 1990s in Europe and the US after the demise of the Soviet Union, had pushed security of energy supplies largely off of the political agenda. The focus of the Green Paper was on the increasing import dependency of the EU for oil and natural gas (over 80 percent of these two fossil fuels were expected to be imported by 2030).² At that moment it could not be foreseen that the importance of energy security would become so visible so soon.

Since 2004, an unexpected high demand increase from China, the US and, to a lesser extent, India has led to a very tight oil market, which is shifting from a buyers' market to a sellers' market. The production capacity for crude oil has always been larger than the demand. Crises were caused by supply shocks.³ The high prices that began increasing in 2003 find their origin in a demand shock, in which supply had great difficulty to stay ahead of demand. The result is a market in which every producer, no matter how small, is of significance. Strikes in Norway, political tension in Venezuela, rebel groups in Nigeria, non-proliferation issues with Iran, the death of King Fahd in Saudi-Arabia, civil war in Sudan, problems around Yukos in Russia, tropical storms in Gulf of Mexico and the continued unrest in Iraq - all of these unrelated events have led to higher oil prices and are directly felt by governments, businesses and households across the world. The availability of energy at reasonable prices suddenly has become a major issue again, in a way not seen since the early 1980s.

The rising demand from China and India comes at a time that the energy flows have already significantly changed since the demise of the Soviet Union. Increasingly, European countries count on Russia for their energy supplies, reducing their dependency upon the Persian Gulf. Persian Gulf oil is destined more and more for Asia. The increasing mutual dependency between the countries around the Persian Gulf and the important Asian consumers is a trend only strengthened by the robust rates of demand growth of the past few years. As a matter of fact, Asian countries are now the most important customers of oil from the region.⁴ Moreover, the significant change in oil flows impacts the soft power of consumer countries in the oil market and towards producing countries.

As a consequence of the current market situation and the predictions of future energy demand, the EU is only one of the consuming regions with higher demand for imported oil and gas. Asian and American oil and gas demand is growing at a faster rate than Europe's. These growing imports have to come from an increasingly smaller number of sometimes politically unstable net exporting countries. Although the massive oil revenues of the past two years have eased the immediate economic pains that were so evident only six years ago when, in the wake of the Asian crisis, oil prices reached their lowest levels since 1973, the

¹ European Commission, *Towards a European strategy for the security of energy supply*, Brussels, COM 769 final, 2001.

² *Ibid.*, p. 22-23.

³ Most notably during the two oil crises in 1973 and 1979.

⁴ In 2004, roughly 60% of Persian Gulf oil production was exported to Asia. BP, *Statistical Review of World Energy 2005*.

need for fundamental social, political and economic reform remains evident.⁵ The events of 9/11 and the subsequent “War on Terror” have only underpinned the need for reform at both national and international levels. At the same time, the decision of the US to intervene in Iraq and some of the rhetoric of the Bush Administration during its first term have made the government elites and populations of the exporting countries suspicious of the call for democratic reform as being a disguised way to obtain control over their countries and the countries’ oil resources.

The closer ties with Asia could be a credible alternative for the dependency of producers upon western consumers. So far Asian countries have not tied purchasing oil and gas and making investments in the oil and gas sector in producer countries to political demands. It is even the other way around: Asian investments come with increased governmental support from consumers to producers, including political support and development aid packages.

Political manoeuvring on the part of the emerging Asian economies has to some extent already alarmed Europe and the US. These two consumer blocks have always relied heavily upon the international market to secure their energy supply. The limited access to reserves and production capacity of international oil companies, combined with the new competition from Chinese and Indian companies that do not primarily have a profit motive but that, with support from their governments, invest to secure flows to their home markets, fuels concerns about increased political competition for oil and gas resources between the major consumer countries.

The nature of this competition is largely determined by the broader international system. The concern for energy security comes at a time that the international system is in its biggest state of flux since the Second World War.⁶ A push for intensified globalisation, emerging powers in Asia, transatlantic divisions, a politically volatile Middle East, differences between EU Member States, an assertive US foreign policy, marginalisation of the UN and a growing perception of insecurity including the threat of terrorism, the very magnitude and speed of change and the uncertainties that go with it will all be defining features of the world for many years to come.⁷

The changing geopolitical landscape and the growing energy needs funnel energy away from economic policy and into the realms of foreign and security policy.⁸ The Dutch government is considering energy as an objective of Dutch foreign policy and has asked two advisory councils to advise them on including energy as a priority in Dutch foreign policy and which foreign policy instruments could best serve the Dutch security of supply.⁹ It is in this context that the commission preparing the advice on energy and foreign policy has requested the Clingendael International Energy Programme (CIEP) to analyse the geopolitical developments in relation to energy relations and provide an outlook on expected trends and possible scenarios for the international system, the EU and energy markets in particular.

1.2. Objectives of the study

The objective of this study is to provide an analysis of key geopolitical changes in the international system, with particular attention for energy issues and the EU, and on the basis of this analysis define possible energy futures up until 2020.

To be able to successfully reach the main objective of this study, four sub-objectives have been identified. *First, to understand the international system and the main actors shaping it.* The international system is

⁵ See for example: UNDP, *Arab Human Development Report*, 2002, 2003 and 2004, <http://www.rbas.undp.org>.

⁶ National Intelligence Council, *Mapping the Global Future*, Report of the National Intelligence Council's 2020 Project, Pittsburgh, Government Printing Office, December 2004, p. 9.

⁷ Ibid.

⁸ See also the CIEP study conducted for DG TREN of the European Commission: CIEP, *Study on Energy Supply Security and Geopolitics*, The Hague, 2004, <http://www.clingendael.nl/ciep>.

⁹ The Dutch General Energy Council (AER) and the Dutch Advisory Council on International Issues (AIV).

not a given, it is daily constructed and reconstructed by actions of actors and the interpretations of these actions by other actors. Although the actions of non-state actors have increased in importance through the nineties, this is still a world in which national policies and domestic economies are the principal determinants of economic relations.¹⁰ This is perhaps most true for policy regarding energy carriers, since these remain a strategic and even military commodity directly linked to national interests. In this study nation states, in particular the main energy consumer and producing countries, are seen as the most important actors.

To analyse the position and direction of actors in the international system, CIEP has developed a quadrants model based on two variables of uncertainty that determine the makeup of the international system. The first indicates whether the world is headed towards increased multilateralism and global governance or towards more bilateralism, outside global governance institutions. The second indicates whether the world is characterised by political-strategic (state-driven) orientation or by an economic (market-based) orientation.

Secondly, to understand an actor's energy policy and how energy policy is determined. Energy policy is more than energy security. It is possible to identify three main objectives of energy policy: energy must be available, affordable and clean. The importance that is attached to each of the separate goals and the choice for certain policy instruments varies among countries and through time. In general this makes it difficult to reach all three main objectives at the same time. The priorities of energy policy are dependent upon a range of external factors such as culture, history, economic development, indigenous energy sources, social and political situations, influence of companies, influence of Non-Governmental Organisations (NGOs), etc. The internal priorities in energy policy and these external factors together constitute an actor's room to manoeuvre. The process of energy policy-making is delimited by this room to manoeuvre. In this study this is referred to as the 'policy space' of an actor. When discussing possible futures and trends for actors it is important that these futures fit the policy space. If not, such a future becomes highly unlikely and irrelevant to this study. The current report will not give a full overview of the energy policy and policy space per actor. However, it does provide a comprehensive theoretical and analytical framework to understand energy policy making in a changing geopolitical context.

Thirdly, to identify the most important developments within the energy system. The study gives an overview which is used to identify the full chain from the production of energy carriers to actual consumption of energy by different end-users. It is not the intention to give a full overview, but for the purpose of this study it has been important to know, for example, whether in the next fifteen years a renewable energy source will be a true competitor to oil and thus turn out to be game changer in terms of geopolitics and competition for oil. The overview is also important to indicate possible areas which deserve attention in foreign relations and diplomacy. Separate attention is given to global warming and energy poverty reduction.

Fourthly, to understand the EU's position in the changing geopolitical landscape. The study focuses on EU energy policy and to a certain extent the lack thereof. More importantly, the study looks at the implications for the EU of the changes in the geopolitical landscape. The current dynamics within the Union and the differences between the most important Member States in policy space and the two variables of uncertainty are taken into account when discussing the future role and position of the Union and the opportunities and threats for EU energy security.¹¹

1.3. Outline of the study

¹⁰ Gilpin, R., *Global Political Economy; Understanding the International Economic Order*, Princeton, Princeton University Press, 2001. p. 3.

¹¹ See also CIEP, *Study on Energy Supply Security and Geopolitics*.

Chapter 2 describes the theoretical and analytical framework used for the study. In this chapter important theoretical notions and assumptions are explained. It starts with a quadrants model combining two axes of uncertainty (multilateral – uni/bilateral and politics – economy). It continues with the foundation – consisting of key factors of analysis and assumptions about an actor’s energy policy – underlying the analysis and the positioning of actors in the quadrants. It also contains a section on scenario studies.

Chapter 3 provides an overview of the developments in the energy sector, with a focus on challenges, risks and problems with relevance to foreign policy and geopolitics. The chapter is based on the information on energy carriers, EU energy policy and important energy issues that is discussed in further detail in Annex A, B and C, respectively.

Chapter 4 analyses the geopolitical landscape, starting with a description of the international system prior to 1989. It contains an analysis of the present situation and presents three possible energy futures towards 2020. Past, present and future are analysed on the basis of the quadrants model. The chapter includes a description of the most important actors.

In Chapter 5 the analysis of chapter 4 is used to look at the case of the European Union. The current place and role of the EU is discussed. The implications for the EU of a shifting balance in geopolitics are examined per future. It is argued that the policy space of an EU consisting of 25 member states or more leaves little room for strategic choices. The possibilities for the EU to prepare itself for at least two of the three futures are limited as long as the Member States are unable to make the EU more than the sum of its parts.

Chapter 6 concludes. It reflects on the most important developments in the international energy market and the geopolitical changes presented in this study.

2

Analysing the international system, geopolitical changes and energy

2.1. Point of departure: The Study on Energy Supply Security and Geopolitics

The Clingendael International Energy Programme conducted a study on energy supply security and geopolitics for the Directorate-General Transport and Energy of the European Commission which was published in 2004.¹ The study forms the point of departure for the current report and is highly recommended as a comprehensive overview on energy supply security. Focussing on policy options, it looks at the problematic situation in most producer countries leading to political and social instability and possible supply disruptions. The instability is also placed in a more overall geopolitical and economic setting for which two storylines were developed, as the best and worst case scenarios for the EU.

The first storyline is called 'Markets and Institutions'. This path recognises a deepened globalisation process, in which more and more countries become integrated in the global market. International relations see a continued evolution of the multilateral system, including the many supranational and economic institutions. Conflicts and disputes between states are settled by these institutions. Open hostilities between nations are rare. Competition for energy resources is channelled through the market.²

In the second storyline, 'Regions and Empires', economic integration does not continue so much on a global level, but rather regionally, between so-called empires and connected countries. Competition for energy resources takes place through strategic manoeuvring that attempts to bind certain producer countries to the empire. International relations are dominated by unilateralism/bilateralism.³

The current report takes the two storylines back to the drawing board. To continue the analysis of geopolitics and energy, this study introduces a model that makes it possible to analyse actors' policy spaces within the context of changing geopolitics. This chapter presents the methodology of the study (section 2.3), the analytical model (section 2.4) and the theoretical assumptions used in this study (section 2.5 and 2.6). It starts with an outline of the basic guiding theoretical considerations.

2.2. Basic theoretical considerations

The term geopolitics has various meanings.⁴ In this study geopolitics is referred to as superpower rivalry, in this case over the control of energy resources. Superpower rivalry takes place within and at the same time influences the *international political and economic system*, which is shaped by national, inter-governmental, intra-governmental and non-governmental institutions and organisations, such as states, international organisations, (multinational) companies, armed forces, terrorist groups, but also peace movements, human rights activists, and environmental organisations.

The primary actors within the international political arena are sovereign nation states. Actors can be rule setters or rule followers. Rule setters determine the mores that dominate the international system and to which rule followers either willingly or unwillingly adhere. The role of non-governmental organisations,

¹ CIEP, *Study on Energy Supply Security and Geopolitics*.

² *Ibid.*, pp. 81-107.

³ *Ibid.*

⁴ Amineh, M.P., *Globalisation, geopolitics and energy security in Central Eurasia and the Caspian Region*, The Hague, CIEP/ Clingendael, 2003.

companies and regional governments is considered to be important primarily in shaping policies at the national level and regard their influence at the international level as indirect.⁵ The role of international and supra-national organisations is treated the same way, as their authority only exists when allowed by nation states. In the case of energy, delegated competences are few. In this study, we focus primarily on the role of governments and therefore do not separately analyse the role and influence of other actors on government policies.⁶

This does not deny their importance. State behaviour at the international level is for a large part *the sum of forces at play within the domestic arena and shapes the policy space of an actor* (see section 2.5 and 2.6). It is the result of interests, ideals, identity, social and political circumstances, combined with cultural perspectives and historical experiences.⁷ “Political and economic identities or ideologies can have a strong influence on national behaviour. Certainly, one can not explain the Cold War without reference to the ideological conflict between the democratic-capitalist identity of the United States and the totalitarian-communist identity of the Soviet Union.”⁸ In reality, interests and identity/ideology do not necessarily match. Large actors might establish the rules that other actors - whether they be other countries, companies, NGOs or supra-national organisations - have to adhere to, and in general these rules reflect both interests and identity.⁹ For smaller actors this might mean making choices.

Another way of describing the discrepancy between interests and identity is by looking at the roots of behaviour and the decision-making of policy makers.¹⁰ In theory, the many problems in the energy sector are solvable and manageable. In practice, however, policy makers experience the limits of their problem-solving capacity. Policy-makers act from *bounded rationality* and rational ignorance.¹¹ The rational, purely wealth-maximising behaviour of countries is limited to a great extent by limited foresight, incomplete information, cultural and/or national identities and sets of incomplete subjective perceptions that steer behaviour and decision-making processes.¹² All actors within the international community are subject to incomplete subjective perceptions. Such perceptions and culturally bounded rationality are important in assessing how the international system will develop. To a certain extent actors do not react to one another on the basis of actual situations and ‘reality’, but on the basis of perceived reality.

The present study adopts an integrated approach to international relations. It incorporates in the analysis the local determinants of the foreign policies and international relations of countries that lead to their relative position in the international system. The positions of countries can shift in response to changing external constraints.¹³ Domestic causes do not only have international effects nor do international causes only have domestic effects. It is better to speak of domestic-international entanglements constituting a so-called two-level game.¹⁴ It is the combination of a changing geopolitical landscape, domestic politics, preferences and circumstances, national interests, bounded rationality, the perceived position in the interna-

⁵ The fact that numerous NGOs are organised trans-nationally and companies operate in multiple countries does not change the fact that their influence in international political decision making runs through national representatives.

⁶ Amineh, M.P., *Globalisation, geopolitics and energy security in Central Eurasia and the Caspian Region*, pp. 20-21.

⁷ Social cohesion, the force of community, as used in the Shell *Global scenarios to 2025* is in our analysis part of the domestic level. Shell, *Global scenarios to 2025*, Shell International Limited, 2005.

⁸ Gilpin, R., *Global Political Economy: Understanding the International Economic Order*, p. 21.

⁹ *Ibid.*, p. 23.

¹⁰ Van der Linde, C., “Energy security in a changing world”, in: Bracken, P. et al. (eds.) *Managing Strategic Surprise; Lessons from Risk Management and Risk Assessment*, Eurasia Group, 2005, p. 244.

¹¹ *Ibid.*

¹² *Ibid.*

¹³ Moravcsik, A., “Introduction; Integrating International and Domestic Theories of International Bargaining”, in: Evans, P. et al. (eds.): *Double-Edged Diplomacy; International Bargaining and Domestic Politics*, Berkeley, University of California Press, 1993, pp. 3-43.

¹⁴ Putnam, R.D., “Diplomacy and domestic politics: the logic of two-level games”, in: Evans, P. et al. (eds.): *Double-Edged Diplomacy; International Bargaining and Domestic Politics*, Berkeley, University of California Press, 1993, pp. 431-469.

tional system of other actors and the inter-linkages between them which determines what the future international system will look like and in what context energy policy can be formulated.

2.3. Methodology

The objective of this study is to provide an analysis of key geopolitical changes in the international system, with particular attention given to energy related issues and to the EU, and on the basis of this analysis define possible directions of energy futures towards 2020.

To this end CIEP has developed a model based on two variables of uncertainty that determine the makeup of the international system (section 2.4). Assessing the scores of actors by using the two variables has made it possible to identify past and present trends of the international system. These trends have been important in formulating plausible (energy) futures.

The analysis conducted in this study is led by two lines of thought. One is based on the factual indicators of energy, economy, society, safety and (international) politics.¹⁵ The other is based on theoretical assumptions regarding an actor's policy preferences and preference-induced policy space (section 2.5 and 2.6).¹⁶ The two lines of thought are interlinked, and together they determine the actor's results with regard to the variables and the actor's related position in the quadrant model.

The position of a state can be seen as its position on an axis ranging from a political, state-driven stance with a focus on state power to an economic, market-driven stance with a focus on economic power. A group of actors concentrated around the same position can indicate a trend or a movement. The trends found throughout the analysis, in combination with actors' room to manoeuvre, have led to three energy futures within changing geopolitical landscapes.¹⁷ These three futures can be used to identify robust responses and policies to reach desirable ends and can also be used to decide on pre-emptive actions to ensure that certain undesirable outcomes are prevented.¹⁸

15

- *Energy*. For consumer countries: energy consumption patterns, energy mix, expected consumption growth, import dependency, most important supplier relations. For producer countries: export levels, revenues expressed as a percentage of the government budget, the extent to which the energy sector is open for private investment.
- *Economy*. Gross Domestic Product; Income distribution; Relation between the private and public sector; Most important international trade relations.
- *Society*. Demography, i.e. the build up of the populations in terms of age groups and in terms of religious or cultural minorities; Development of a civil society; social stability.
- *Safety* and defence. Maritime safety and security measures with focus especially on their relevance to the energy sector, i.e. surveillance of trade routes in international waters or sea lanes, safety of ships and harbours, safety of pipelines etc. (dry and wet routes).
- *(Inter)national politics*. National politics: national political system (number of political parties), the level of democracy (elections) and the legitimacy of the government. International politics: the adherence to international treaties, membership of international organisations, position within international community (is the country seen as a 'pariah state') and where relevant convictions for human right violations, resolutions by the UN Security Council, reform programme of IMF, etc.

¹⁶ The positioning of consumer countries in the quadrants model and the assessment of the effect this might have on other consumer and producer countries has been guided by a number of leading questions: 1) Where would actor A position itself?; 2) Does actor A expect a future shift in position?; 3) Where would other actors position actor A?; 4) Where does actor A position other countries?; 5) What does a certain position and trend mean for actor A in energy terms?

¹⁷ The focus of this study lies in identifying the possible futures and possible consequences for energy policy of the European Union. For this reason, the extensive information gathered on different actors serves as building stones for the analysis. In Chapter 4 a description of important actors is included.

2.4. Model of analysis: Two axes of uncertainty

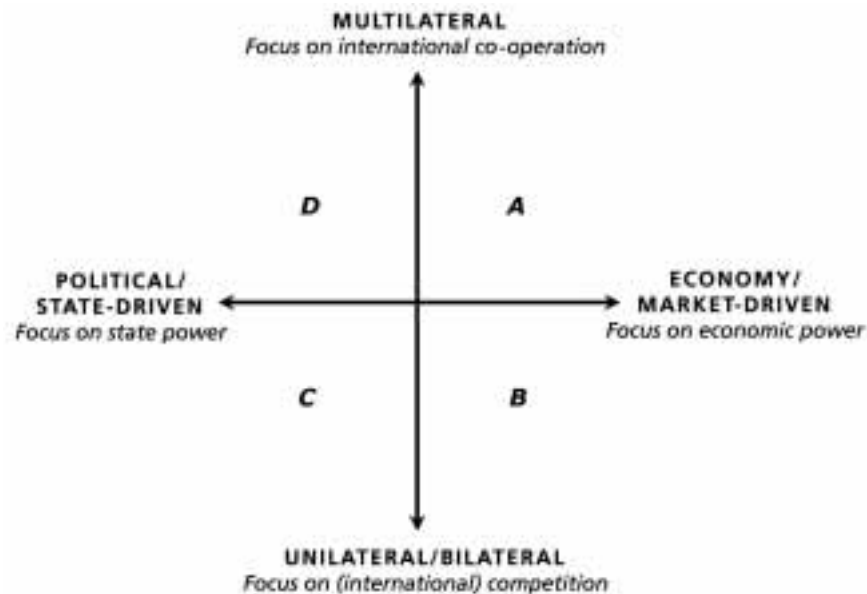


Figure 2.1 Quadrants model for analysis

The four quadrants in Figure 2.1 are constituted by the combination of two axes. The two variables underlying the axes together determine the context within which international political and economic relations and especially energy relations are likely to develop in the future.

Values on the vertical axis indicate whether the world is headed towards increased multilateralism and global governance or more towards bilateralism, outside global governance institutions. Actors positioned toward the top end of the axis focus on integration into a multilateral setting and co-operation within a collective. In contrast, actors positioned toward the low end shy away from multilateralism and prefer autonomy in their international relations which can express itself through international competition.

Values on the horizontal axis indicate whether the world is characterised by a state-driven political-strategic orientation of actors or by a market-driven economic efficiency orientation of actors. Actors positioned toward the politics end of the axis focus on strategic interest and political effectiveness. Actors positioned toward the economy side focus more on the market and economic efficiency as dominant principles. Since the model is meant to represent the international system, this is not similar to a state and market division. However, it is true that on the politics side of the spectrum the nation state will be the dominant organising principle. Companies, international institutions and NGOs will at least to a certain extent be functional for the strategic interests of nation states. The economy side will have a much more diverse group of actors with differing levels of influence, although market principles will be the dominant factor in the behaviour of many of these actors.

International economic activity will take place on both sides - not solely to the right - of the vertical axis, just as political considerations will be important on both sides and not merely to the left. The difference

¹⁸ Bruggink, J.J.C., *The next 50 years. Four European energy futures*, ECN, May 2005, p. 14; Institute for National Strategic Studies, *All Possible Wars? Towards a Consensus View of the Future Security Environment, 2001-2025*, McNair Paper 63, US National Defense University, November 2000, <http://www.ndu.edu>; Daum, J., "How scenario planning can significantly reduce strategic risks and boost value in the innovation chain", in: *The new New Economy Analyst Report*, 2001, <http://www.juergendaum.com>. The present study contains differences and similarities with Shell, *Global scenarios to 2025*, Shell International Limited, 2005. See for a brief methodology description of the Scenarios Box 2.6 at the end of this chapter.

between the two sides of the vertical axis lies in the purpose of economic activity. Is the purpose of economic activity to benefit individual consumers to promote certain social welfare goals, or is the purpose of economic activity to maximise national strategic interests? The purpose that a particular society (domestic or international) chooses to pursue determines in turn the role of the market mechanism.¹⁹

The positioning of actors is based on an interpretation of national policies and their effect on the position of a nation within the international system. It also shows the type of influence an actor has on other actors and therefore on international relations in general. A group of actors placed in the quadrants, in combination with their respective influence, will most likely indicate a dominant trend, e.g. the international system as an aggregated whole will be within or near a certain quadrant.

Below, a series of characteristics of every quadrant is given. It is important to note that none of the quadrants represents a fixed scenario. Rather, the axes should be read as scales that give information about the likely *orientation* or (perceived) *preference* that actors have when dealing with challenges and risks.

Box 2.1 – Markets and common interests (quadrant A)

Multilateral and Economy focus

- Governmental policy-making is shaped by an orientation towards principles of economic efficiency and by a focus on multilateral political and economic co-operation;
- Opportunities for consumers are maximised;
- The globalisation process is deepened;
- Economic drivers determine state behaviour;
- The goal of multilateral co-operation is especially to promote economic interests (WTO);
- Open conflict between nations is rare;
- Conflicts and disputes are settled by international institutions.

Box 2.2 – Markets and national interests (quadrant B)

Uni- / bilateral and Economy focus

- Governmental policy-making is shaped by an orientation towards principles of economic efficiency and by the actor's preference to act unilaterally;
- Opportunities for consumers are maximised;
- Economic drivers determine state behaviour;
- Multilateral co-operation is used only to promote clear national economic interests;
- Economic and foreign policies are entangled;
- Interests of companies are seen as national interests;
- Strong competition exists between states and companies, open conflict occurs occasionally;
- Countries retain an independent stance in the international community.

¹⁹ Gilpin, R., *Global Political Economy; understanding the international economic order*, p. 24. The 2005 Shell Scenarios distinguish between the "Nation State" whose policy is marked by a strive for power to maximise the nation's welfare and the "Market State" whose policy is characterised by maximisation of opportunities for consumers. Shell, *Global scenarios to 2025*, Shell International Limited, 2005, pp. 158-63.

Box 2.3 – States and national interests (quadrant C)

Uni- / bilateral and Politics focus

- Governmental policy-making is shaped by an orientation towards national interests and strategic manoeuvring and by the actor's preference to act unilaterally;
- The nation's welfare is maximised;
- Strategic thinking and national interests determine state behaviour;
- National security is the prime policy objective;
- Companies and non-state actors are extensions of state policy;
- Strong competition exists between states, open conflict occurs occasionally;
- Multilateral co-operation is sought if it serves strategic and national interests;
- Countries retain an independent stance in the international community.

Box 2.4 – States and common interests (quadrant D)

Multilateral and Politics focus

- Governmental policy-making is shaped by an orientation towards national interests and strategic manoeuvring and by a focus on multilateral (regional) political and economic co-operation;
- The nation's welfare is maximised;
- Strategic thinking and (inter)national interests determine state behaviour;
- Companies and non-state actors are extensions of state policy;
- Strong multilateral co-operation is reached through numerous institutions and international forums;
- Open conflict between nations is rare;
- Conflicts and disputes are settled by international institutions.

2.5. Energy policy

A number of theoretical assumptions about what determines or delimits an actor's room to manoeuvre underlie the analysis. For the purpose of this study we distinguish between assumptions about a consumer country's energy policy, the order of its energy objectives and the external influences that impact its energy policy.

This study builds on the widely accepted assumption that a consumer country's energy policy can be analysed in terms of three main pillars – security of energy supply, market and price efficiency and the environment. These pillars can be seen as the main goals of a consumer country's energy policy. Each consumer country must find a balance in pursuing all three policy goals at the same time; in other words, in the pursuit of a secure energy supply at reasonable prices which is least harmful to the environment. Figure 2.2 illustrates the tension field that exists between the three pillars.

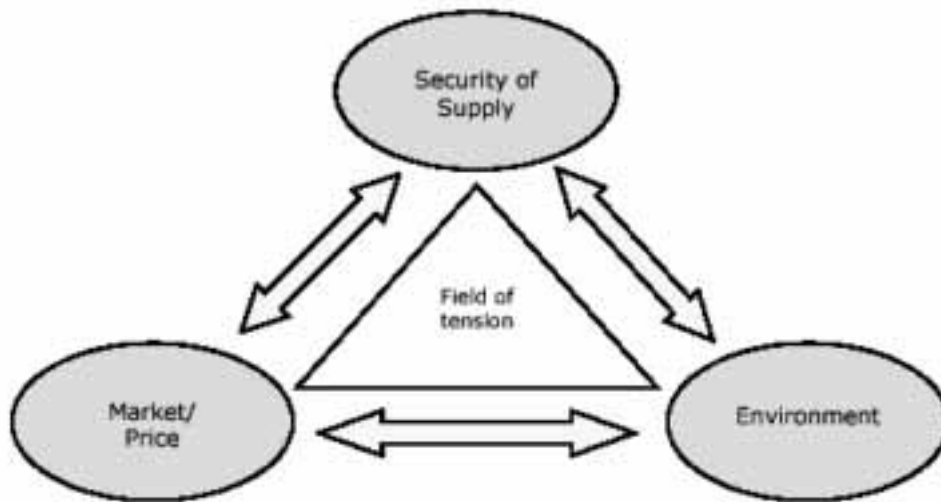


Figure 2.2 The three pillars of a consumer country's energy policy

The importance that is attached to each of the separate goals (and the price society is willing to pay for achieving that goal) varies between consumer countries and varies through time. Also the use of or emphasis on certain policy instruments varies between consumer countries and through time. As such, energy policy is an expression of the value that a society attaches to a certain property of energy policy and the efficiency of its instruments. For one consumer country, import dependencies higher than fifty percent of domestic demand set off alarm bells in policy circles, while other countries have learned to live with much higher levels of dependency.²⁰

In pursuing the three basic aims of energy policy there is usually a trade-off between the objectives. Energy security is about availability, but is subject to cost issues and environmental concerns. Choosing to liberalise energy markets and limit government influence to regulating markets also limits the possibility for governments to actively control the energy mix, leaving the choice to market parties. Similarly, environmental concerns surrounding the use of coal might make coal a non-option unless it is cleaned up, despite the fact that it is spread around the globe relatively equally and is hence a logical option from a security of supply point of view.

Although the balance between the three pillars that a consumer country pursues differs, a certain ranking of policy goals can nonetheless be acknowledged. Access to energy resources, the necessity of security of supply, efficiency of energy costs, low environmental taxes and societal acceptance of certain costs and risks are not all mutually exchangeable or negotiable. They are part of a hierarchical order in which inherently some layers are valued differently than others. Some lie literally at the base of this hierarchy and need to be solidified before the other higher layers can be accommodated.²¹ Figure 2.3 illustrates this hierarchy.

²⁰ Van der Linde, C., "Energy security in a changing world", p. 219.

²¹ De Jong, J. et al., *Dertig Jaar Nederlands Energiebeleid*, The Hague, CIEP, 2005, pp. 26-27.

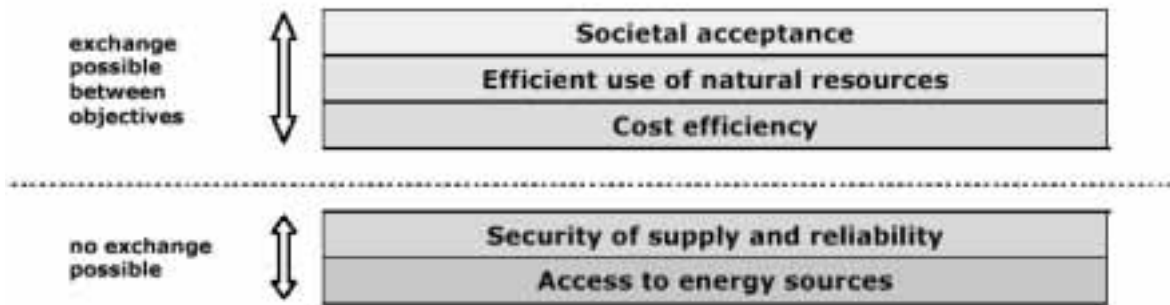


Figure 2.3 Order of energy policy objectives²²

When analysing and explaining a consumer country’s energy policy, policy making in other areas - e.g. the country’s economic policy, environmental policy, spatial planning policy, industrial policy, foreign policy and defence policy (and in the case of EU member states also policy-making at the EU level) - is of influence. Objectives in these policy areas can sharpen, weaken, limit or expand energy policy goals. In this study it is particularly relevant to find out where objectives of foreign and defence policy are related to objectives of energy policy and what the nature is of this relation. Figure 2.4 illustrates how objectives of various policy areas can influence energy policy.

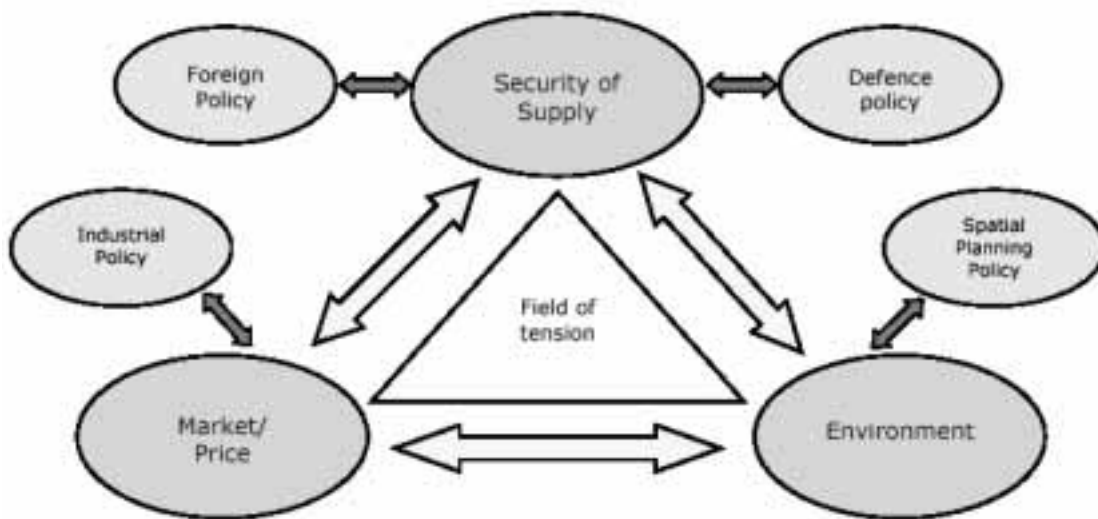


Figure 2.4 Some external influences on a consumer country’s energy policy

When analysing energy in relation to geopolitical developments and risks, the intervening impact of an actor’s foreign and defence policies are of particular interest. This becomes especially important for policy-makers wanting to learn about the policy space within which to operate. At the same time consequences of foreign or defence policy, e.g. adherence to conventions, treaties or multilateral institutions, can also offer opportunities. Less theoretically said: we assume that states can be bound by intergovernmental or supranational institutions but that they also can use these to their own advantage.

²² Based on De Jong, J. et al., *Dertig Jaar Nederlands Energiebeleid*, 2005. pp. 26-27 and Frei, C.W., “The Kyoto Protocol – a victim of supply security? Or: if Maslow were in energy politics”, in: *Energy Policy* 32, 2004, pp. 1253-1256.

Box 2.5 – Energy systems

The objectives of energy policy have to be reached throughout the entire energy value chain, from extraction to transport, conversion, distribution and end use. End users normally expect that whatever the time of day, lights can go on and cars can be filled up whenever needed. Trust in the energy system is very important for consumers, it must be reliable.

The energy system is more complex than the five-link chain may express. Every primary energy source has its own characteristics, problems and possibilities. The extraction processes can be challenging and subject to local political circumstances and (environmental) legislation. Similar difficulties are visible for transport. Tankers of a variety of different sizes have to pass several choke points before reaching ports in consuming countries. Once a tanker arrives at its destination, the receiving party has to be able to process it. Conversion is also subject to local legislation. The types of crude oil that can be processed varies from refinery to refinery. Power generation requires a certain fuel (some plants are dual-fired), of which natural gas has to come from multi-billion dollar pipelines or LNG projects. Electricity and car fuels have to be distributed to the end users, which has its own dynamics and problems.

A changing geopolitical landscape, globalisation, economic growth, changing demand patterns, climate concerns, different market regimes, security concerns, local environmental concerns, safety, NIMBY sentiments, active demand management by governments, additional demands by producer countries government, investment climate, innovation; the list of processes, concerns and challenges changing the energy sector are numerous. As the number of players in energy markets grows and legislative complexity increases, insecurity regarding future demand growth and future prices have made the energy system more vulnerable to disruptions, whether natural or political in nature.

2.6. Policy space

An actor's policy space is defined here as an actor's room to manoeuvre and to choose between a variety of policy options. An actor's policy space is shaped by its own actions and policy preferences as well as by those of other actors. The policy space per actor can be characterised as a continuum ranging from unlimited trust in the problem-solving capacity of the market to a preference for economic planning by the government.²³

The preferences and the organisation of the objectives of an actor's energy policy can lead to a contraction or expansion of this policy space. The policy goals found at the base of the hierarchy – access to energy resources and security of supply – are the first that need to be met successfully and are therefore called non-negotiable. Every actor wants to have access to energy sources and wants to secure supplies originating from these sources. However, there is some room for negotiating *within* this layer, i.e. there is room for contraction or expansion of the policy space even in this layer, e.g. as a result of the selection of supplier countries. Where one actor would – for whatever (political) reasons – not want to do business with a producer country, others could. Similarly, varying preferences between the layers can contract or expand an actor's policy space. Actors led by principles of cost efficiency, for example, will limit their spending on technological innovation or exploration and production projects that are not economically viable. These actors' policy spaces are clearly smaller than that of an actor that is less led by these preferences and is willing to pay a higher price.

Figure 2.5 illustrates how the positions of actors are interlinked, can mutually influence each other and shape their policy space. Ultimately an actor's policy space determines its choice of policy instruments.

²³ CIEP, *Study on Energy Supply Security and Geopolitics*, p. 52. In the study this is defined as the difference between the government and the market as 'solution space' shaping policy-making.

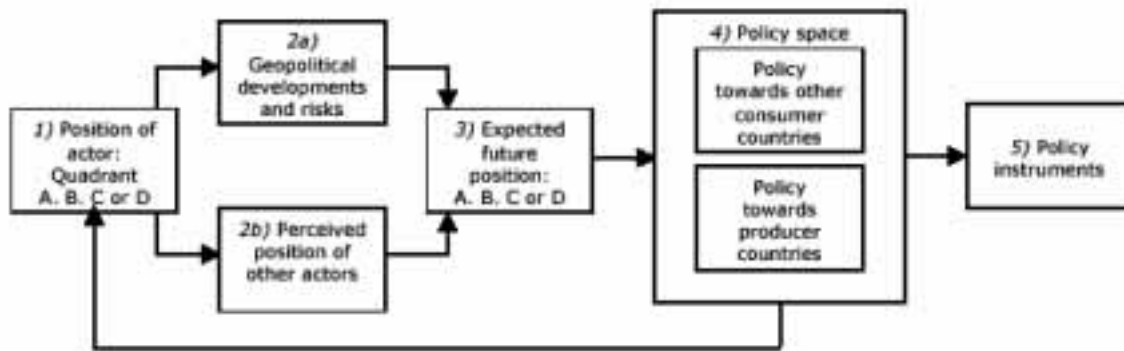


Figure 2.5 An actor’s position and its policy preferences

Box 2.6 – Shell Global Scenarios to 2025^a

The new *Shell Global Scenarios to 2025* look at the interplay between three essential forces and between the contrasted ways in which different groups can pursue their objectives. While they provide more complex and sometimes technical analyses of Shell’s business environment, these scenarios are based on a map which provides a simple, unified context designed to better understand the various conditions under which Shell may have to operate in different regions or in different circumstances. This helps to bring the scenarios close to the reality of business.

The analysis in the *Global Scenarios to 2025* is based on the three forces of market incentives, communities, and coercion or regulation by the state. These three forces drive towards different objectives: efficiency, social cohesion and justice, and security. While societies often aspire to all three objectives, the forces display elements of mutual exclusiveness.

The *Global Scenarios to 2025* explore the three dilemmas, dubbed “Trilemmas” involved in the pursuit of these three objectives. The Trilemma Triangle is used to map the interplay between market incentives, the forces of community (aspirations to conform to and be listened to) and forces of regulation and coercion.

The Trilemma Triangle strongly resembles the three pillar model for analysing a consumer country’s energy policy (Figure 2.2). The latter also contains apexes on security and market incentives. What differs is the inclusion of the factor ‘Social cohesion’, the force of community, where the energy policy model includes environment, or sustainability as third apex.

Comparing the Trilemma Triangle with the quadrants model (Figure 2.1) makes clear that again the difference lies in the factor ‘Social cohesion’. This Trilemma apex is not included in the quadrants model while in the Triangle there is no explicit room for the consideration of preference or aversion for multilateral co-operation.

Although the approach and focus in the *Global Scenarios to 2025* differ from the ones presented here, the analyses lead to comparable results. The three futures presented in Chapter 4 and 5 contain characteristics similar to the latest Shell scenarios which are briefly summarised in Box 4.1

a. Van der Veer, J., *Introduction to Shell Global Scenarios to 2025*, speech delivered at the launch of the scenarios, Royal Institute for International Affairs (Chatham House), London, 6 June 2005; and Shell, *Global Scenarios to 2025*, Shell International Limited, 2005, pp. 11-13.

3

Energy sources and policy

This chapter provides a general overview of developments in the energy sector, with a focus on challenges, risks and problems with relevance to foreign policy and geopolitics. It begins with a brief description of global energy demand and supply (section 3.1) and continues with a discussion of the demand and supply of five separate primary energy sources: oil, natural gas, coal, nuclear energy and renewable energy (section 3.2). It elaborates further on the tension field between the basic aims of energy policy-making and highlights concerns regarding efficiency of energy costs (section 3.3.1), security of supply (section 3.3.2) and the environment (section 3.3.3). It discusses the issue of energy poverty as an example of how a country's energy policy can be related to other areas of governmental policy making (section 3.3.4). The final section concludes. The annexes to this report contain more detailed information about energy carriers, energy policy and related energy issues upon which this chapter is based.

3.1. Energy demand and supply

Energy consumption is expected to grow globally, driven generally by economic and population growth. Energy demand growth is further underpinned by changing life styles, such as an increasing number of cars and household appliances used. Also the average size of households in developed countries is becoming smaller, increasing the total number of households and with it the number of household appliances. Table 3.1 shows global primary energy demand in 1971, 2003 and the projected demand in 2020 and 2030. The expectations are based on the Reference Scenario of the International Energy Agency (IEA) and is based on current policies adopted and implemented by the end of 2003.¹

	1971	2003	2020	2030	% global demand 2030
Oil	2446	3785	5036	5546	34.1
Coal	1439	2582	3301	3724	22.8
Gas	895	2244	3338	3942	24.2
Nuclear	29	687	778	767	4.7
Hydro	104	227	323	368	2.3
Biomass/ waste^a	683	1143	1454	1653	10.2
Other renewables	4	54	172	272	1.7
Total	5600	10723	14402	16271	100

a. Including traditional non-commercial use of biomass.

Table 3.1 Global primary energy demand in 1971, 2003, 2020, 2030

Source: IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, p. 82. Numbers in Mtoe, based on Reference Scenario

According to the Reference Scenario, in 2030 roughly 81 percent of demand is satisfied by fossil fuels. The *World Energy Outlook 2005* (WEO) presents two alternative scenarios; the Deferred Investment Scenario assumes that investments necessary in important producing countries are slowed by a variety of fac-

¹ IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, Paris, OECD/ IEA, p. 59.

tors, while the Alternative Policy Scenario factors in expected policies aimed at mitigating climate change. In the Deferred Investment Scenario fossil fuels account for 79.7 percent (12258 Mtoe); in the Alternative Policy Scenario this is 77.5 percent (11361 Mtoe).² Although it is possible to debate the assumptions underlying all three scenarios, what they show is that both the relative as well as the absolute importance of fossil fuels will remain large until at least 2030. With additional policy measures or sudden technological breakthroughs in alternative energy sources the picture might change, but even then, it is unlikely that fossil fuels will account for less than two thirds of total energy supply.

3.2. Primary energy sources

Patterns in consumption and production differ per energy source. This section presents the most important characteristics of the markets for oil, natural gas, coal, nuclear energy and renewable energy.³

3.2.1 Oil

The reserves of oil are unequally distributed over the globe. The bulk of the reserves is located in five countries around the Persian Gulf: Saudi Arabia, the United Arab Emirates, Kuwait, Iraq and Iran. Considering production and reserves it is likely that future oil demand increasingly will need to be satisfied with oil from these five countries. The picture is somewhat different when taking unconventional oil into account.⁴ Based on the calculations of the *BP Statistical Review of World Energy 2005*, the world proven (conventional) reserves would suffice to satisfy current demand for another 40 years (the reserve-to-production ratio). However, demand is predicted to grow which implies that new reserves are required to prevent the ratio from dropping. Investments in the past resulted in new additions to reserves, although super mega-fields, like those in the Persian Gulf, have not been discovered since the 1970s. It is important to note that the cost of finding oil is increasing and that important Non-OPEC oil provinces, such as the North Sea, are maturing. Production is expected to level off and decrease in the European Union and the United States. The main consumer countries are not the ones with the reserves and the production. Oil import dependency for all major importing countries will rise to over 70 percent.

The relative share of oil in total energy consumption is expected to decline slightly, but, according to the IEA reference case calculations, the total amount of barrels consumed per day will rise to 115 million per day by 2030.⁵ That is a rise of 38 percent in comparison to the 83mb/d of 2005.⁶ In 2020 the demand is projected at 105 mb/d. Most of this demand rise will materialise in developing countries, including China. China will become the second oil consumer of the world, following the United States. During the 1990s oil prices were low.⁷ Consequently, the oil sector invested modestly in production and exploration.⁸ In 2003 and 2004 the increase in energy demand was higher than expected. In the past, the production capacity always surpassed the demand. The two oil crises of the 1970s and the resulting price shocks were political in nature and entailed disruption of the supplies by production cutbacks. The shock was on the supply side. In the past few years the oil market again turned from a buyer's markets to a seller's market.

² IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, Paris, OECD/ IEA, p. 237 for the Deferred Investment Scenario and p. 270 for the Alternative Policy Scenario.

³ See for more information Annex A.

⁴ Canada and Venezuela have large amounts of unconventional oil. The production is however very energy intensive. Some large projects employ open mining, leaving a large environmental footprint. Depending on the oil price and technological development, unconventional oil sources will become more important on the oil market. See for more information: Gerling, J.P., "Non-conventional hydrocarbons: What, where, how much", in: Van Geuns, L. and L. Groen (eds.), *Fossil fuels; Reserves and alternatives - a scientific approach*, Amsterdam, KNAW/ CIEP, 2005, pp. 19-28.

⁵ IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, Paris, OECD/ IEA, p. 81 (Reference Scenario).

⁶ Average oil consumed per day based on quarterly figures, fourth quarter is an estimation. *Petroleum Intelligence Weekly*, 2005, November 14, p. 4.

⁷ Just after the Asia crisis in 1998 even less than USD 10.

⁸ Revenues of National Oil Companies (NOCs) go to the state and governments of producer countries needed the money to balance the government budget. International Oil Companies (IOCs) went through a period of cost reductions, restructuring and consolidation.

Production capacity today barely exceeds demand, by less than one million barrels per day. But contrary to the 1970s, the high prices today are the result of a demand shock.

The price of oil can be stabilised by creating sufficient spare capacity in the market. The OPEC spare capacity in the 1980s and 1990s resulted mainly from the lack of demand for OPEC oil, rather than being created deliberately.⁹ Considering the rising oil demand and the needed new production capacity to keep up with this demand growth, creating sufficient spare capacity seems unlikely.¹⁰ In the current oil market every barrel counts and therefore every producer as well. Political tension in producer countries, whether caused by strikes in Norway or acts of rebel groups in Nigeria, as well as disruptions with a 'natural' cause such as the tropical storms in the Gulf of Mexico all have an impact on the energy price. Uncertainties about new projects and possible future supply due, for example, to war and insurrection, restrains the necessary investments in the area. The pace at which Iraq will recover from the overthrow of Saddam Hussein is a case in point. In general the political and social instability in a large number of producer countries worries consumer countries and slows down company investments. Due to the increase of terrorist activity, globally but especially in the Middle East, the protection of oil production locations, infrastructure and transport is also a point of concern and cost.

Not only the production of crude oil has seen a combination of low investments in new capacity and unexpected demand increase; the same is true for the refinery sector. In 2004 the capacity to refine crude oil was only marginally higher than the demand for crude oil.¹¹ Environmental legislation has made it increasingly difficult to build new refineries close to consumer markets, especially in OECD countries. There is an expected increase in interregional trade of refined oil products from 10 mb/d in 2004 to 16 mb/d in 2030.¹² Demand comes primarily from the transport sector, which needs lighter and less sour oil products. The demand for these products is further stimulated by environmental regulation. Simultaneously, the supply of crudes becomes heavier and more sour. These crudes are more difficult to process and yield heavy products which means that additional processing is necessary.¹³ Matching refinery capacity with the supply of different crude oil types and demand for refined products will be one of the major challenges for the oil sector in the coming years.

All statistical projections of future consumption show an increasing call for OPEC oil, juxtaposed by the fact that by 2030, Persian Gulf production is expected to form the bulk of OPEC supply increases. Indeed, the *World Energy Outlook 2005* expects in the Reference Scenario that oil production in the Middle East and North Africa (MENA) will increase to 50 mb/d by 2030, up from 29 mb/d. The Persian Gulf countries, excluding Qatar, will produce twice as much, from 21.35 mb/d in 2004 to 42.9 mb/d in 2030.¹⁴ For the total production increase the IEA estimates that USD 614 billion needs to be invested in the oil sector or USD 23 billion a year.¹⁵ If investments are only forthcoming according to the Deferred Investment Scenario, oil production in MENA can be 30 percent lower or 35 mb/d.¹⁶ Saudi Arabia, for example, will produce 14.1 mb/d in 2030 instead of the projected production of 18.2 mb/d in the Reference Scenario.¹⁷ This 14.1 mb/d is much closer to the 15 mb/d recently mentioned by Saudi Arabia as the likely top level for production.¹⁸

⁹ Van der Linde, C., "Energy security in a changing world", in: Bracken, P. et al. (eds.), *Managing Strategic Surprise; Lessons from Risk Management and Risk Assessment*, New York, Eurasia Group, 2005, p. 209.

¹⁰ There is also the question who will be willing and capable to bear the costs of creating and maintaining the extra capacity.

¹¹ IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, Paris, OECD/ IEA, p. 96.

¹² *Ibid.*, p. 101.

¹³ *Ibid.*, p. 97.

¹⁴ *Ibid.*, pp. 146-149. Export capacity is lower, due to domestic consumption.

¹⁵ *Ibid.*, p. 119.

¹⁶ *Ibid.*, p. 227, Deferred Investment Scenario.

¹⁷ *Ibid.*, p. 147 and p. 241.

¹⁸ "OPEC can't meet West's oil demand, say Saudis", *Financial Times*, 7 July 2005.

Besides uncertainties surrounding stability of producer countries and investment levels, some experts have repeatedly questioned the reserve data of OPEC countries and the debate about a nearing decline in world oil production continues today.¹⁹ The fact that the international oil market currently lacks the transparency to verify reserve data can be a continued source of uncertainty in the future.²⁰

3.2.2 Natural gas

The development of natural gas markets has been driven by the availability of domestic resources, the wish of governments to change the composition of the mix of energy carriers, or both. The development of the European natural gas market for example was initiated by the desire of the Dutch government and international oil companies to monetise the discovery of the giant Groningen field. In contrast the Japanese gas market was developed on the basis of imports out of the desire to become less dependent on imported oil and to cope with environmental problems.²¹

More than two thirds of the world's gas reserves are found in the regions which are also likely to dominate future oil supplies: the Middle East, the Caspian Sea region and Russia, among which Russia (27 percent), Iran (15 percent) and Qatar (14 percent) are by far the most important resource holders. There are many more countries around the globe that can expand their contribution to world gas supply in the future, however with a far less comfortable resource base. Besides the three countries mentioned, increasing supplies for world markets are in the future expected to come from countries such as Norway, Algeria, Nigeria, Libya, Peru, Trinidad and Tobago, Oman, Indonesia, Malaysia, Brunei, and Australia. The current ratio of gas reserves to production stands at about 65 years.²² Much of the currently known gas resources were considered to be 'stranded', i.e. located too far away from the major consuming regions to make it economically viable to develop and export them. Gas trade and gas markets were mainly regional and pipeline bound with little to no direct relation to developments in other consuming regions.²³ Over the last two decades, however, substantial technological advances have brought down costs for new pipelines and particularly for Liquefied Natural Gas (LNG) technology, making it economical to bring formerly stranded gas to major export markets.²⁴ The flexibility brought by transporting gas as LNG with respect to destination of exports is gradually leading to a stronger linkage between the major gas markets.

Gas demand is expected to increase in North America, Europe and Asia and all these regions will increasingly depend on imports, despite having domestic gas resources. Gas production in North America is projected to decline and European gas production will at best remain at current levels over the next few years. The limited gas reserves of China are located in the West of the country while the demand is concentrated in the East, making LNG import an economical option. The major consumer countries will compete to a larger extent than before for the same resources.²⁵

¹⁹ Simmons, M., 2005, *An Energy Tsunami ahead*, presentation at 2005 AAPL Annual Meeting, Banff Canada. Campbell, C.J. and J.H. Laherrère, "The End of Cheap Oil; global production of conventional oil will begin to decline sooner than most people think, probably within 10 years", in: *Scientific American*, March 1998, pp. 76-83.

²⁰ The Joint Oil Data Initiative may change this. Launched in 2001 by APEC, Eurostat, IEA, IEFIS, OLADE, OPEC and UNSD (see the list of abbreviations for full names of these organisations), JODI was set up to raise the awareness of all oil market players of the need for more transparency in oil market data. It currently works on increasing the coverage of countries, to reduce the delay in data submissions and to further enhance the data quality. See www.jodidata.org.

²¹ Compare Correljé, A., C. Van der Linde and T. Westerwoudt, *Natural gas in the Netherlands*, Amsterdam, ONG/ CIEP, 2003 and Miyamoto, A., "Natural Gas in Japan", in: Wybrew-Bond, I. and J. Stern, *Natural Gas in Asia*, Oxford Institute for Energy Studies, 2002, pp. 106-187.

²² BP, *Statistical Review of World Energy 2005*, p. 8 and p. 24.

²³ In Asian markets geography made pipelines often virtually impossible and imports have long taken the form of LNG.

²⁴ The LNG chain comprises cooling natural gas to a temperature of minus 160°C, thereby liquefying it, shipping it on tankers and regasifying it in the harbour of destination, where it can be injected in regular pipeline networks.

²⁵ Algemene Energieraad, *Gas voor Morgen*, The Hague, 2005.

The power sector is the main driver for gas demand in most regions, complemented by increases in residential gas demand for space heating. New technologies in the power generation sector (CCGT - Combined Cycle Gas Turbine power plants) have made gas a very economical power source in the last decade. Moreover, natural gas offers handling and environmental advantages as compared to oil and coal. Natural gas can also be used in the transportation sector in the future in the form of GtL.²⁶ However, due to the rather high substitutability of gas with oil products, gas prices closely follow oil product prices and have experienced a pronounced upward shift in recent years. Consequently, the very optimistic demand forecasts of a few years ago are being adjusted downwards.²⁷ Regulatory interventions in gas supply and political struggles about the 'right' marketing of domestic gas resources have also cast doubts on the availability of gas supplies in some markets, which might also have a depressing effect on gas demand.²⁸

Despite the still vast amount of natural gas reserves, high gas prices and the large investments being made for new gas supplies, it is not self-evident that supply can follow demand without (temporary) scarcity appearing in the market. Russia, for instance, faces the challenge of replacing declining production from existing major fields and extending production in order to increase exports, having to operate in difficult environments in the Barents Sea and Siberia. Qatar currently appears to be exploring the logistical and organisational limits of conducting multiple major gas supply projects simultaneously, and in Iran politicians are passionately discussing whether the large LNG export projects on the drawing board should be cancelled in favour of using gas for fuelling domestic power generation and enhanced oil recovery applications (re-injection).

In the European Union, the gas industry as well as commentators have long argued that changing market environments, triggered by the liberalisation efforts in the European Union, have made it more difficult to realise investments for new gas supplies as liberalised markets put pressure on traditional long-term arrangements that are said to be needed to provide volume and price security for producers and primary purchasers.²⁹ Currently, at least infrastructure investment appears to contradict such fears; plenty of new projects are being executed to facilitate additional supplies coming to the market.³⁰ The problem seems to lie more in the question of whether there will be sufficient gas available to fill these pipelines and LNG terminals. Availability of additional gas supplies will very much depend on the availability of capital and technology for new upstream projects, which in turn will depend at least in part on the openness of producing countries to foreign investment, their fiscal regulations and the safety situation.

The IEA *World Energy Outlook 2005* presents the following on MENA supply. In 2003 production of natural gas in MENA was 385 bcm out of a total world production of 2717 bcm (14 percent of total world production).³¹ In the Reference Scenario, MENA production will rise to 1211 bcm and the total world production to 4789 bcm in 2030 (MENA share of production thus being 25 percent).³² To enable the export a total investment of USD 436 billion is needed for the period 2004-2030, or USD 16 billion annually.³³ Considering domestic consumption, 436 bcm (36 percent) of the production can be exported. In the

²⁶ Gas to Liquids. GtL technology basically transforms natural gas into liquid energy products that can be used the same way as high-value oil products. See for example the presentations at the CIEP seminar "Transition policies and the role of GtL and CtL", 27 June 2005. <http://www.clingendael.nl/ciep>.

²⁷ Compare Tönjes, C., *Gas to Power in Europe*, The Hague, IGU/EDI/CIEP Discussion Paper, 2005; and IEA, *World Energy Outlook 2002*, Paris, OECD/ IEA and IEA, *World Energy Outlook 2004*, Paris, OECD/IEA.

²⁸ Compare: Honoré, A., *Argentina: 2004 Gas Crisis*, Oxford Institute for Energy Studies, November 2004. <http://www.oxfordenergy.org/pdfs/NG7.pdf>.

²⁹ CIEP, *The Case for Gas is not self-fulfilling!*, The Hague, CIEP, January 2003.

³⁰ See for more information on liberalisation in the EU Annex B.

³¹ Roughly 33 percent of the region's production comes from North Africa, the rest from the Middle East. Algeria is the biggest producer of natural gas. IEA, *World Energy Outlook 2005: Middle East and North Africa Insights*, Paris, OECD/ IEA, p. 176.

³² Ibid. Roughly 29 percent of the region's production in 2030 comes from North Africa, the rest from the Middle East. Qatar and Iran will be bigger producers than Algeria.

³³ Ibid., p. 182.

Deferred Investment Scenario higher oil prices lead to higher gas prices. Demand, especially in Europe and the United States, will be considerably lower. Natural gas production will be 20 percent lower in 2030 in MENA, or 238 bcm. Exports from the region will only be 230 bcm, 206 bcm lower in comparison to the Reference Scenario.³⁴

3.2.3 Coal

Coal resources are substantial and geographically well distributed around the world. Of all fossil fuels, it has the highest reserves to production ratio, exceeding 200 years and also the largest remaining proven reserves in energy terms.³⁵ Its availability marks coal as an important fuel for the future. Over the past few years, coal markets have experienced a significantly higher growth than the markets for any other fossil fuel.

Due to the wide distribution of coal resources, coal is mostly produced and consumed locally and transnational trade is mostly regional. In 2004, only about 16 percent of the global coal production was exported and consumed outside the country of origin; for natural gas that was 28 percent and oil 52 percent.³⁶ Many important consumers such as China are also large producers. In recent years there has been some competition and associated higher prices caused by the growth of demand in China that could not be matched locally due to production and infrastructural problems. China produced almost 2 billion tons of hard and brown coal in 2004. The US is the second producer with roughly a billion tons. The biggest exporter is Australia, the biggest importer Japan.

A wide variety of coal suppliers serve the competitive international market for steam coal, although there is a trend towards further consolidation and concentration, with a few private companies acquiring mining activities around the world. Prices are determined by supply and demand in world markets. Impressive increases in productivity have been achieved over the last decades, allowing world market prices to remain relatively stable over time. This trend is expected to persist. However, like many other bulk commodity industries, the coal industry has been subject to investment and price cycles. Periods of sluggish demand in times of low economic growth have led to decreased investment in new production capacity which in turn have resulted in temporary supply shortages and higher prices when demand growth accelerated again. Such a situation occurred during 2003-2004 when unexpectedly strong demand led to much higher prices for coal supplies and, more importantly, transport capacity. When coal prices will again fall closer to supply costs depends on the development of bulk shipping markets, the prices of alternative fuels (especially natural gas) and the extent to which new investments will increase production and transport capacity. It appears that investment in mining and bulk-shipping capacity has picked up and that scarcity in the market is being reduced.

The expected ongoing rise in coal use brings along environmental challenges. Among the fossil fuels, coal comes with the largest environmental concerns. High NO_x and SO_x emissions cause local environmental and health problems and the high CO₂ emissions make coal a large contributor to global warming.³⁷ Developing technologies to make the use of coal cleaner is high on international research and political agendas. In an effort to find substitutes for oil products, Coal-to-Liquid technologies are receiving more attention.³⁸

³⁴ Ibid., pp. 246-247.

³⁵ BP, *Statistical Review of World Energy 2005*.

³⁶ IEA, *Key World Energy Statistics 2005*, Paris, OECD/IEA.

³⁷ NO_x and SO_x are oxides of nitrogen and sulphur respectively.

³⁸ See for example the presentations at the CIEP seminar "Transition policies and the role of GtL and CtL", 27 June 2005, <http://www.clingendael.nl/ciep>.

3.2.4 Nuclear

Nuclear energy today plays an important role in power generation. The United States has roughly 30 percent of global nuclear capacity, France around 15 percent.³⁹ In the EU, nuclear power accounts for 36 percent of all electricity consumed.⁴⁰

Nuclear power plants are highly capital-intensive investments. The building of new plants virtually stopped after the mid 1980s. A combination of falling prices of fossil fuels that deteriorated the competitive position of new plants, of reforms of electricity markets in the United States and Europe to enhance competition and raising efficiency in the power sector and of negative public opinion caused by the long-term problem of nuclear waste and concerns about the safety in the wake of the Chernobyl disaster, made nuclear energy an unattractive option. Increased attention in recent years for security of energy supply and concerns about climate change has reopened the debate on nuclear energy. Nuclear energy contributes to security of supply and radically combats a particular environmental concern of CO₂ emissions.

The different elements of the nuclear fuel cycle have different safety and security risks. Safety is an issue particularly in waste management because of the long lifetimes of the fission products. The greatest concerns, however, lie in international security and the proliferation of nuclear technology, specifically technology related to enrichment and reprocessing plants.⁴¹ Trade in nuclear technology and material is traditionally fiercely debated in international relations and diplomacy and pressure is exerted towards countries trading it. Especially the United States, but also the EU member states, consider the possession of nuclear technology and raw materials in the hands of “rogue states” a major threat to international security.⁴² At the moment non-proliferation issues are especially problematic in the case of North-Korea and Iran. According to some experts and commentators the current non-proliferation regime might be inadequate.⁴³

The uranium reserve situation for the long-term future appears not to be of particular concern. Although exploration had practically come to a standstill in the 1990s due to limited prospects for nuclear energy and the availability of so-called secondary uranium from the reduction of nuclear weapons arsenals, most experts believe that there are ample resources available. New mining projects are currently underway around the world. The reserves are located in a variety of countries, such as Australia, Canada and Kazakhstan, in addition to Russia, the US and some African countries.⁴⁴

Research efforts are currently being strengthened, such as on inherently safe reactor designs (the large multinational G-IV project, where the US is cooperating with the EU, individual European countries and Japan), and on nuclear fusion.

3.2.5 Renewable energy sources

Renewable energy sources will become more important in the future, but their success is highly dependent on technological breakthroughs, governmental support and the integration of environmental costs into energy prices. The share of renewable energy has increased in the past decades, but the impact is still small. The notable exceptions are hydropower and biomass. Hydroelectricity has long been used in elec-

³⁹ RWE, *Weltenergiereport 2003*, Essen, Germany.

⁴⁰ IEA, 2002, *Electricity Information 2002*, Paris, OECD/IEA.

⁴¹ Greenwald, J.M., “Keeping the nuclear power option open”, *Oxford Energy Forum*, issue 61, 2005, p. 5.

⁴² See for a discussion on non-proliferation in the future Lubbers, R.: *Moving beyond the stalemate: addressing the nuclear challenge by supranational means*, CIEP Briefing papers number 3, 2005. <http://www.clingendael.nl/ciep>.

⁴³ For example Van Ham, P., “Nuclear Iran is niet te voorkomen”, in: *NRC Handelsblad*, 9 August 2005.

⁴⁴ Compare Mason, T. and A. Max, “Stand und Perspektiven des internationalen Uranmarktes”, in: *Energiemwirtschaftliche Tagesfragen*, 55, 2005, pp. 769-73 and NEA, *Uranium 2003: Resources, Production and Demand*, Paris, OECD/NEA, 2004.

tricity supply worldwide. It is very often an economically competitive alternative to fossil fuel-fired power generation and in 2002 contributed 16 percent of all electricity generated globally.⁴⁵ Although there is additional potential for hydroelectricity, increases in production capacity will at best keep its share in electricity generation constant, given a strong expected electricity demand increase. Other renewable energy sources such as biomass, wind and solar energy have the principal problem that large areas are required to regularly generate significant amounts of energy. Especially biomass at a certain point might start to compete with food production for scarce arable land. High oil prices, high CO₂ prices and future innovations might alter the outlook. Fossil fuels will remain dominant, however, for the first half of the 21st century.

There are three reasons why the promotion of renewable energies is important. First is the pollution caused by the use of fossil fuels. Secondly, the reserves of fossil fuels are finite and alternative fuels must eventually be developed. And thirdly, most renewable energy sources can be produced – at least to some extent – indigenously, adding to the security of energy supply. However, with the exception of bio fuels, renewable energy forms are mainly suitable for use in the power sector, therefore not mitigating oil dependency.

3.3. Energy policy

Securing energy supply is one of the key issues in energy policy-making. Each country makes its own choices in the structuring of its energy mix and the balance between different primary energy sources. Besides the objective of supply security, energy policy involves components of energy costs and environmental considerations. At the same time, energy policy is influenced by a host of external objectives and commitments in areas such as foreign policy, development co-operation and trade policy, which affects the country's policy space.⁴⁶ This makes energy policy a complex issue in which a country has to find a balance between numerous, sometimes conflicting, aims, approaches and interests and do so within its policy space. This section illustrates the complexities surrounding the formulation of energy policy.

3.3.1 Costs

Past experiences have demonstrated that possibilities to influence energy prices are limited. The political turmoil during the 1970s resulted in two severe oil price shocks. During the first crisis in 1973, crude oil doubled in price overnight. The high oil price led to a sudden and large flow of funds from oil importing to oil exporting countries. Economists have conflicting views as to the extent to which higher oil prices have a direct influence on economic growth.⁴⁷ Intuitively, at least part of the severe recession in the oil importing countries in 1974 and 1975, with high inflation and high unemployment, can be explained by increased energy costs. The second price shock occurred from 1978-80 when doubling oil prices caused another sudden transfer of funds to oil exporting countries. Immediately thereafter followed, once again, a severe recession.

The demand and supply situation of oil, within certain limits being a substitute to almost any other energy source, affects the price of virtually any other energy source.⁴⁸ Costs of fuels derived from crude oil form a very significant part of the costs incurred in the transport sector. Oil is also the basic raw material for

⁴⁵ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 431.

⁴⁶ See also Figure 2.4 and Section 2.6.

⁴⁷ See: Bohi, D.R. and M.A. Toman, *The economics of energy security*, Boston/ Dordrecht/ London, Kluwer Academic Publishers, 1996, pp. 48 and further and the references therein. Claude Mandil, Executive Director of the IEA, states however that high oil prices hurt the economy and he quotes President Bush who called it "A foreign tax on the American dream." Mandil, C., *Statement on High Oil Prices*, Paris, OECD/IEA 29 June 2005. <http://www.iea.org/textbase/papers/2005/mandil.pdf>. A 2004 IEA paper calculates that all oil importing countries will experience lower economic growth rates due to high oil prices, but that oil importing developing economies are expected to be hit hardest. IEA, *Analysis of the Impact of High Oil Prices on the Global Economy*, Paris, OECD/IEA, May 2004. http://www.iea.org/textbase/papers/2004/high_oil_prices.pdf.

the plastics and petrochemical industries. An increase in oil price implies an increase in the production cost of all goods requiring energy for their manufacture, of the transport sector, and for all sectors that use oil as a raw material. Thus the price of oil directly or indirectly influences every economic sector.

Higher oil prices increase production costs and thus contribute to inflation. Sharp price increases will engender a decline of consumption levels, leading to declining profits for most companies. Producers will scale back production and postpone investment decisions, causing unemployment levels to rise. An oil-importing country can run the risk of getting trapped in a downward spiral, initially caused by the high oil prices. Given a relatively small cost share of energy in the economy, there is dispute as to the degree that price increases for crude oil as such can cause far-reaching economic disturbances.⁴⁹ However, the psychological effect of a highly volatile oil price should not be underestimated; it creates uncertainty for producers as well as for consumers. As owners of private cars, the latter group regularly shows a high interest in transport fuel costs. An increase in oil prices thus has a stronger influence on perceived inflation and the willingness of consumers to spend than price increases of other goods. Due to the high involvement of consumers, oil prices can also play a role in elections. Governments are therefore not only interested in stable oil prices for purely economic but also for more direct political reasons, as illustrated by the different reactions to high energy prices by governments of EU member states.

Higher oil prices have always led to discussions between consumer and producer countries. Consumer countries put pressure on OPEC and especially on Saudi Arabia to increase production and thus attempt to lower the oil price. Producer countries also have an interest in maintaining prices at a reasonable level, but their interests do not necessarily match those of consumer countries. Producer countries often point out the high tax share in the final price for oil products in many Western economies. As stated before, the lack of spare capacity and of matching refinery capacity has limited the possibilities to influence price increases with higher production, thus part of the attention of consuming countries has shifted towards investments by producer countries in new capacity.

Although reasonable prices are important, access to energy is more important. Not having energy holds back economic development and growth (see also 3.3.4 on energy poverty). At this moment for countries such as China and India with their rapid growing demand for energy, access is the most important priority. The focus in energy policy had shifted for most OECD countries from access (in the 1970s) to environmental concerns (in the 1980s) and efficiency gains and costs (in the 1990s).

The US and the EU have embarked on a liberalisation process in the gas market, which regularly involves two elements: allowing customers to freely choose their supplier, and opening existing networks to multiple parties for use. The idea behind liberalisation is to increase competition between companies which would in turn lead to lower prices for customers. Efficient energy use and low prices would enhance the global competitive position of a country. Although the liberalisation process in principle concentrates on the organisation of the domestic energy market, it also changes the market environment in which external suppliers have to market their resources.⁵⁰ It leads to a hybrid situation in most regional gas markets, where consumer countries are liberalised and have multiple parties in the market arena, while producer countries operate large state-owned companies. The liberalisation process also means that the tools and policy instruments that governments can use to influence the energy system fundamentally change, both for security of supply as for environmental concerns.

⁴⁸ In some consuming regions natural gas prices are directly linked to the oil price, so that an increase in oil prices will almost linearly affect the natural gas price.

⁴⁹ Bohi, D.R. and M.A. Toman, *The economics of energy security*, Boston/ Dordrecht/ London, Kluwer Academic Publishers, 1996, p. 51.

⁵⁰ See also Annex B.

3.3.2 Security of energy supplies

Security of supply policy is a general term to indicate the access to and availability of energy at all times.⁵¹ The focus of this report lies on the availability of primary fuels and less on technical security issues related to the domestic transportation of energy products. The different elements of security of supply are discussed below.

Domestic supplies

From a security of supply perspective the maximisation of domestic production is an ideal option. The production of energy comes from indigenous sources, guaranteeing access and availability of energy. If a country is endowed with domestic energy resources, it can decide to favour its domestic energy industry, for example with subsidies, to decrease import-dependency for a certain fuel type. Another way to increase domestic energy production is by promoting nuclear energy or energy produced from renewable energy sources. France, for instance, invested heavily in nuclear power plants in the 1970s and 1980s to decrease import dependency.⁵² Higher energy efficiency is an option to manage energy demand.

Considering production and availability patterns of oil and natural gas, major consumer countries/regions cannot become self-sufficient for oil and natural gas. For both fuels the import dependency will even increase in the coming decades.

The extent to which domestic energy production is possible – besides resource endowment or the capacity to produce non-fossil energy resources – depends on costs aspects and the design of the market, but also on membership provisions of multilateral institutions such as the WTO or the EU and international commitments.

Decreasing the impact of a supply crisis

Promoting flexibility in the energy system is a way to increase the number of options to deal with a temporary supply problem or high prices of a certain fuel type.⁵³ Power plants that usually run on natural gas, for example, could be fitted to run on oil products as well, of which the plants would keep a certain stock. Having generally sufficient amounts of oil stocks and possibly of natural gas might serve as a buffer when facing temporary disruptions to supply. These stocks must be complemented by some supporting infrastructure and refinery capacity. In August 2005 the impact of the disruption caused by hurricane Katrina was more than it otherwise might have been, due to a lack of sufficient refinery capacity to process the crude oil that was available. Since the hurricane incapacitated several refineries, the solution might have been to use stocks of oil products. The EU and Japan keep stocks of oil products, but the US at the time did not.⁵⁴ China is currently working on strategic oil stocks. Strategic stocks might withhold producer countries from limiting supplies in case of disputes with consumer countries. This is more effective if consumer countries cooperate with one another. Since the first oil crisis, the OECD countries do so in the International Energy Agency; of which up and coming countries such as China and India are not members. In theory this might limit the possibilities for the international community to deal with problems in producer countries, since some countries are more vulnerable to supply disruptions.

Diversification

Diversification can be pursued in terms of fuel type and of supplier. All of the (markets of) primary fuels described above have limitations and possibilities. Renewable energy sources can – if only to a limited extent – decrease import dependency on fossil fuels. In the past diversification was partly achieved by

⁵¹ See also CIEP, *Study on Energy Supply Security and Geopolitics*, pp. 64-76 on security of supply policy tools.

⁵² At the time, French power generation relied heavily on oil products. The choice for nuclear energy mitigated therefore directly oil import dependency.

⁵³ For information on emergency oil stocks, see Annex B.

⁵⁴ CIEP, *Study on Energy Supply Security and Geopolitics*, p. 68.

shifting away from Middle East suppliers and from oil to natural gas and coal. Since oil and gas resources outside the Middle East are becoming increasingly scarce, diversification away from that region towards other producers appears a less viable option. As substantial future production increases will come from only a few countries, consumer countries will need to compete with each other for the same resources.⁵⁵ This competition can be on economic terms in a market setting, or may take place in a more politicised setting.

Foreign and security policy

Foreign and security policy can be an important part of safeguarding energy system security and of crisis prevention policy-making.⁵⁶ 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. With regard to energy security we can distinguish bilateral and multilateral policies, in addition to the co-operation in the framework of the World Bank and United Nations organisations such as the UNCTAD, UNDP, IAEA, etc. It is important to note, however, that the role of the UN in energy is limited to some upstream investments, non-proliferation of nuclear weapons, energy poverty and sustainability. Energy diplomacy and especially oil relations are virtually not dealt with in the UN framework. The most effective multilateral organisations within the energy field are OPEC as a producer organisation and the IEA as a consumer organisation. Success of both depends largely on common interests. Especially OPEC has had its share of problems when interests of member states were not politically easy to match.⁵⁷ The International Energy Forum is the platform where producers and consumers discuss with one another the energy sector, but it is still a relative newcomer as an organisation.⁵⁸ Its success is heavily dependent on the broader climate of international cooperation.

Bilateral relations between consumer and producer countries have always been very important in oil and natural gas. Examples of special relations between countries are the US-Saudi Arabia and EU-Russia.⁵⁹ The former has become somewhat strained after 11 September 2001; the latter is to a certain extent still in the making. The relation and cooperation between the US and Saudi-Arabia goes beyond energy relations. "The US energy security was 'traded' for protecting the integrity of Saudi Arabia as a country and to protect the Saudi regime from external and international threats."⁶⁰ It is important to note that the US was never the single recipient of Saudi oil; the Saudi oil was produced for the international oil market. This is of course a special case as most bilateral relations hardly go beyond the realm of economic ties and diplomacy. The nature of the bilateral relation is largely determined by the general strategy of an actor which can be directed toward securing energy supply through the market or through an equity approach.⁶¹ The actor's strategy determines its preferences, e.g. on trying to advance the integration of a producing country into the world market, on transparency of reserves, on a framework for foreign direct investment (FDI) in the energy sector, on reforms in the economy, on political reforms or on strengthening governmental ties with the other country and concluding agreements and contracts on investments and long-term deliveries of oil and gas from the producer country to the consumer country.

Instability, unrest and violent attacks on energy infrastructure in producer countries are in the short term one of the most important concerns for a supply disruption. The social and political situation can be part

⁵⁵ Ibid.

⁵⁶ See for additional information Annex C.

⁵⁷ Van der Linde, C., *Dynamic international oil markets*, Amsterdam, University of Amsterdam, 1991 and 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.

⁵⁸ The permanent secretariat in Riyadh was founded in 2003; all participating countries accepted the mission and general framework during the 8th IEF in Osaka in 2002.

⁵⁹ CIEP, *Study on Energy Supply Security and Geopolitics*, pp. 69-70.

⁶⁰ Ibid., p. 69.

⁶¹ In an equity approach consumer countries make direct upstream investments in producer countries. Production from these investments goes to the consumer country and will not be sold on the international oil market.

of diplomatic contacts. The actual possibilities to influence the situation in producer countries is limited however; even more so for smaller consumer countries. Security can be discussed and cooperation is possible, but only in rare cases do such discussions lead to an active contribution to the security of energy infrastructure. Especially the US has a long track record of providing military aid; so did Russia during the time of the Soviet Union. Increasingly, China is also active in aiding in security issues in the Caspian Basin.⁶² The EU has no direct link between interests and military and security involvement, as that is the prerogative of the individual member states. In the period 1995-2002 European countries were the biggest suppliers of arms to countries in the Middle East, though that does not necessarily mean a close military relationship.⁶³

The possibility of exercising military pressure upon producer countries in times of crisis, or guaranteeing support in possible conflicts and having the military means to back up that promise, might increase an actor's security of supply. In ultimate cases the response to a threat to security of supply might be a military intervention or another way of intervening in a producer country.

Final remarks

The increase in import dependency of important consumer countries is inevitable, despite the available possibilities to become more energy efficient or diversify away from oil and, to a lesser extent, natural gas. Competition for these supplies is very likely. The question relevant to this study is under which circumstances that competition will take place: through the market or through political relations. The more politicised energy relations become, the more important foreign, security and even military policies become. The importance of access to and availability of energy makes security of energy supplies a driver for future geopolitical developments, as well as prey thereto.⁶⁴

3.3.3 Environmental concerns

As the use of energy can have harmful consequences for the environment, a country's energy policy should take into account environmental concerns. Burning fossil fuels causes emissions of waste products. Some are toxic, some contribute to acid rain, some contribute to global warming. Chinese and Indian metro poles are among the most polluted cities in the world due to coal-fired power plants and transport, causing health problems. Environmental measures implemented in the US and Europe limit the possibilities for investments in refinery capacity in these countries. Moreover fossil fuel resources are sometimes located in areas that are regarded as ecologically sensitive so that their production is feared to have a negative local impact on the environment. Oil and gas companies have been active in reducing their so-called footprint. Spills and leakages in transport is another source of pollution in the energy chain. On a global level climate change is the biggest concern.

*Climate change*⁶⁵

Since the Industrial Revolution, the level of CO₂ in the Earth's atmosphere has increased from 280 parts per million (ppm) to 375 ppm today.⁶⁶ The period from 1970 to 2000 accounted for 60 percent of this increase. The average global temperature rose by 0.6 degrees Celsius. Based on expected rates of economic growth, energy consumption and the continuing dominance of fossil fuels – almost 90 percent of energy consumed worldwide – the IEA anticipates another 70 percent increase in CO₂ emissions during the period 2000-2030. In 2025, developing countries are expected to surpass developed countries as the biggest contributors of new CO₂ into the atmosphere.

⁶² Klare, M., *Blood and Oil: How America's thirst for petrol is killing us*, Hamish Hamilton, 2004, pp. 169-173.

⁶³ *Ibid.*, pp. 176-177. The European total was USD 55 billion (50 percent), the US supplied 46 billion (41 percent).

⁶⁴ CIEP, *Study on Energy Supply Security and Geopolitics*, The Hague, 2004, p. 43.

⁶⁵ Based on Perlot, W., *Post-Kyoto and the position of the European Union*, CIEP Briefing Paper number 2, 2005. <http://www.clingendael.nl/ciep>.

⁶⁶ See for more information Annex C.

Within the framework of the Kyoto Protocol, in 1997 industrialised countries and the transition economies – the so-called Annex 1 countries – agreed on a 5.2 percent reduction of their greenhouse gas emissions (compared to 1990 levels) by 2012. The US and Australia decided not to ratify the Protocol. The Bush Administration considered the absence of any obligations to limit emissions by large developing countries, such as China, unfair. The US decision in 2001 placed the fate of the Protocol in Russian hands.⁶⁷ Russia's subsequent agreement to ratify the Protocol appears to have been a package deal, including the much-desired EU support for Russia's bid to join the WTO. The Kyoto Protocol came into effect on 16 February 2005. But Kyoto is only a first small step – one that is necessary to gain experience in effective climate policies, to build international consensus and to develop trust and commitment for the large-scale emission reductions to come. Considering the Protocol's long and difficult road thus far and the apparent problems for countries such as Japan and the Netherlands to meet the Kyoto targets, it is possible that this first small step is already too long of a stride.

Post-Kyoto

The EU has asserted that it wants to limit the rise in temperature to two degrees Celsius in comparison to pre-industrial levels. Based on current climate models, this implies that the average amount of CO₂ emissions in this century needs to stabilise at around 550 ppm. Such an overall target is not yet global policy and shall be part of future negotiations concerning post-Kyoto. The real challenge will be to find consensus between the major actors – the US, EU, China, Russia, India, Japan and Canada – on both their commitments to reduce emissions and the principles upon which these commitments will be premised.

The 2005 European Commission communication, *Winning the battle against global climate change*, proposes a “staged” approach.⁶⁸ It suggests that based on a set of indicators, such as GDP, countries be divided into groups. More economic advanced countries receive absolute reduction targets. In order to decouple economic growth from a rise in CO₂ emissions, intensity targets can be set for developing countries with strong economic growth. Future negotiations between the major actors will probably focus on the indicators and what they imply for each actor. It will be a subject of discussion whether China, or India, or Russia will fall into the group that has to commit to absolute targets, or into another group. In the event that these discussions take place, much will be determined by the results of one actor relative to the other, e.g. the US' stance on its group classification will be informed by the group classification of other actors such as China.

A staged approach leaves room for the “development first” principle, which is part of Kyoto and which must be part of a successor agreement, considering the United Nations Millennium Development Goals (MDGs) for poverty reduction. Developing countries will be assisted in reaching sustainable economic growth, and upon achievement of specific indicators another regime will become applicable, and so forth. The problem lies, again, in determining the thresholds for particular indicators and for when a country should graduate to another regime.⁶⁹ This question is the most pressing for China and India, which in absolute GDP terms rank amongst the top twenty economies of the world, despite their low GDPs per capita.

If it would come into force, a multi-party treaty would still be difficult to implement. What are the consequences if countries do not reach their target? What kinds of mechanisms should be used to ensure such a treaty's enforcement? As with other classical prisoner's dilemmas, actors have an incentive to break the agreement, since implementation means costs without direct and clear benefits. Breaking the agreement enhances the economic competitive position of an actor in comparison to the actors that do comply and is

⁶⁷ The Protocol required ratification by a number of states which together account for at least 55 percent of the 1990 greenhouse gas (GHG) emissions. After the US' “No” this was unachievable without Russia.

⁶⁸ European Commission, *Winning the battle against global climate change*, Brussels, 9.2.2005, COM (2005) 35 final.

⁶⁹ This issue bears resemblance to the graduation issue in trade in the 1970s and 1980s. Within the GATT framework, developing countries were given preferential treatment by the US and Europe. Emerging economies resisted losing their preferential position in trade.

thus an attractive option. The result could be a “tragedy of the commons”; a downward spiral of actors who are tempted to opt out or ignore their commitments, leading to the destruction of the commons, in this case, reaching critical CO₂ levels in the Earth’s atmosphere. A global CO₂ reduction enforcement agency is politically unimaginable. A case in point is the practical difficulties of monitoring and controlling the emissions of, for instance, Russia, China and India. Furthermore, what is to be done if the countries disregarding the post-Kyoto treaty happen to be the US and China – the biggest emitters and also the largest future economic powers? Ultimately, trust will be a crucial element of a multi-party treaty. Levels of trust will be contingent on the outcome of the geopolitical changes currently underway.

Binding or non-binding agreements

The recent Asia-Pacific Partnership on Clean Development and Climate in which the US, China, India, Japan, South-Korea and Australia participate, sidesteps all of the aforementioned problems concerning a new international treaty because it does not formulate any reduction targets. It is a voluntary cooperation agreement with a strong focus on technological developments and as such is in line with the policy of the Bush Administration since 2002. The participation of the two non-ratifying countries and the two largest developing countries makes the agreement far more significant than the text itself, which offers little news. It might lead to an increased interest for global warming as such and strategies to deal with it in the respective capitals. It is possible that this initiative will develop into a complementary path to Kyoto and should be seen as a way to build up trust among these key players. However, this completely different approach to tackling the problem of global warming could also develop into an opposite approach that competes with the Kyoto path. Many other countries might find a non-obligatory treaty without growth restrictions, without clear reduction targets and with the promise of new technologies far more attractive than the strict, complex and mandatory policies connected to the Kyoto-protocol. Although it is still too early to say, the new initiative could signal changes in international cooperation on climate change. At the same time, the attractiveness of the agreement, its non-binding character, is also reason to doubt whether such a technology approach will be effective enough to reduce greenhouse gas emissions.

Final remarks

Despite the fact that global warming is increasingly being recognised as one of the most important problems of the future, and that the possible consequences such as shifting of climate zones and flooding of low countries might even lead to geopolitical shifts in power, the dependency on international cooperation, national interests and differences between countries in economic and political set-up make the chances for “Winning the battle against global climate change” dependent on global geopolitical developments.

3.3.4 Energy poverty

Energy is vital for developed economies to maintain current levels of welfare. It is also vital for developing countries as a precondition for development and economic growth and thereby for reaching higher levels of welfare. Part of the Millennium Goals adopted by the United Nations is to eradicate extreme poverty and hunger. One of two targets to measure progress in achieving this goal was to halve the number of people living on USD 1 a day by 2015. Access to electricity is seen as a key component for increasing welfare levels. Reaching the stipulated millennium goal will therefore require tremendous investments in the electrification of developing countries.⁷⁰ It is in this context that development co-operation policy is related to energy policy-making.⁷¹

Energy poverty reduction

In the period until 2015 electricity should become available to at least 500 million people, at an estimated investment cost of up to 200 billion dollars.⁷² In addition, modern cooking and heating fuels need to re-

⁷⁰ Compare IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 350.

⁷¹ See for more information Annex C.

place traditional biomass consumption and be made available to at least 700 million people by 2015 to reach the USD 1 target.⁷³ Availability of energy will also support reaching other Millennium Goals.⁷⁴ At this moment it is estimated that 1.6 billion people do not have access to electricity. Electrification rates have increased slightly over the decades but improvements have been largely offset by population growth. The number of people without electricity is lower now than in 1990, but that is because of the massive achievements of China. Without China, access to electricity would have decreased in the past three decades.⁷⁵ For the period up to 2030 about 2 billion people will gain access to electricity. However, due to population growth the number of people without electricity will still be 1.4 billion.⁷⁶ Most of these people will live in South Asia and Sub-Saharan Africa.

It is doubtful whether the targets mentioned above will be reached. The goal of reducing energy poverty is faced with traditional development-related problems. First of all, funds are needed to invest in power plants and infrastructure. Development aid is not enough to account for the funds needed and it has to be used for other development goals as well. The willingness of companies to investment billions of dollars is low without a reasonable certain prospect of being able to earn the investment back. Regulatory frameworks and the rule of law in general are largely lacking in most developing countries. Creating a market for electricity, namely customers that can afford to pay electricity bills, is problematic. Illegal tapping of electricity and invoices that are not paid for are major problems in developing countries. The promotion of good governance and the implementation of market forces as called for at the Energy for Development Conference, organised by the Netherlands in Katwijk in December 2004, is easier said than done.⁷⁷ These two issues have been on the development agenda for years. Perhaps the recent attention for Africa and the statements flowing from the G8 make some optimism justified.

Final remarks

The chances for success in reducing energy poverty is highly dependent on the global geopolitical situation in general and the way energy competition will develop in the future. A situation of high prices for oil and natural gas and strong competition either through the market or directly between countries might thwart developing countries in their economic take-off, and the international Johannesburg agenda to make commercial energy available to more people in the world will be difficult to achieve.

3.4. Concluding remarks

In the aftermath of the 1973-74 crisis, there was a difference of opinion among the European countries on how best to realise security of supply. The European economies were particularly hurt by the price increases. The traditional more centrist countries in Europe, such as France and to some extent Italy, preferred to build strong political relations with Arab countries, while more Atlantic-oriented countries, such as the UK, the Netherlands and to a lesser extent Germany, preferred an alliance with the US, which applied a more confrontational approach and emphasised the importance of a global energy market.⁷⁸ This difference in approach is resurfacing today, with to some extent different actors (now also including China and India) leaning towards the political approach.

In today's and tomorrow's energy sector oil and natural gas reserves are increasingly concentrated in but a few countries, and the international political and economic conditions in which oil and natural gas will

⁷² IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 350.

⁷³ Ibid.

⁷⁴ UNDP/ UNDESA/ WEC, *World Energy Assessment - Overview: 2004 Update*, New York, 2004. <http://www.undp.org/energy>.

⁷⁵ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 339.

⁷⁶ Ibid., p. 348.

⁷⁷ Kok, M.T.J. et al., *Conference Paper*, Energy for Development Conference, 12-14 December 2004 and Energy for Development Conference, *Chair's conclusions*, 14 December 2004. <http://www.energyfordevelopment.org>.

⁷⁸ Van der Linde, C. and R. Lefeber, "International Energy Agency Captures the Development of European Community Energy Law", in: *Journal of World Trade*, Vol. 22, No. 5, October 1988.

be traded among producer and consumer countries are unclear. Consumer countries realise their energy security predominantly through their energy policies of which diversification of supply, a diversified energy mix and strategic reserves have been the main elements. But environmental constraints upon a diversified fossil fuel energy mix, the limited availability of commercially viable sustainable energies and a renewed concentration of supply in the future, will reduce the effectiveness of traditional energy policies. Before sustainable energies become widely available it is expected that consumer countries will experience increased competition for supplies. At least to a certain extent that competition will be political competition between countries. This could bring about geopolitical tension among consumer countries, particularly with the ongoing political and economic instabilities in some main producing regions that restrain oil and natural gas production capacity from reaching its full potential. Considerations about security of supply might threaten co-operation on energy-related issues such as global warming and energy poverty.

Many energy outlooks for the future include expected higher demand and discuss the necessary investments, climate change and the reduction of energy poverty. Most of these conclude by stating the necessity for co-operation, pointing to the global interests at stake and the benefits of co-operation. The IEA states in its *World Energy Outlook 2005* that focuses on the Middle East and North Africa (MENA): “The world has an obvious common interest in supporting the pursuit and maintenance of political and social stability and peace in the region.”⁷⁹ It is also possible to write “The world has an obvious common interest in supporting the pursuit and maintenance of political and social stability and peace” – full stop – and that would be a statement worth supporting. But at the same time there is no other conclusion than that despite the common interest the world is not (yet) a place of stability and peace. Whichever factors are the main drivers, common interests fail to result in a common approach.

The search for solutions to international challenges and the eventual choice of strategies lie in the realm of politics. In the present study, actors’ chosen strategies, especially regarding security of energy supply, policies for energy costs efficiency, reduction of greenhouse gas emissions and international co-operation to reduce energy poverty are of importance, and these issues also lie in the realm of politics.

In many energy studies precisely this, the political sphere, lies beyond the subject under research. They may identify the problems, and perhaps point to possibilities to solve them, but treat “politics” in itself as a black box. The WEO 2005 states that “predicting geopolitical developments in MENA is beyond the scope of this book. And yet they will inevitably influence energy market trends, directly and indirectly. Implicitly, our analysis assumes no major change in the geopolitical situation and that MENA countries will achieve some degree of success in addressing the political, economic and security challenges that lie ahead.”⁸⁰

Experiences of the past and developments today indeed suggest that it is imaginable that no major geopolitical changes will occur in the coming twenty years. At the same time, shifts in the political and economic balance of power might bring about a future that is fundamentally different from the present. The next chapter describes geopolitical developments from the Cold War until today and presents three possible futures.

⁷⁹ IEA, *World Energy Outlook 2005; Middle East and North Africa Insights*, Paris, OECD/IEA, p. 61.

⁸⁰ Ibid.

4

Changing geopolitical relations and the impact on the international energy market

The geopolitical landscape has undergone major changes in the past fifteen years. The end of the Cold War and the emergence of new political and economic powers have reshaped the context of the international political and economic relations in the world. These changes have created a new context for global energy markets and energy relations. In a relatively short time span the perspective of deeper globalisation of the energy markets has been replaced by apprehension for a re-politicisation of energy flows among nations. The post-9/11 American foreign policy and the intervention in Iraq, the re-nationalisation of the Russian energy industries, and the bilateral energy relations of China with key producing countries are among the reasons for this apprehension.

Because the bulk of natural gas and oil reserves is in the hands of public – national – energy companies rather than private – international – energy companies, major consuming countries have been rethinking their options to secure energy supplies, particularly since it became clear in the late 1990s that the cautious initiatives of the early 1990s to allow private ownership of oil and gas exploitation had halted.

Understanding of international developments and regional developments in producing regions such as the Middle East, Caspian Sea region, Russia and Africa, helps to assess the risks and challenges of future energy supply and energy diplomacy. The changing geopolitical relations can greatly affect the direction, risk profile and size of energy investments and energy trade flows and also lead to adaptations in governments' energy policies and the business strategies of energy companies. This chapter describes the main geopolitical developments impacting the organisation of the global energy market. It describes two presently visible trends in the international system, one characterised by a focus on economic integration, the other by a focus on state power. Based on these trends it presents three possible future orientations in the international system, each incorporating an energy future.

4.1. The international system prior to 1989

The post World War II international system was, until the beginning of the 1990s, characterised by a bipolar balance of power, consisting of the United States and its allies on the one hand and the Soviet Union and its allies on the other.

A major geopolitical shift was set in motion by the collapse of the Soviet Union in 1991. A new period of uncertainty and asymmetry in power politics was heralded in, changing the geopolitical map of the world. Though the collapse of the Soviet Union made it no longer a capable adversary of the West in the international arena, the geopolitical rivalry that emerged after its collapse has become no less potent a source of instability, both geopolitically and with respect to the world oil and gas market.

The world before 1989 was divided into three groups: the 'market-oriented' group of (Western) countries that had participated in the Bretton Woods system and the more informal monetary system after 1973; a group of countries with planned economies that were fairly isolated from the international market economies; and a large group of mainly developing countries that were not really integrated with either group's economies or political systems. The developing countries had, as a result of their inward-looking development strategies, developed into fairly centralised domestic economies that were only marginally integrated into the international market, usually only by means of one or two primary products. The switch to

more export-oriented development strategies, first by some Asian countries and later also by countries in South America, combined with their integration into the international capital markets when oil revenues were recycled through the Euro-Dollar market in the 1970s, improved their level of economic integration into the world market system. Yet the progress of political, legal, and social integration into the world market system remained weak. Only when developing countries ran into structural economic problems in the 1980s debt crisis and were forced to ask for the assistance of the IMF and World Bank, was a process of (enforced) deeper integration set into motion. Fiscal help was provided under the condition of the liberalisation of their trade and capital accounts, which resulted in more integration into the international market system for these particular developing countries.¹ This often painful adjustment process continued into the 1990s when countries discovered in the 1994 “Tequila” crisis and 1997-98 Asian crisis that major adjustments in the domestic legal, institutional and social sphere were required in order to function properly in the international market system.

The oil-producing countries organised in OPEC combine a state-centred political system with co-operative international politics, with only oil and gas trade and their oil monies as their main connection to the international market. The difference between the oil-consuming developing countries and the oil-producing countries in this period was that producing countries lacked the governance of the IMF and World Bank that through their restructuring programmes stimulated deeper integration into the market system. It can be argued that the producing countries could maintain their state-driven politics after 1973 when they obtained the means to finance their own type of development and thus could not be pressured into making political, legal, institutional and social adjustments. The use of oil as a political weapon in 1973-74 and the subsequent nationalisation in many producing countries of the energy industries further fortified this. Only after 1985-86 when oil prices dropped substantially did some consideration for integration into the market system surface, but never truly led to a restructuring process away from a politically oriented society.

These developments are illustrated by the placement of developing and oil-producing countries across quadrants C and D in figure 4.1, indicating that political/state interests drove their economies and international orientations and, furthermore, that they were only partially integrated into the world political system. Some of the developing countries later shifted from quadrant D towards A. Only a few developing countries have fully made the adjustment and switch to quadrant A. Centrally planned economies have remained firmly positioned in quadrant C.

¹ Van der Linde, C., *The State and the International Oil Market: Competition and the Changing Ownership of Crude Oil Assets*, Boston/Dordrecht, Kluwer Academic Publishers, 2000, Chapter 4.

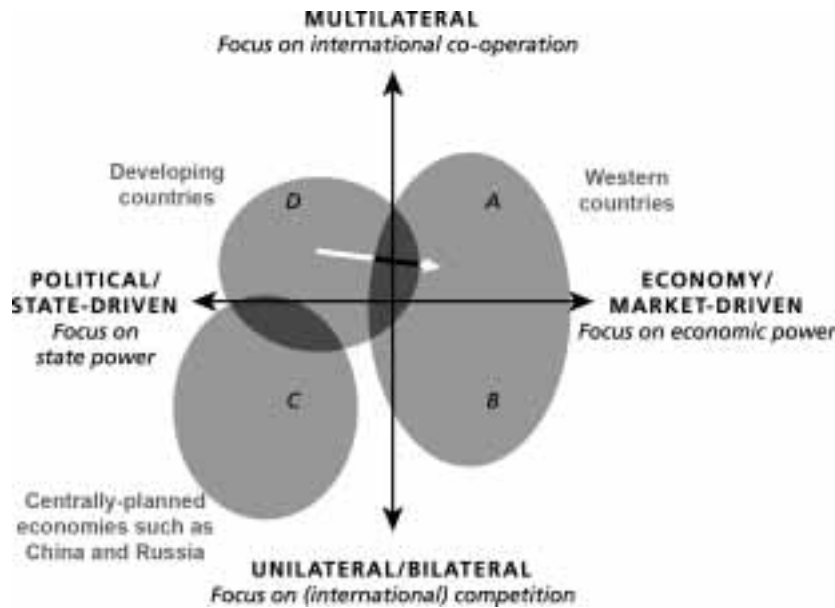


Figure 4.1 The international system prior to 1989

In the period prior to 1989 centrally planned economies were concentrated in quadrant C as a result of their political/state-driven system and were predominantly isolated from the international market economies. The economic exchange with market economies did, however, intensify from the early 1980s onwards in an effort to modernise the planned economy. Some Eastern European countries (members of the Council on Mutual Economic Assistance (CMEA), or “COMECON countries”) began to borrow from Western European banks to finance their modernisation efforts. However, they encountered difficulties in repaying their debts when their exports failed to generate sufficient hard currency. The fact that they were not subjected to the governance system of the IMF led to the institution of the London group, where private lenders negotiated the restructuring of Eastern European debts.

The Soviet Union encountered its own energy crisis in the 1970s and was forced, as the main energy supplier to Eastern European countries, to redesign energy pricing among the CMEA countries. In the new system oil prices were determined on a biennial basis reflecting developments in world oil prices rather than by the previous five-year agreements on price. Moreover, in return for its energy deliveries the Soviet Union wanted the Eastern European countries to invest in the energy (and other) industries in the Soviet Union in order to finance the development of the oil and gas sectors. These investments would also help the Soviet Union to increase its export capacity of oil to the market economies, mainly Western Europe, and launch its gas campaign that would involve large exports of gas to Western Europe. Some integration with the market economies was established in the 1980s, but was very weak in terms of full integration.

Western countries, or the “market-driven” group, are found in quadrants A and B. Their orientation is determined by a combination of their multilateral orientation, their geopolitical role and level of governmental intervention in the economy (the US, UK and France are located in quadrant B, Japan is located on the X-axis, and countries such as Germany, Norway, Sweden and the Netherlands are located in quadrant A). The position of individual countries has changed over time within these two quadrants; with for example France nudged the origin until the early 1980s when the French economy encountered problems with a divergent governmental approach to the economic recession of that time.² From then on, France slowly began to move into quadrant A. Deeper European integration in the second part of the 1980s, with the introduction of the internal market programme to improve economic efficiency and stronger European companies, moved all of the member states further into quadrant A, with France (and Italy) being the closest to the origin.

Although its economic orientation has appeared international, the United States, since the end of WW II, has occupied a place in quadrant B, combining a focus on market principles with a unilateral stance in international politics. The role of the American dollar in the international economy has created an international economic and monetary system in which all other member states of the exchange rate system of the IMF have had to adapt their economic policies to this currency. The United States' economic policies are not focussed on external balances but on its domestic economy. The supposed international orientation of the Bretton Woods exchange rate system was in reality no more than an orientation towards the US dollar. This system ran into trouble in the 1960s when the US balance-of-payments (and US dollar) weakened and other currencies, particularly in Europe, gained strength. European countries were obliged to intervene in the currency markets to maintain their currencies within the fluctuation margins of the Bretton Woods system.

The weakness of the system, caused by the fact that the US dollar could only devalue against gold and not against other currencies, combined with the reluctance of European countries to revalue their currencies and give up their surpluses on external balances, brought the system down in 1971-73. The important role of the dollar continued after 1973 and provided the US with leverage in the international economy. The impact of American economic policies, geared towards the domestic economy, continued to be felt throughout the world after 1973. The low interest rate-high inflation years in the 1970s were, together with the recycling of petro-dollars by international private banks and the hungriness for capital of emerging market, at the root of the debt crisis in the 1980s, while the high interest rate-high dollar policy determined the 1980s' restructuring routes of European and emerging economies alike. The international orientation of the United States in political terms is pragmatic. The US involvement in the United Nations and other international organisations reflects this practical approach.

The end of the Cold War not only marked an end to the struggle between two superpowers, it also relaxed the confrontation between the two political-economical systems. Russia and other states of the former Soviet Union began a process of introducing market principles to their economies and began to open up to the international market economy. The integration of most Eastern European centrally planned economies into the international market system and international institutions happened rapidly. The prospect of integrating into the European Union was enlarged after the Maastricht Treaty was ratified in the early 1990s and negotiations began. In the early 1990s, the Asian countries experienced buoyant economic growth and served as a prime example for other countries of the benefits that could be derived from integration into the world market system. The United States had in the second part of the 1980s impressed other economies with its ability to compete and innovate, after a period of sluggish economic performance in the 1970s.

The achievements of the international market system as compared to those of the centrally planned economy created a general sense of optimism about the one-system future.

4.2. The international system after 1989: Does reality meet expectations?

Before 1989 there was a strong belief within Europe and certain circles in the United States that full integration into the international market economy and international organisations would provide the participating nations with a 'peace-dividend'. For this dividend to materialise, full integration was required and not merely the adoption of export-oriented policies for certain sectors of the economy. Also political, legal and social integration was required in order to merge into the international market system with its political and social institutions.

² Under President Mitterand a Keynesian programme (conjunctural approach with increased government spending to maintain economic growth) was implemented while other European countries embarked on a restructuring programme that included a tighter monetary policy. The result was that France in 1981-82 had to restrict the freedom of capital movement to counter capital flight and defend the French Franc.

Russia and China were expected to integrate gradually into the world market system on their own accord by negotiating WTO participation and for Russia IMF governance. In Russia, Gorbachev's *Glasnost*, or openness, would allow for more public debate, both in the media and within the new parliamentary institutions being set up to replace the former party-dominated state institutions. *Perestroika* entailed both economic and political reforms. A so-called socialist market economy was to be encouraged, and both party and state institutions were to be democratised. China would need more time but would eventually integrate into the market system as well and adopt the rule set. Perhaps because of the break-up of the Former Soviet Union, not much pressure was applied to the political leadership after 'Tiananmen Square'.

Developing countries would continue to integrate into the world market system. The Bretton Woods institutions would make sure that they adopted the rule set and also the necessary domestic economic, political and social restructuring to fully integrate. Countries in South America, Africa and Eurasia were making large efforts to realise integration and reap the benefits of the world markets, much like some Asian countries were in the process of doing. The energy-rich countries around the Caspian Sea and Georgia, for example, were expected to develop their economies, especially their energy sectors with foreign direct investment. No longer a bloc or under tight Soviet control, they would be easier to digest into the world market system than as an integrated whole and thus would secure new energy flows for the market-based system.

Thus, an apparently naive expectation of the future international system drove international relations in the 1990s, at least that is how it appears at the surface. In reality, the end of the Cold War forced governments in Western countries to reposition themselves in the new geopolitical circumstances as much as the countries expected to still integrate into the market-based system. Both the US and the EU understood the strategic importance of shaping this system to their own preferred image. The United States assumed that it would be uncontested as the world's leading political and economic power, while the EU used this historical opportunity to speed up deepening integration and enlargement on the European continent. Its new future size and economic power would enable the EU to step up its significance in the world.

Globalisation, under which name this process was known, represented an economic model of the world, while the political and social implications were never much emphasised by mainstream thinkers and leaders. Globalisation was expected to become the major driving force in international political and economic relations, and economic power within that system would decide the geopolitical make-up of the world with the United States and, to some extent, its western allies in the role of responsible policeman. Globalisation was the common goal that bound the US, EU and other OECD countries in their quest to establish the preferred model for the world, while the underlying geopolitical ambitions were less openly voiced. In an ultimate model, the role of the nation state would diminish in favour of multilateral co-operation and some international system of common governance and economic decision-making would be decentralised to the level of the company. At the same time, it would allow other stakeholders a role as well.³ Placed in our quadrants model the world was assumed to be moving predominantly towards quadrant A, with some important states such as the US remaining in quadrant B.

In figure 4.2, for example, the Eastern European countries were expected to move toward quadrant A, completing that move with accession to the EU, while both China and Russia, given their size and geopolitical importance, were expected to move into quadrant B, initially close to the origin. Developing countries were expected to continue to integrate into the international market system with the ongoing reform of their economies. The new world order, expected to materialise after this transition, would transform political and strategic rivalry into economic rivalry. Reality was different, however.

³ CIEP, *Study on Energy Supply Security and Geopolitics*.

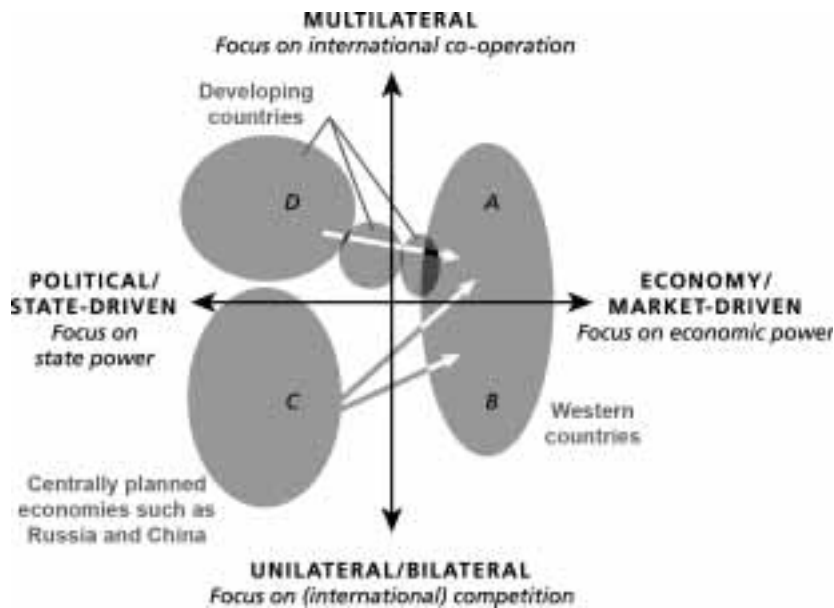


Figure 4.2 Expectation of post-1989 world: integration into international market system

Expectations of internal European integration

The collapse of the bipolar world system had particular consequences for Europe. In 2004, ten new member states, of which eight from behind the Iron Curtain, created a European Union of 25 countries. Initially the Eastern European countries appeared to easily accept the switch in systems and to be prepared to adopt the rule set of the European Union (*Acquis Communautaire*). In retrospect however, it was perhaps telling that they first secured a place in the transatlantic community with their NATO membership. At present, other countries are still in the EU waiting room.⁴ The enlargement of the EU has radically changed its role and function. A discussion about where the boundaries of the EU will be drawn was rekindled with the start of the accession negotiations of Turkey this year and the change of government in Ukraine in 2004. With regard to Russia, the EU has been less clear.

What Western European leaders did not realise, or perhaps were unwilling to disclose in the early 1990s, was that the enlarged Union itself, once the idea of enlargement had taken hold, would or should be less willing to accept the US rule set, and should carve out its own geopolitical position. The combination of enlargement with deepening integration and the establishment of a monetary and economic Union, and the economic size and strength this new Union would represent, must have stimulated some politicians into thinking that it could create a platform for a more independent Europe. Independent from rule setter US in the best case and very influential upon rule setter US in the worst case. The EU would become too large to remain a mere follower. The way in which the Kyoto Protocol negotiations were handled by the EU, in which the EU took a leading role but ultimately could not convince the US to sign the protocol, is a good example of the EU ambitions and limitations in international relations.

The initiative to create a European energy space in the late 1980s, in response to Gorbachev's idea of creating a "European House" in his Glasnost plans, and which later became a more politically watered down version in the European Energy Charter suggested that the EU was making attempts at its own foreign policy towards the Soviet Union. The ambitions of the EU could explain the approach toward Russia throughout the 1990s when the EU actively tried to sell the market design (in energy) to Russia. Russian acceptance of this design for its energy industries would have been a sign that Russia accepted the European (regional) rule set, and the political and economic obstacles to deeper integration of Russia into the

⁴ Bulgaria, Croatia, Rumania and Turkey.

Union would have been removed. The EU operated its foreign policy towards Russia from an unequal position of power, based on the declining economic and political power of Russia in the 1990s. This is but one explanation of the EU approach toward Russia in the 1990s.

Another explanation is more mundane in that the internal energy market could not truly succeed without breaking Gazprom’s monopoly power. The dependence of the EU on Russian gas (and oil) supplies was growing and the organisational structure of the Russian and Algerian gas sector hindered the completion of the internal gas market, with both countries being monopoly suppliers at the EU border. Whatever the explanation for the EU’s approach toward Russia, it is likely that both explanations played a role. The 1990s were a period in which both the EU and Russia had to adapt and digest the dramatically changed situation in Europe. With Russia’s regained economic strength riding on the back of OPEC’s production policy and subsequent rising oil price levels, the strategic importance of the oil and gas sectors for the government has led to making energy a national priority and a crucial element of Russian foreign policy-making.

The EU as an intergovernmental organisation of states was assumed to be moving deeper into quadrant A during the 1990s. But at the same time, in terms of regional power it attempted as a union to move towards quadrant B.

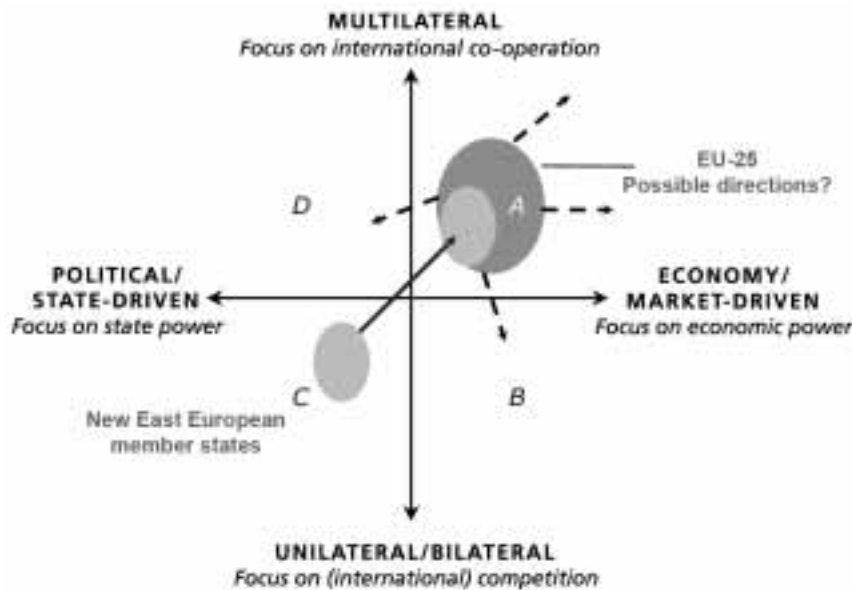


Figure 4.3 Expectation of European integration

More specifically, the expectation was that most Eastern European centrally planned economies would make a full transition into the European market-based system, accepting the rules connected to that system. At the same time, efforts were made to at least integrate Russia’s energy sector into the European market-based system and create the preconditions under which this integration was to take place. The benefits of such a development were clear; unlocking energy flows from Russia and the Caspian Sea region to the EU under market-based conditions would greatly enhance the energy security of the EU and counter the imminent structural dependence on the Middle East.

Expectations of Russian integration into the international market system

The transition route for Russia was less clear than for the Eastern European countries. The deep transition that Poland applied was not suited for a country and economy such as Russia. The Eastern European countries very quickly accepted the economic rule set of Europe and the political rule set of the US to quickly move away from its previous rule setter, Russia. Russia, as the main heir to the Soviet political power in

the world, was at the same time not ready to accept a relatively minor political and strategic role in the international market system. Yet the Russian governments had to initially accept that the economy was weak and needed restructuring. Still, the aim was to maintain as much regional political and economic influence as possible. The weakness of the Russian economy (and some other economies of the former Soviet Union such as Ukraine and Belarus) in the 1990s had reduced the political strength of these countries. As Russia became preoccupied with securing the integrity of the Russian state and not allowing further break-aways to take place, the United States and Europe made the most of this weakness by attempting to lure the energy-rich countries away from Moscow's rule. By the end of the 1990s the competition in the Caspian was awarded the name "the new Great Game" after an earlier period of a power grab in the region.

The privatisation process in Russia led to a massive transfer of state assets, priced far below their market value, to the hands of a few (groups of) entrepreneurs. Particularly in the oil industry the difference between actual and market value at the time of privatisation was very large. The rise in valuation was due more to the oil price increases from 1999 onwards and the increasing value of oil reserves on the stock markets, when oil majors experienced falling replacement ratios, than to entrepreneurship. Only when the owners of oil companies began to voice their views of the political-economic future of Russia and were ready to sell parts of their companies to foreign oil companies, did the controversy between the Putin Presidency and the oil bosses erupt into the open. The controversy about how best to secure an important role for Russia on the world stage was settled in Putin's advantage. The second Putin presidency seems to have discovered the foundation upon which Russia can insist upon its influential role in the international system in which a semi-state/semi-privatised energy sector must match the Russian geopolitical ambitions.

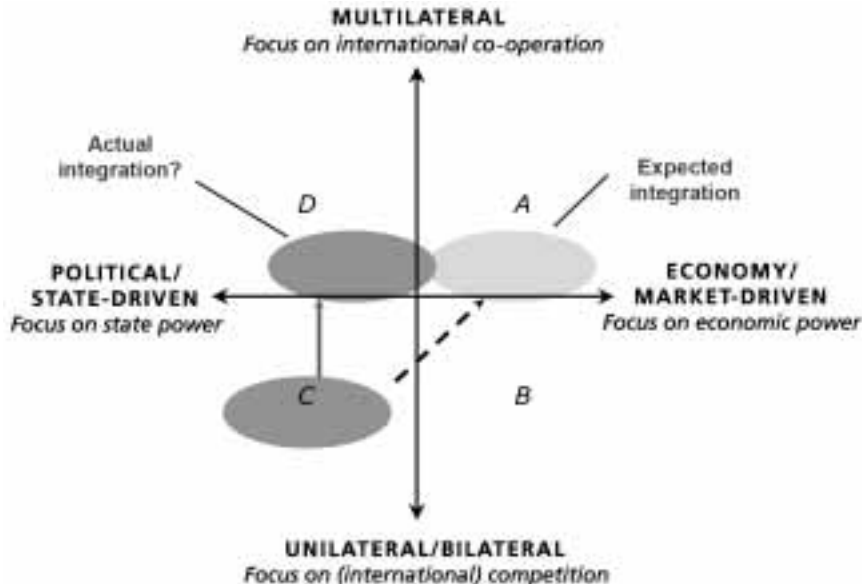


Figure 4.4 Integration or creating alternative mores: Russia

The transition paths of Russia have therefore been different from initial expectations (see figure 4.3) and there has been a change in Russia's foreign orientation toward the energy industry. Russia initially set into motion a transition process that would move it from a centrally planned economy towards a privatised economy (from quadrant C to B). The expectation was that it would then continue to move into quadrant A. But recent developments, particularly in the energy industry, indicate that the move from C to B did not materialise and that President Putin instead is moving his country more in the direction of quadrant D. In this way, Putin has redefined the conditions under which Russia is prepared to integrate into the world (and EU) system and is setting his own rules to realise the strategic goals of the Russian state. Energy has

become an integral part of the Russian foreign policy and a strategic asset in realising its geopolitical ambitions.

Expectations of Chinese integration into the international market system

China was expected to integrate into the world market system by adopting a gradual approach in its transition. Programs of phased economic reform would be continued. Openness to the international market would generate sufficient surplus value to finance the modernisation of the republic. Although through Western eyes, the economic reforms were mostly regarded as capitalism similar to those executed elsewhere, the changes in the “socialism with Chinese characters” (or the Chinese mixed economy) that started under Deng Xiaoping in the late 1970s have been quite unique. Throughout the 1980s and 1990s China seemed to be following a strategy that allowed it to keep its options open, promoting practises that lead to more market integration, but with its own rule set, keeping a firm governmental grip.

China is reluctant to rely on the international market per se but nevertheless integrates parts of its domestic economy into the global economy and politically into multilateral settings. There are a number of institutional and economic factors that may be responsible for this position. China has moved toward quadrant B in parts of its economy, but it has not transformed its political and social make-up and has maintained large parts of its economy in quadrant C (see figure 4.5). Judging by its foreign relations and energy security policy, China is still very much a state-driven society. Moreover, the elite is not entirely confident that a market-based system (a full move into A and B, including making the social and political transitions) will provide China with access to energy and other resources equal to that of the United States and, therefore, it is unwilling to fully rely on this system for the necessary resource security.

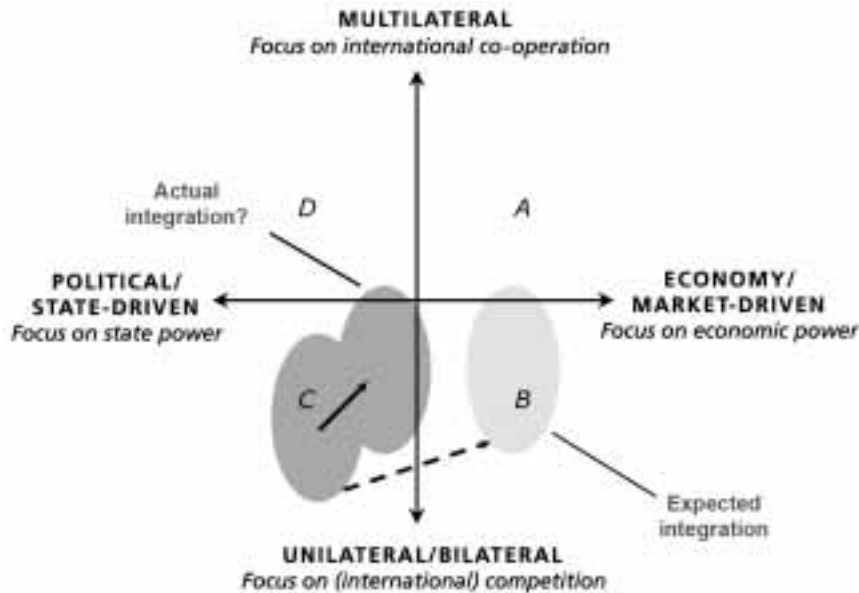


Figure 4.5 Integration or creating alternative mores: China

China is currently actively deepening relations with resource-producing countries whose elites shy away from full integration into the market-based system. Since China still lacks the incentives to integrate fully, its recent agreements with Iran, Venezuela, Zimbabwe and Sudan can be seen as part of a broader attempt to offer these countries an alternative system in which full integration into the economic, social and political sphere of the market-based system is not required. China can certainly offer a market for these countries’ primary products, as well as guarantees of political security and a shield against the pressure of other consumers for full integration in the international market system.

The oil-producing countries

The oil-producing countries are an interesting case in this context (see figure 4.6). Many OPEC member states are only partially integrated into the market-based system, mostly through their oil and oil-related sectors. In the early 1990s it was expected that in order to secure the next generation of oil production capacity, they would have to open up their oil sectors to foreign direct investments. To some extent this has happened, only not in the oil sector but in the gas sector which is capital- and knowledge-intensive and was outside the realm of the state oil companies to develop. The oil-producing countries in the past managed to isolate the foreign presence in their economies from their domestic economies, with the government as recipient of the oil incomes linking the two.

The Western proposal of full integration into the market-based system, including making the social, political and institutional changes, has met with massive reluctance from the ruling elites in the countries around the Persian Gulf. The Iranian ruling (religious) elite fears losing its grip on society, and as a result the defeat of the Islamic Revolution and the ability to develop from within. In Saudi Arabia, the royal family encompasses various political and religious groups. Reformers within the royal family have not been able to push their agenda through due to resistance of conservatives. In Iraq, competing interests of the Shia, Sunni and Kurdish groups might prevent any breakthrough in the reform agenda. Kuwait is developing towards a more liberal society, but successful progress will depend on the developments in neighbouring countries Iran, Iraq and Saudi Arabia.

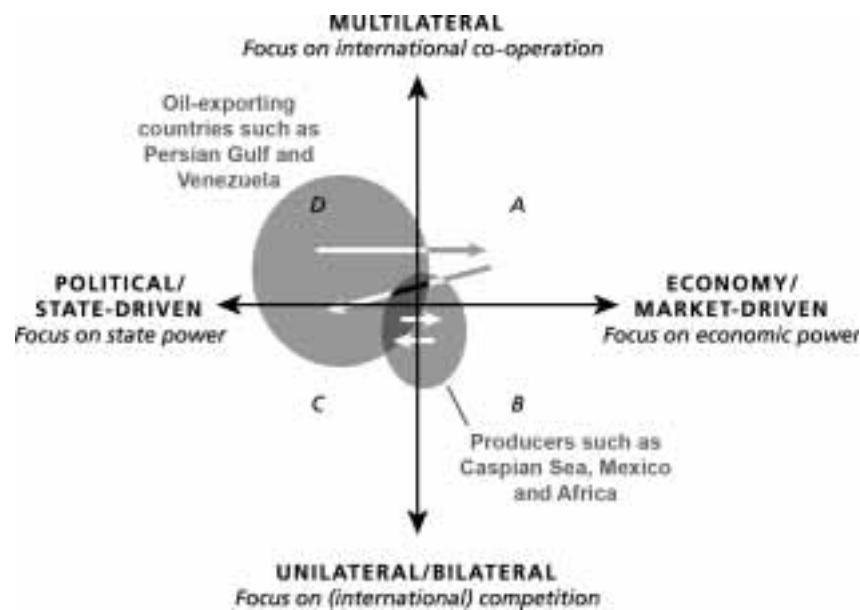


Figure 4.6 The oil-producing countries

Venezuela, meanwhile, has moved away from a path of full integration into the market-based system and retreated into quadrant C. President Hugo Chavez is attempting to rally other countries in Latin America into its politically-driven sphere. In contrast, North African countries are more economically integrated into the market-based system, but socially and politically they still have a long way to go. Their relations with the EU have at least helped them to stay at the margins of this system and not slip away.

The current geopolitical system

Currently, the world is still divided into two types of international systems, one more oriented towards economic efficiency as the leading principle of governance and the other being a system where the effectiveness of national interests promotion prevails. It would be wrong to suggest that both of these systems represent a politically organised group of countries with such an orientation. By definition the state-orient-

ted group is focussed on national interests and has not (yet) gained the national strength to impose its rule set on others. Countries/nations in this orientation are focussed on developing their regional strength first, and from there developing their position as a world player that can influence the international rule set.

Countries/nations in the more economically focussed rule set are also competing to set the rules of the system. The European Union for example was successful in defining its internal economic strategy but failed to complement this strategy with its political and military-strategic counterparts. Even if the troubled 'constitution' would have fixed this impairment, it would have only constituted a small step towards a future political position. The inadequacies of the EU as a political union hinder its ambitions to become a major player in the international system. The preference for negotiated international agreements, such as Kyoto, where large political and economic interests are at stake, are typical. The support from other economically oriented rule followers is understandable because they can exert more influence in negotiations about rule sets than in power plays. For nations that believe that they are or can become rule setters soon, such negotiations reduce their influence if the compromise does not take their ambitions enough into account. On issues in which they realise that they cannot set the rules (yet), a strongly negotiated compromise can be more beneficial until the rules of the game can be changed.

The international system is very much in flux. The perception of the future at the beginning of the 1990s has not materialised (yet). Many trends may even point to the opposite, that the pursuance of national state interests is gaining strength. Yet there are also signs of state-oriented countries where the competition on foreign product markets is part of their strategy. However, the distinct difference with a system of full-blown globalisation is that they make their national interests the main motive for their international activities.

The grounds for this interpretation of national interest-based, or 'weak', globalisation is that the countries adhering to this type of globalisation have little trust in the hegemonic power, the US. This became more apparent after 2001 when the US, for national security reasons, began to more closely define the political, legal and social requirements for integration, i.e. the rule set. Before this date, the US had been less clear about the rule set and about relying on the logic of the market as the main tool to achieve full integration.⁵ The new interpretation of the rule set by the US after 2001, and particularly after the intervention in Iraq in 2003, has motivated some emerging consuming countries, such as China and India, and producing countries to move toward a more state oriented approach of globalisation, since the US is now perceived to be attempting to serve its own national security interests and narrowing the space for alternative interpretations of globalisation that had developed in these emerging countries. The legitimacy of the hegemony of the US became eroded and the rule set was increasingly challenged by other countries.

Contrary to expectation it can be argued that there is a discernible trend in the present international system that shows it to still be characterised by a struggle between two systems of thought and the values and strategies connected to each. In figure 4.7 this situation is represented by two overlapping orientations, with China, Russia and the producing countries located in the quadrants C and D and the OECD countries in quadrants A and B.

⁵ Van der Linde, C., *Energie in een Veranderende Wereld (Energy is a Changing World)*, Inaugural Lecture, Groningen University, 22 November 2005, <http://www.clingendael.nl/ciep>.

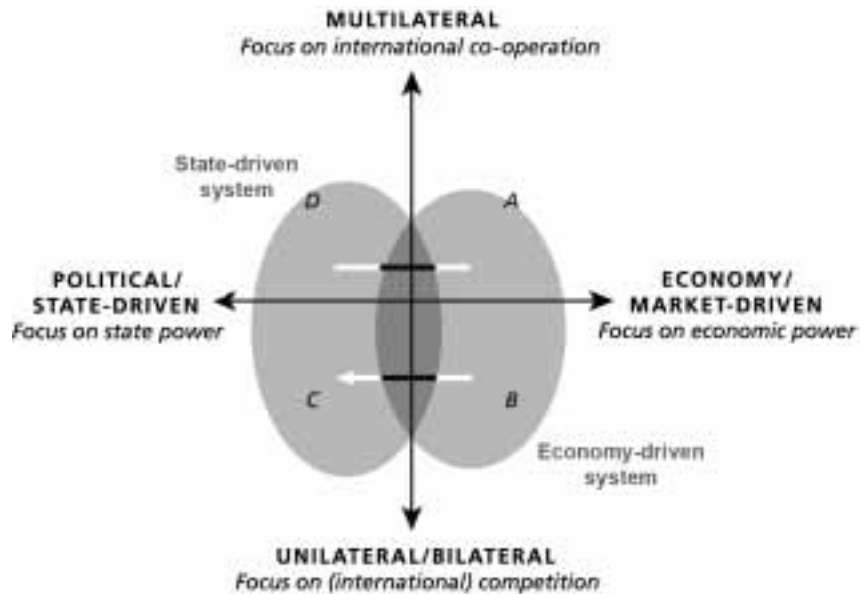


Figure 4.7 Two orientations?

Despite distinct differences in positions in the international system, the charting of actors in the axes-model leads to the conclusion that a majority of the rule setting and of the most important rule-following actors are positioned relatively close to each other and can be seen as being part of one of the two groups. The struggle between the two systems has not yet been resolved, as adherents to the market-based system have not been able to convince the politically/state-driven actors with the right incentives to become and stay fully integrated, whilst antagonists of the market-based system have not felt compelled to convince the proponents otherwise.

This struggle between systems has significant implications for the organisation of the international energy market. Fossil fuels will remain important elements in the energy mix for at least 30-40 years, supplying between 80 percent and 90 percent of total energy consumed. Renewable energy sources and nuclear energy will have an impact only in the sense that they may to some extent decrease countries' import dependency. Given the current and projected levels of import dependence on fossil fuels, it is obvious that for major consuming countries, energy self-sufficiency will not be possible for the first half of the century, if ever.

As energy demand continues to grow, the question arises as to within what type of international system energy sources will be traded and how competition will be shaped. Will we see a scramble for resources in a world with an orientation towards political strategic manoeuvring? The next section presents three possible geopolitical landscapes and their impacts on the organisation of the energy market.

4.3. Three futures

The Cold War period was characterised by a bipolar system. Today the question is what, if anything, will replace this? Will it be a (single) market-based system in which eventually all economies are fully integrated and accept the rules of that game, thus being an expansion of the regime that developed after the Cold War; will it be a politically/state driven system to which even traditional market-based states want to adhere and which considers national interests, identities and security; or will there be a new type of bipolar system, in which the formerly planned economies and other partially integrated countries create their own political/ state driven economic and political system *alongside* the market-based system, with renewed interest for ideology?

Figure 4.7 above depicts the two main orientations that are present in today’s international political and economic system. It depicts the uncertain outcome that leaves room for a movement toward the left or the right side of the vertical axis or up or down the horizontal axis. This uncertainty leads to the consideration of three possible future developments in the international system and their subsequent implications for energy futures.

4.3.1 Future #1: The Expanded Functioning Core⁶

Figure 4.8 depicts the first energy future embedded in an international system dominated by a market-based orientation. In this international system states differ in the choices they make in governing their international relations and, however few, there are still states that do not wish to adhere to a market-based system and shun full integration with the rest of the world. The name of this future has been borrowed from Thomas Barnett’s notion of the “Functioning Core” of globalisation.⁷ In the present study the ‘Expanded Functioning Core’ stands for an orientation towards more connectedness, more and deeper integration of economies, societies and institutions.

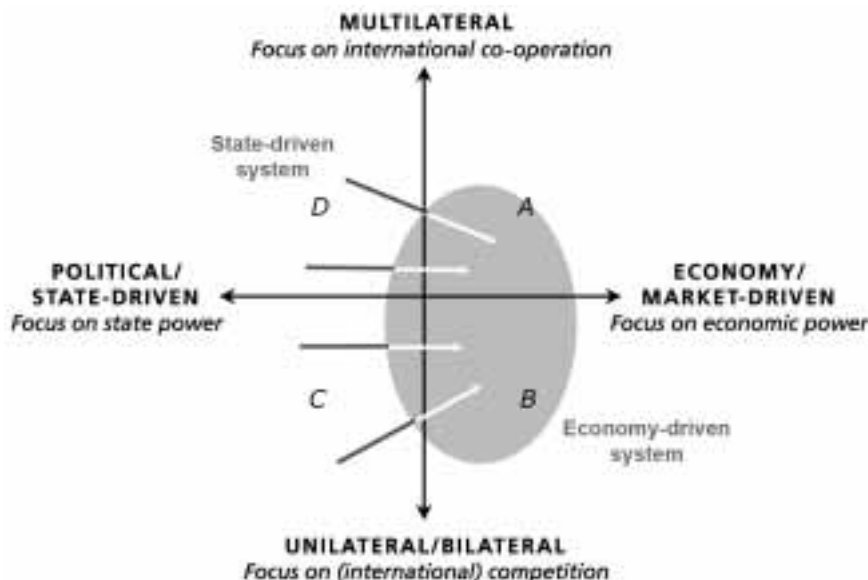


Figure 4.8 The Expanded Functioning Core

General

In this first future scenario, the ‘weak’ globalisation apparent from the 1990s onward has given way to the ‘strong’ globalisation envisioned in the late 1980s. There is, generally speaking, trust in the merits of free market principles and of full integration into the international system as the best way to serve the national interests. A combination of conviction in the market-based system, an improved image of the US and increased openness to developing countries of Western economies, have enabled proponents of the free

⁶ This future is comparable to the *Markets and Institutions storyline* as described in CIEP’s *Study on Energy Supply Security and Geopolitics* and to the *Open Doors scenario* of the *Shell Global Scenarios to 2025*, Shell International limited, 2005 (see box 4.1).

⁷ Barnett, T.P.M., *The Pentagon’s New Map*, New York, Putnam, 2003, and interview with the author in *Epoca*, December 2004. The Functioning Core of globalisation consists of roughly two-thirds of the global population. In the Core is included the countries where globalisation can be seen in network connectivity, financial transactions, liberal media flows etc. According to Barnett regions not included in the Functioning Core are, by most definitions, made up of those countries that are least connected to the global economy. Typically, many of them export one or two raw materials but very little manufactured goods, for example. Barnett calls these regions the Non-Integrating Gap.

market and of multilateral governance to defend and promote their principles. Although reluctant at first, important opponents of an integrated and globalised market (China, Russia and India) have changed their stance to benefit more fully from the economic possibilities the market system has to offer. This, however, required the stimulation of the US and the EU offering greater say in several multilateral institutions and other means to increase trust among the main actors. Other countries mostly follow the trend towards further integration, but for some, reforms have led to socially and politically difficult circumstances. Still, the successful isolation of rogue states, in combination with offering incentives for better performances and adherence to international institutions and international regimes, has brought developing countries on board, including most energy producing countries.

Rule setters and rule followers

The US is the most important rule setter in this future, in part by having the support of two of the most important rule followers, the E.U. and Japan. The structural deficits in the balance of payments and the government budget have eased since the US managed to convince countries such as China that a much needed appreciation of the undervalued Yuan is important for world economic stability. In return for China's revision of its exchange rate policy, remaining barriers to trade have been lifted and mutual investments in each others' economies are accepted. The US recognises that the best way of convincing others of the market system is by putting it to practise. Economic ties between the US, China and, to a lesser extent, Russia, India and Brazil have increased. The combination of strengthening ties and allowing more multilateral governance – stemming from the idea that this serves the interests of the US better, since it diminishes mistrust and increases the possibilities of the market – gives the US very strong cards to convince other actors to avoid unnecessary strong political confrontations. The basic principle of “What is good for me is good for all, so all should be convinced” at first raised eyebrows but is gradually winning over the other actors.⁸

The EU has closely followed its Atlantic partner. Global prosperity has enabled the EU to integrate further internally. However, the problematic political integration of the EU member states remains a stumbling block in its international relations. Implementing the Lisbon agenda, incorporating new member states and reforming the Union has taken up a lot of time and effort, and the international situation has lessened the immediate need for becoming a political unitary actor. Despite stability concerns - a primary motive for its strategic political and state positioning in the early 2000s - Russia's focus on the OECD countries, and increasingly also on Japan, has necessitated Russia to open its economy. The energy sector remains mostly the prerogative of the Russian state, but foreign direct investments flow towards Russia's energy sector even though they have to agree to a 49 percent minority share. However, the Russian energy sector is highly profitable and as Russian companies begin to invest in consumer markets, security of supply and demand worries are eased.

It has taken China time, but it recognises that it needs continued economic growth, if only to keep the internal status quo and the Chinese population happy, and that it therefore cannot afford to be left out of the market system. China becomes recognised internationally as an important player. In return China has to accept that some of the problems that were considered matters of national security in the early 2000s are resolved multilaterally and not necessarily in their favour. These concessions are difficult to accept for large parts of the population, since nationalism has become an important part of the country's identity. Furthermore, China has to become more transparent so that its own claim to a peaceful rise can be verified by the other actors. Other countries follow suit, but only as far as their policy space allows.

⁸ The US has managed to reach the twofold policy goal formulated by Brzezinski: “To perpetuate America's won dominant position for at least a generation and preferably longer still; and to create a geopolitical framework that can absorb the inevitable shocks and strains of social-political change while evolving into the geopolitical core of shared responsibility for peaceful global management.” Brzezinski, Z.K., *The Grand Chessboard: American Primacy and Its Geostrategic Imperatives*, New York, BasisBooks, 1997, p. 215.

Multilateral institutions

Multilateral institutions are important in 2020. The United Nations have overcome the crisis of the early 2000s and is the prime organisation that governs multilateral relations. Still, the role of the UN remains limited and has not developed into a form of global governance. In his work *Global Political Economy*, Gilpin presents an argument as to why global governance is difficult to constitute: “Governance at any level, whether national or international, must rest on shared beliefs, cultural values, and, most of all, a common identity. Unfortunately, we do not live in a global civic culture, and few common values unite all the peoples of the world. Identity and loyalties are still national or even local, ethnic, and racial. As more and more nations are formed, national identities are becoming more numerous and, in some cases, more intense. (...) Modern states are highly self-centred and are seldom concerned with the welfare of other peoples. (...) Under such circumstances, talk of substituting global governance for the primacy of nation states is in vain. The best for which one can hope is that the major powers, in their own self-interest as well as that of the world in general, will cooperate to fashion a more stable and humane international political and economic order.”⁹

The most important organisation in world economic order is the WTO. The role of the World Bank and IMF have not significantly changed in twenty years. Regional free trade agreements such as NAFTA are also important. In energy, the International Energy Forum (IEF) is an important platform for furthering the dialogue between consumer and producer countries, to ease difficulties between producers and consumers and to share costs on security of supply and demand measures. OPEC and the IEA still exist, but now more as a joint knowledge platform for oil and gas producers and consumers to facilitate the discussion in the IEF and in the discussions on global warming and other environmental issues. The IEA cooperates with China and India, uniting the consumer countries.

Security of energy supplies

The energy sector is organised according to market principles. Security of supply is achieved through the international oil market, although crisis mechanisms are still required for dealing with supply calamities. It is of no importance whether investments in equity are made by private or public companies, as long as their production becomes available on the international market, and the producing companies pay resource taxes to the host governments. Oil and gas molecules become ‘denationalised’. And although not all countries become natural allies, there is a shared rule set and a shared orientation on economic efficiency and market principles. Under a market-based system, buyers and sellers have equal possibilities for executing their respective power and reaping their rewards. Security of supply is considered to be an international concern, since a supply disruption could impact consumer economies substantially. However, security of demand is also an international concern, and major efforts are undertaken to improve the transparency of markets. Producer governments can thus better judge the required investment levels and balance them with their interest in oil and gas conservation.

Middle East OPEC countries receive special attention from the rest of the world. With the exception of Iraq, the countries around the Gulf have witnessed the ‘demographic time-bomb’ come to ignition. The young population of the 1990s has aged to mid-thirties to forties and has been successful in constituting political change. The long-awaited political and social reforms are implemented, and the governments are assisted in creating more jobs in these fundamentally capital- and energy-intensive economies. The newly chosen leaders have rapidly re-opened the energy sector and have thus attracted sufficient capital to modernise the energy industry. Having little experience in political reform or in market-based economic policy-making, however, makes the transition period worrisome. The redistribution of gains and economic rents has created a new elite and this new elite exerts political power not dissimilar to the previous regimes. Insecurity among the population at large is growing, as the rapid process of substituting elites has not been supported by institutional and social reform.¹⁰ The situation leads to renewed instability in se-

⁹ Gilpin, R., *Global Political Economy: Understanding the international economic order*, p. 402.

¹⁰ CIEP, *Study on Energy Supply Security and Geopolitics*, p. 93.

veral of the countries, finding new grounds for anti-Western movements and radical Islamic identities. The possibility of a democratically elected, more inward-looking Islamic government worries several Western countries; at the same time the international system has little to no room for ideologically based interventions. In a few other countries, leaders have been elected who are only partially concerned with democratic principles.¹¹ Intervening in these semi-authoritarian states is not an option, since the international community cannot find a common ground for action.

Instability in certain producer countries and along transit routes implies that security of transport routes remains important. As much as possible, security is implemented through multilateral agreements such as UNCLOS. The US and NATO, although no longer considered the police forces of the world, provide support for countries that request it.

Energy costs

Energy costs determine to some extent the competitive position of countries and companies on the global market. Governments are therefore concerned about the question of whether the energy prices within their territory do not weaken their economic position.

Climate change

The problem of global warming is taken seriously, but the problem-solving capacity of countries remains problematic. The focus on market principles has made the market for renewables difficult. Being competitive on the world market is very important and the different actors are hesitant to make costly investments without similar programmes being implemented by other actors. Having the most ambitious programme and a reduction target towards 2050, the EU is the most successful in reducing greenhouse gas emissions. The US and China, the two largest emitters, opt for non-binding targets, although for different reasons. High sums go to innovation, but the world is still waiting for the technological breakthroughs that will make the difference.

Energy poverty

Following the concerns about security generated by poverty and political instability, the UN Millennium Goals are considered to be of great importance. Many developing countries are actively supported to integrate into the international system. However, the sometimes rapid reforms cause social tensions to increase. Full integration takes time, and the support of developed countries and large developing countries is intermittent. Focussing on energy efficiency and open markets complicates making energy available in large parts of Africa and Asia, especially in countries with poor governance.

4.3.2 Future #2: The Expanded Splendid Isolation¹²

Another energy future is conceivable. It is one in which the market-based system has been largely replaced or is being replaced by an international system driven by state-centred forces and the strategic political interests of states. Figure 4.9 illustrates an international system in which states are located predominantly left of the vertical axis, indicating that societies, economies and political systems are largely governed by strategic choices made by political elites. The name of this orientation has been borrowed from British 19th century foreign policy.¹³ In the present study '*Expanded Splendid Isolation*' stands for an orientation driven by national interests culminating in the reluctance to enter into demanding alliances or to cede power or control over anything regarded as a vital strategic asset, such as access to energy resources.

¹¹ See Ottoway, M., *Democracy challenged: the rise of semi-authoritarianism*, Washington D.C., Carnegie Endowment for International Peace, 2003. Ottoway describes Egypt, Azerbaijan, Venezuela, Senegal and Croatia as examples of varieties of semi-authoritarianism.

¹² This future is comparable to the *Regions and Empires storyline* as described in CIEP's *Study on Energy Supply Security and Geopolitics* and to the *Flags scenario* of the *Shell Global Scenarios to 2025*, Shell International Limited, 2005 (see box 4.1).

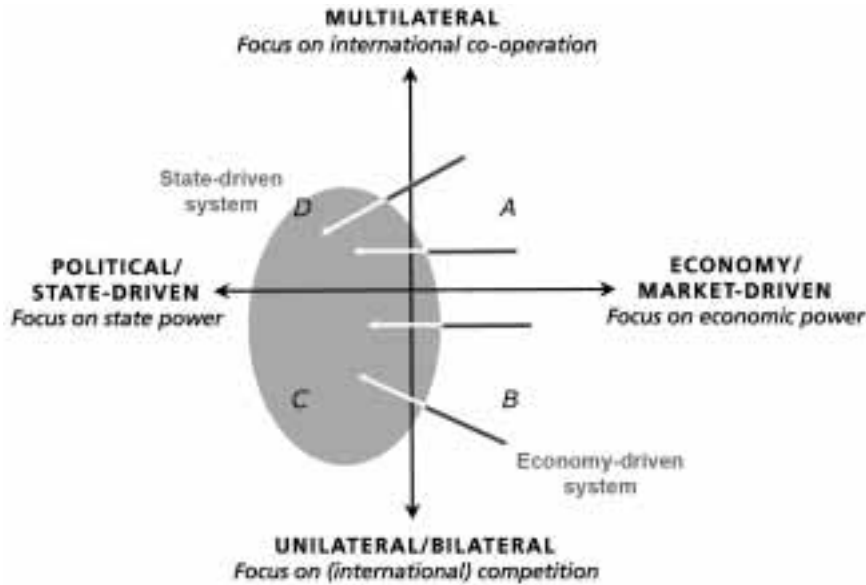


Figure 4.9 Expanded Splendid Isolation

General

The terrorist attacks of 2001 and subsequent events have led to feelings of insecurity and anxiety in numerous Western countries. The demand for more government protection and the new awareness of national identities have led to an increased state focus in Western countries. Moreover, the US also perceives a stronger future threat from the rise of China. In its attempts to reaffirm its position as a superpower, the legitimacy of the US as a hegemony dwindles.

China remains reluctant to provide transparency on military spending and numerous other areas. National interests rule its international economic and political activities. In particular, the way in which resources are secured for the Chinese economy is motivated by strategic state interests, and resource flows are generated by state companies. Despite China’s membership in organisations such as the WTO, the accompanying rules that go with membership are clearly interpreted to fit the national interests. The threat of sanctions weakens when companies continue to do business with China and other countries. The sheer size of the potential market and the promise to produce in low-cost countries compensates for the lack of abiding by the trade and other economic rules.

The final component for this system is that Russia is using energy to secure a solid position for the country internationally. The consequence is that the state-oriented policies of the late 1990s have solidified and have proved rewarding to its executors. In an example of a classical prisoner’s dilemma in which the important international actors are engaged in an action-reaction game, the international system increasingly becomes characterised by bilateral agreements. The result is that international regimes and institutions have lost their meaning and functions, while all major and medium powers have succumbed to the new rule set. Individual states question their own politics and strategies, wondering that since everybody else is putting national interests at the top of their priority list, why shouldn’t they do the same? In the 2020s

¹³ Charmley, J., *Splendid Isolation?: Britain, the Balance of Power and the Origins of the First World War*, London, Hodder & Stoughton, 1999. Splendid Isolation refers to the foreign policy pursued by Britain during the late 19th century, under the premierships of Benjamin Disraeli and the Marquess of Salisbury. Their policy was characterised by a reluctance to enter into permanent European alliances or commitments with other Great Powers and by an increase in the importance given to British colonies, protectorates and dependencies overseas. This occurred side by side with the development of informal empire through the use of sphere of influence and client states dominated by, but not directly governed by, Britain.

the situation in the world is similar to the early 20th century, with great power rivalry and a scramble for resources. Political tension is high and conflicts among the actors are more likely than in recent decades. Economic integration is regional by definition, and every ambitious power is working to increase its own sphere of influence.

Rule setters and rule followers

China is the rule setter in this orientation. Not so much because of the active promotion of its strategy, but rather because the country adheres to its strategy despite the combination of push and pull factors in international political and economic relations that would otherwise push China in the opposite direction. Because of its steadfastness, China is actually the perceived rule setter.

China has continued its successes in increasing welfare for its population on its own political terms. The developments in geopolitical relations in the first decade of the twenty-first century have shown that countries, rather than simply accepting the recipe for economic globalisation, more than in the twentieth century want to sustain their own route towards development, in which the national political, economical and social orientation is preserved. A group of successful autocratic regimes that have emerged on the world scene are refuting the belief long held by Western countries that economic growth is almost automatically followed by democracy.¹⁴ This expectation that democracy follows economic growth is based on the notion that the growing group of schooled middle classes will demand more political rights. More and more autocratic regimes have discovered that by limiting certain public rights,¹⁵ such as political rights, human rights, freedom of the press and access to higher education, it is possible to reduce the ability of opposition groups to organise themselves. Importantly, the coordination of economic growth is not hampered by the limitation of these public rights. Elites in other countries, particularly in oil- and gas-producing countries, are charmed by the success of the autocratic regimes because it allows them to create economic growth without upsetting the balance of political power or the social construct of their countries. Trading with countries such as China has the added advantage for producer countries that, in addition to access to its attractive market, political, legal and social reforms are not conditional for deeper economic relations. The Chinese approach to international relations exemplifies its growing soft power.

In line with the increasing focus on national security issues since 9/11 2001, the US views “China as facing a ‘strategic crossroads’” and has “started to rebalance its policy closer to the containment end of the spectrum in order to ‘mitigate against’ China’s internal evolution ‘taking a bad turn’”.¹⁶ This response to China’s policies cements the relation between the two as strategic rivals. The US, used to major power politics, quickly implements the new national security-inspired rule set and continues its autonomous politics in ever looser alignment with traditional partners. Since the US had a much more powerful starting point than China, the US remains the sole super power, although its ability to set the rules on political, legal, economic and social reforms has been eroded by the soft power of other countries.

After a period of erosion of its economic and political role in international relations in the 1990s, Russia has regained its strength after strategic (energy) choices were made under the Putin presidency. Energy is elevated as a strategic asset in its foreign policy-making. With the help of energy it has befriended China and Japan, while also playing the energy card in its relations with the EU.

The EU is confronted with the considerable problem of aligning its member states under a common foreign and energy policy towards Russia, the US and China. Some member states are very dependent on Russian energy supplies and want to diversify, against economic logic, to other suppliers. Also, these pre-

¹⁴ Bueno de Mesquita, B. and G.W. Downs, “Development and Democracy”, in: *Foreign Affairs*, volume 84, No. 5, 2005, pp. 78-79.

¹⁵ Ibid. p. 82. See also Ottoway, M., *Democracy challenged: the rise of semi-authoritarianism*.

¹⁶ Small, A., *Preventing the Next Cold War: A View from Beijing*, London, Foreign Policy Centre, 2005. <http://www.fpc.org.uk>.

dominantly Eastern European member states are wary of intensifying relations with Russia after a period in which they have successfully loosened their ties with Russia by integrating into the Western European economy. Since the member states have asymmetric interests and risks in the energy sector with regards to Russia and the Middle East and North Africa, and different approaches to strategic foreign relations with the US, Russia and China, it has been impossible to formulate a cohesive foreign and energy policy at the EU level. The development of anything ‘common’ – a common foreign and security policy, a common defence policy or a common security of supply policy – is further away than ever, and national approaches also dominate in the EU. The lack of political integration within the EU initially inhibits the elevation of the EU towards becoming a more important political player, but two strong coalitions within the EU compensate for the lack of unitary responses. One coalition is strongly oriented towards forging an alliance with Russia, while the other coalition remains focussed on the US. Japan and South Korea try to manoeuvre more independently from the US, but their weariness of China makes a security alliance with the US necessary. India has similar choices to make.

Thus, China pulls all actors towards quadrants C and D. As all actors become more politically oriented and every move instigates another move, the main actors in the system will not come any closer to each other. Social and political tension and global problems are most likely in this future.

Multilateral organisations

Although multilateral organisations have become less important, the U.N. and related institutions still function as institutions for global stability and as a platform for discussing solutions to simmering regional conflicts. The U.N. is sidelined but for on major security issues, and the WTO, IMF and the World Bank have lost their importance. Crucial discussions about international security and international economic relations take place within the G-8, where ‘issue-coalitions’ determine results. The International Energy Agency still exists, but is weakened by the political differences among its member countries, which might block emergency decision making. Although OPEC potentially has strong cards due to tight energy markets, the differences between the OPEC member countries and the pressure on them from different important consuming countries has diminished OPEC’s political and economic role as a unitary actor. The IEF can no longer live up to its promise of the 1990s and early 2000s since the dialogue has been taken hostage by certain key producers and consumers.

Security of energy supplies

Security of energy supply is largely achieved through long-term contracts and political agreements between consumer and producer countries in the same coalition. Consumer states that have not concluded such contracts have to pay a higher price for their energy security, either by buying remaining fossil fuels on the international/regional market or by developing more expensive alternatives such as nuclear power generation. Part of the conviction in the *Expanded Splendid Isolation* future is not only having enough energy, but also the ability to prevent other competing states from satisfying their energy needs, as part of the geopolitical rivalry. Security of supply is always to some extent a zero-sum game. Resources can only be consumed once. Zero-sum has now become a policy objective, or to put it differently, strategic ‘beggar thy neighbour’ policies increase the relative strength of actors vis-à-vis other actors.

Earmarked production through bilateral contracts does not enter the international market. Non-earmarked production is limited and constitutes a seller’s market. Many producer countries are part of the sphere of influence of major actors, and those who are not are under constant pressure to show allegiance. Producer countries have become the hot spot for geopolitical rivalry. For producer countries this has obvious benefits, but there are also downsides in terms of national stability. Security of demand is guaranteed and excess production can be sold for high prices. At the same time, the pressure coming from the great powers to take their interests into account limits the room to manoeuvre. Despite the increased relative power of producer countries, the primary control of the international system lies with the major consumer countries, with the possible exception of Russia. In this energy future, the majority of molecules is nationalised or renationalised.

If producing countries are the hot spots of geopolitics, the Middle East and especially five countries around the Persian Gulf are the absolute focal point of attention. These countries need to find a balance between providing their population with prosperity, dealing with the quest for identity within their own borders, working on their own national interests and providing their consumer partners with a stable flow of energy at reasonable prices. This proves to be a difficult challenge. The reforms called for in several UNDP reports in the early 2000s have almost completely stopped.¹⁷ Elites maintain strong control over oil revenues and are fortified in maintaining power by their success in creating greater welfare for potential political opponents and denying them access to the rights that help them organise opposition. In effect, allied consumer countries uphold reactionary powers in producer countries. Few consumer countries are verbally critical about political and societal reform issues. To some extent the instability has become less, since repression is more potent. At the same time, feelings of discontent are omnipresent in the region, providing a breeding ground for all kinds of radical elements, and disruptions of unrest occur regularly. Concerns that such a disruption will lead to rebellion with consequences for the supply of oil and natural gas leads to enhanced security co-operation between consumer and producer countries. The large and, in some cases very young, populations in Saudi Arabia, Iran and Iraq become increasingly frustrated by the lack of possibilities to determine future developments within their countries, and abhor the controlled access to public rights. The strong nationalistic sentiments of the elites increasingly clash with the young of minority groups, resulting in tighter security.

Security

Security of production and transport infrastructure is high on the political agenda. Through bilateral agreements, major consumer countries and allies try to protect their energy interests in producer and transit countries. Such a military presence, or at least military cooperation, to some extent only aggravates certain problems within countries and leads to violent reactions against certain consumer countries. On top of that it heightens concern by other countries, which feel forced to mobilise their forces or engage in the strategic positioning of troops. This rivalry is especially strong between the US and China. The lack of an international framework to tackle nuclear proliferation, the disappearance of most of the non-proliferation regimes and the use of nuclear energy in the energy mix of numerous countries to bring more security to their energy sectors, means increased concerns for security and the spread of nuclear weapons.

Costs

Reasonable prices are still an important concern for consumer countries. However, the cost issue is less important than the access to resources and the security of supply. In a world where access is not a given and is largely determined by strategic manoeuvring, price is not the first issue. Military presence and security measures add to the costs. These costs are not internalised in energy prices, however. Hurting other economies by limiting access increases a country's relative strength and has benefits of its own. For developing countries that are not strategically positioned the rivalry over energy is especially harmful. They have difficulty obtaining sufficient oil, unless they perform strategic tasks for one of the main rivals or the producers. The Millennium agenda has been sacrificed for the new agendas of the main powers.

Climate change

Global warming is a concern for many countries, and there is awareness that in the long run it could become a threat to national security. In the short term, however, there are more pressing issues that need to be addressed, including energy security. Coal, as a result, has (re)gained importance in some large consuming countries as a dominant fuel in the energy mix. At the same time, the push for renewables and nuclear energy in order to decrease import dependency, decreases greenhouse gas emissions.

Energy poverty

The reduction of energy poverty as a means to increase stability in certain countries and regions is still important. Aid and means to provide energy to remote areas and poor people are given from a strategic

¹⁷ UNDP, *Human Arab Development Report*, 2002, 2003, 2004, <http://www.rbas.undp.org>.

perspective. If energy poverty reduction serves the interests of major actors it will be supported, but it is not important as a goal in and of itself.

4.3.3 Future #3: No Core, No Gap¹⁸

A third energy future is conceivable, one in which the market-based system and the state-centred system coexist. Figure 4.10 illustrates an international system in which states are located in two separate drop-shaped areas, indicating that one group of states is fully economically, politically and institutionally integrated whereas in the other group of states the societies, economies and political systems are largely governed by strategic choices made by political elites. Each of the two knows its stark sceptics that nonetheless are clearly part of that group; these are located at the edges of each drop. The name of this orientation has been borrowed from Barnett’s notions of a “Functioning Core” of globalisation and a “Non-Integrating Gap.”¹⁹ In the present study *No Core, No Gap* stands for a future in which two systems, which by most accepted definitions of wealth or political maturity are not equal, but nonetheless have equal *raison d’être*, co-exist and compete with one another.

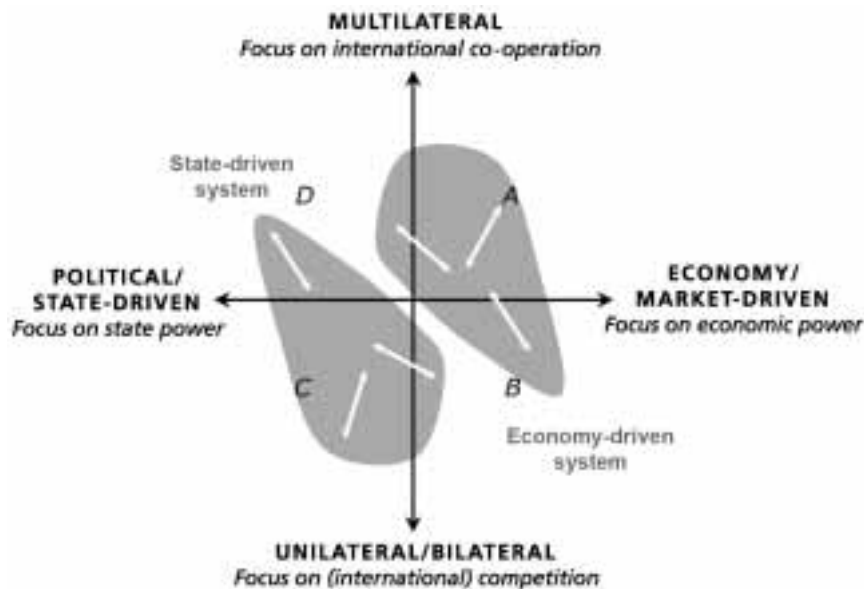


Figure 4.10 No Core, No Gap

General

The rapid growth of China in the early 2000s gripped the attention of policy makers, especially in the year 2005. Without even having seen a single flash point, such as Taiwan, come to ignition, but with a couple of catalysts such as Chinese naval capacity build-up and US attempts to contain the Chinese rise to global power, it is possible to say that already 2005 was the start of a new Cold War.²⁰ Since the first decade of the twenty-first century American global manoeuvring has been identified by many countries as “America’s liberal imperium.”²¹ With the US only befriending those states that accepted its rule set, China has

¹⁸ This future is similar to the *Low Trust Globalisation scenario* of the *Shell Global Scenarios to 2025*, Shell International Limited, 2005 (see box 4.1).

¹⁹ See footnote 7.

²⁰ Small, A., *Preventing the Next Cold War: A View from Beijing*, London, Foreign Policy Centre, 2005, p. 5. <http://www.fpc.org.uk>.

²¹ Kaplan, R.D., “How We Would Fight China”, in: *Atlantic Monthly*, June 2005, p. 1, www.theatlantic.com. The full sentence is: “Pulsing with consumer and martial energy, and boasting a peasantry that, unlike others in history, is overwhelmingly literate, China constitutes the principal conventional threat to America’s liberal imperium.”

had the benefit of being able to pursue its own interests, which has been more than welcome for many states tired of the American hegemony.²²

What is more, the Chinese see the US democratisation efforts as part of further hegemonic strategies and the call for reforms within China as an attempt by the US to weaken the country. Consequently, countries confronted with similar calls for reforms can count on sympathy from China. Over the years that sympathy has changed to outspoken support. To increase national identity and to find a counterweight to the American doctrine of liberal democracies and markets, since 2005 China has reintroduced some of the Marxist ideology to their country. The refocusing on socialist ideals to underpin social stability has assisted in making an important connection with some Latin American countries, especially Venezuela, more natural. Anti-neo-liberal movements in Latin America have halted further integration with America. With the US still heavily present at the Chinese borders, China has become present in America's 'back yard'. With the differences between the two countries deepening, increasingly along ideological lines or along lines of two very different rule sets, other countries, especially important actors such as the EU and Russia, are forced to choose one way or the other.

These developments have led to a future in which a group of countries continues its economic, political and institutional integration with the revived belief in the general advantages of deep globalisation. At the same time a number of major states that, although prudently, had initially begun integration with the industrialised group of countries when thought opportune, are now bringing this process to a halt and organising their own system. The mistrust among the two orientations about the other's behaviour and intentions crossed a certain threshold in 2005, "rapidly setting in train the actions that start to validate those doubts and transforming pragmatism into a fear and an ideology of conflict that starts to overtake rational calculation".²³

Rule setters and rule followers

The two key actors are the US and China, both rule setters within their own systems and together the rule setters who initiated these developments, although neither one of them sought this result. The two separate systems are governed by two separate rule sets. There is no dominant force, no orientation capable of attracting all. The most important rule setter in the market-based system is the US; the OECD countries are the main followers. The US has become more unilateral and in doing so 'pulls' the other actors in its wake, also those positioned in quadrant A, towards quadrant B. The most prominent rule setter in the state-centred system is China; its most outspoken supporters are developing countries, including a number of producing countries convinced that the advantages of bilateral contracts and agreements offer more security than the free market can.

There are several important rule-following actors that determine the extent of influence of both systems. Confronted with a system that also opposes many of the liberal ideals of the European countries, several member-states of the EU are among the staunchest allies of the US; especially the UK and the former Eastern European countries. France and Germany struggle with positioning themselves within the American-led group, both for their own reasons. France has reservations for historical and cultural reasons, while Germany is very concerned about its relations with Russia. Russia is a hybrid force, spanning itself between the two systems. Yet, in its approaches it should be considered part of the Chinese-led group, although rivalry exists between the two countries. Just as Germany is a reluctant ally in one system, Russia is a reluctant ally in the other. Not willing to enter the American rule set, it is not willing to accept the Chinese rule set completely, either. India is in a position similar to Russia's. Still, although not reliable allies of China, India and Russia are both part of the state-driven system.

²² Ibid.

²³ Small, A., *Preventing the Next Cold War: A View from Beijing*, London, Foreign Policy Centre, 2005, p.11.

Multilateral institutions

Multilateral institutions witness a substantial loss of meaning in their delegated powers as it becomes increasingly difficult for the two systems of thought to come to decision-making in international and/or trans-national matters. The UN and the Security Council become more subject to power politics between the two systems and mirror the interplay of actors and the ways they respond to each other. Should the US choose a more unilateral path and withdraw largely from decision-making processes in international settings - or explicitly go around it as it did in the early 2000s - this might offer precisely the right incentive and opportunity for rule setters in the opposing system (China, and to a lesser extent India) to fill the gap left by the US. In this way China's self-proclaimed co-operative multilateralism would eventually materialise. This in turn may cause the state-driven system to move slightly upwards towards quadrant D. The existence of other multilateral institutions, such as the WTO, IMF and the World Bank is sustained by the market-based system. The IEA is the energy agency for the market-based system. OPEC exists only in name, since the different producer states are part of different alliances.

Security of energy supplies

In this energy future the international energy market is characterised by a hybrid of free trade mechanisms combined with politically agreed-upon contracts. The market is continuously in flux as producing countries respond to the political actions of the major consumer countries.

In general the countries in the economy-driven system prefer free energy trade and continue to uphold this. Outspoken strategic measures, taken especially by the US and a number of major EU member states that appear to circumvent free trade, harms trust in the guarantees that the free market can offer and increases the call for earmarked production. However, a significant part of the energy production has already been earmarked for countries in the state-driven system. The mix of a liberalised market in, and between, some parts of the world and strongly controlled markets in others upholds an insecure energy market, in which tightness offers ample opportunity for disruptions. Producing countries become increasingly politically active, seeking security of demand as well as new resources. To this end competition amongst producing countries increases as much as it does between consumer countries. Russia is an important supplier of energy to Europe and also to China. As such, it is one of the few countries that is not forced to make an absolute choice for one of the systems, and is allowed its hybrid position. Renewables, nuclear energy and coal are important for countries in both systems.

Rule setters in both systems attempt to protect and maintain sufficient supply lines. This is being done within a political and economic rule set. Both systems accept that certain producer countries belong to one system or the other. However the potential change of a country's allegiance can trigger forceful reactions and potential military intervention (the "freeing of molecules").

Costs

Cost efficiency is more important in the market-based system than in the state-driven system. However, the availability of resources on the international market (in the market-based system) and access to resources (in the state-driven system) is a higher priority. Security, military pressure, the restructuring of funds and assistance, etc., lead to higher costs in securing supplies. Renewables and nuclear energy are in both systems promoted to enhance security of supply. Costs play a role, however, in the trade flows between the two systems.

Climate change

Climate change is on the agenda, but concerns for costs on the one hand and short-term national security concerns on the other imply that it is hard to keep it a policy priority. China remains a strong coal-based economy, partly to control its security of supply risks. Coal also becomes more important for the US and the EU, but only to the extent that coal is competitive with the available other resources. Due to the reduced availability of oil and gas, coal, renewables and nuclear energy gain competitiveness. Local pollution

is a more important driver for environmental policies than the long-term problem of global warming and caps the use of coal.

Energy poverty

An important issue is the enhancement of stability in developing countries. Development aid is strategically placed and goes to countries with similar allegiances or to countries that might be triggered to become part of either of the two systems. Poverty reduction and consequently energy poverty reduction is not a goal in itself, although both sides have the intention of showing the world that their system is the best approach.

4.4. Conclusion

The changing geopolitical relations that characterise today's international system will lead to an unknown and unpredictable future. The impact these changing relations have on the international energy market is obviously high as energy itself is subject of geopolitical manoeuvring. At present it is possible to identify both a tendency towards the increased politicisation of energy-related economic policy and a preference for more uni-/bilateral strategic decision-making, as well as more commitment to the working of the free market, international problem-solving through multilateral institutions and deeper integration. Whether this increased commitment is more lip-service than the signs of an upcoming paradigm shift is difficult to say.

The type of decision-making on a number of particular non-energy related and energy-related problems will certainly offer a direction. Think of how problem-solving on disputes over e.g. the South and East China Seas, on Iran, on Iraq, on Taiwan and on North-Korea may determine the balance of power in the international system. Every issue is in itself a starting point for a future, or at least points in a certain direction, and much will depend on the rule setters within each system and within each future, but also on the strength of alliances, contracts, agreements and trust within each sphere.

With respect to trade issues it can be argued that if the US were to convince China that its interests are best served by the market-based system and that access to resources is best guaranteed by this system, and China at the same time proves that it is committed to a peaceful rise by offering transparency to Western countries, the Expanded Functioning Core could become the dominant system (and China would move toward quadrants A and B in the diagram). But if China is not convinced or does not offer transparency, fuelling mistrust, and instead focuses on national interests, rivalry between the US and China will grow and may create sufficient incentive for more strategic functioning by all actors, including Russia, the EU (or its member states), India and Japan, and thus for development towards a system of *Expanded Splendid Isolation*.

Similarly, with respect to security issues it can be argued that if both the US and China display more 'hawk' politics there may be a general shift towards *Expanded Splendid Isolation*. In the case that the US relaxes its unilateralism and its containment policy and thus offers room for China to do the same, there may be a shift towards Expanded Functioning Core. If, however, neither of the rule setters opt for complementing rather than mirroring political actions, with China presenting itself as an alternative to the American dominance and also putting more emphasis on cultural and ideological differences, the rivalry between China and the US may become a rivalry between systems, forcing the other actors to choose between them. In this case there might be a move towards No Core, No Gap.

The type of decision-making on a number of particularly energy-related issues will determine a certain direction for the future, whatever that future may be. The responses of the rule setters and main rule followers, especially to security of supply issues and to the economic and political climate in important producing countries, in particular Russia, Iran, Iraq and Venezuela, will keep the balance of power in the international system in constant flux and might bring about a threshold after which one of the three future becomes the most likely.

Box 4.1 Shell Global Scenarios to 2025^a**The future business environment: trends, trade-offs and choices**

In early July 2005 Shell launched its new *Global Scenarios to 2025*. Although approach and focus differs from the one presented here, the analysis leads to similar results. Shell's new analytical framework has for the first time in the history of Shell scenario writing led to three Global Scenarios.

The first scenario is called *Low Trust Globalisation*. This is a legalistic world where the emphasis is on security and efficiency, even if at the expense of social cohesion: the absence of market solutions to the crisis of security and trust, rapid regulatory change, overlapping jurisdictions and conflicting laws lead to intrusive checks and controls, encouraging short-term portfolio optimisation and vertical integration. Institutional discontinuities limit cross-border economic integration. Complying with fast-evolving rules and managing complex risks are challenges.

The second, *Open Doors*, is a pragmatic world that emphasises social cohesion and efficiency, with the market providing "built-in" solutions to the crises of security and trust: "Built-in" security and compliance certification, regulatory harmonisation, mutual recognition, independent media, voluntary best-practice codes, and close links between investors and civil society encourage cross-border integration and virtual value chains. Networking skills and superior reputation management are essential.

The third, called *Flags*, is a dogmatic world where security and community values are emphasised at the expense of efficiency: zero-sum games, dogmatic approaches, regulatory fragmentation, and national preferences, conflicts over values and religion give insiders an advantage and put a brake on globalisation. Gated communities, patronage and national standards exacerbate fragmentation, and call for careful country-risk management."^b

a. Van der Veer, J., Introduction to Shell Global Scenarios to 2025, speech delivered at the launch of the scenarios, Royal Institute for International Affairs (Chatham House), London, 6 June 2005; and Shell, *Global Scenarios to 2025*, Shell International Limited, 2005, pp. 11-13.

b. Ibid.

The main actors today

Box 4.2 to box 4.21 offer descriptions of the main actors in terms of their positions in the quadrants model

Box 4.2 United States

The United States is situated in quadrant B. The United States is fully committed to market principles and economic efficiency with a unilateral orientation. This is not likely to change. The US has a clear orientation towards a system of Functioning Core and is willing to use any means necessary to promote this system, including military force. Other countries with a similar orientation do not automatically share this willingness. The current Bush administration has added a call for democratisation and good governance. Countries that for years managed to satisfy oil demand without adapting to the global economic system are now confronted with the demand to adapt not only the economic principles but also a democratic state organisation. The combination with a religious revival in America from which Bush gets a lot of support in exchange for more conservative Christian policy, makes the ideological double demand (economise, democratise) suspicious and hard to digest for many countries across the world, not only in the many Islamic producer countries but also in the more secular and not outspoken ideological European states.

Box 4.3 China

China keeps a close eye on the United States. Despite a growing integration into international markets and seemingly the intention of more regional and global cooperation, in energy terms China's policy is directed at Splendid Isolation. The broader economic and political developments will not change this. It depends on the stands of the US, Japan, Russia and India as to whether China will develop more in the direction of quadrant B or stays firmly rooted in C. China will for this period be on the strategic defence and avoid open conflict or too much tension between China and the US.

Box 4.4 Japan

Heavily dependent on the US for its national security, the policy space of Japan is to a certain extent decided in Washington. Japan has given up on the course to secure equity in oil producing countries and is trusting in the market. Japan is in energy terms a quadrant A country, although the central organisation of the country through cultural ties puts it close to the centre of the model. Strategies of China and, to a lesser extent, India may trigger Japan to apply more political tools and other energy-related policy tools to secure supply. This is only possible in so far the US is willing to allow it, since it can undermine the Functioning Core. Japan faces a dilemma if the US and China become too opposed to each other. In the end Japan is likely to follow the US.

Box 4.5 India

India is located on the state- and politics-oriented axis, but is reluctantly also becoming more involved in world markets. In energy terms, India has adopted a classical equity approach and prefers nationalised molecules above denationalised. India's international energy approach is typical of quadrant C. India considers itself still a weak power but is on the rise. It still has an ambivalent attitude toward globalisation and economic integration, but is now reaping their first benefits. Since it considers itself to be a weak power, India wants to create a multi-polar world and avoid becoming too closely tied to only one power. However, India is worried about China and feels more secure with a strong America nearby. With America it shares certain values about state organisation, and India still has strong bonds with the UK. All in all, in terms of crisis India will turn to the US, and is moving towards but is not part of the Functioning Core.

Box 4.6 Russia

Russia is in quadrant C and is moving in direction of D. Of course Russia has made great progress in reforms and introduction of market principles. However, especially in the energy sector, which is so important to the Russian government, it views the energy endowments as national property to be applied in support of the state. Its long period as the leader of the communist world and the strong traditions in strategic thinking and economic planning may be the most important motive in Russia's policy; it would be a vital mistake to underestimate the strength of these traditions and their influence on Russia's global outlook. Russia's policy is mostly of a Splendid Isolation orientation, but does not openly oppose Functioning Core since that could hurt its long-term strategic interests.

Box 4.7 United Kingdom

The UK is oriented towards market principles. It is in many ways the long time ally of the US. In energy it trusts in the international market and is willing to secure equity for the market in corporation with the US. The UK is also committed to more international solidarity, reducing poverty and fighting global warming, at least under the direction of New Labour. The UK is willing to work in the context of the EU, but it is unlikely to choose the EU over the US. The UK is more US-oriented than EU-oriented. The UK has a strong focus on Functioning Core.

Box 4.8 France

France has never been a convinced supporter of market principles or even multilateralism. Although in the past decade progress was made in implementing market principles in the EU context, France was certainly never a front-runner. It is in quadrant A, but very close to the centre, since its energy policy has Splendid Isolation elements with national, state-owned champions such as EdF. It also comes to the fore in historical perspective. France tried to promote the nationalisation of molecules in the wake of the first energy crisis in 1973 instead of tying the bonds between consumer countries. It also negotiated production deals with Iraq under Saddam.

Box 4.9 Germany

Germany is a difficult actor to place in the quadrants. It does not seem completely convinced of an economic efficiency nor a political orientation. Both its energy policy and its industry policy seems to underline this. Protectionism for the coal sector and support for major Germany companies, including the strategy to create national champions to ready the country for the integrated European market, are tendencies indicating towards c and d. For oil and natural gas it is more willing to trust in markets, although bilateral deals with Russia, passing by other members of the EU, might indicate a shift. Germany is a multilateral-oriented country, but only to a limited extent. Germany is in quadrant A, but close to the middle of the quadrants model, making no clear choice for any international order.

Box 4.10 The Netherlands

As a small country, the Netherlands is a weak power. Its biggest strength is its economic power, a power derived from trade and an open economy. The Netherlands is in quadrant A and remains there. It has implemented or is implementing market principles in many sectors of its own economy, including the energy sector. The Netherlands wants to enhance the role of economic efficiency around the world, but is ambivalent to the level of commitment. It has a good relationship with the US, but at the same time is a supporter of further European integration. In the case that it would need to make a choice it is more likely to choose the transatlantic alliance before Europe. The Netherlands is fully committed to expanding the Functioning Core.

Box 4.11 European Union

The EU has made great progress in increasing the economic circumstances of its member states and providing stability and peace in Europe. Its members, however, do not have the same economic and global political outlook. They differ in the ideas of 'best practices'. The more the countries have become politically integrated, the more the differences have become apparent. In a world that might demand a clear position of the EU as a unitary actor, these differences will be a continuous source of conflict, making further political integration and a common foreign and security policy very difficult. In energy terms the EU is, due to asymmetrical interests, not merely a sum of its member states; it is less than that. The EU as a whole is in quadrant A. As a multilateral organisation, which it will remain for the foreseeable future, it is unable to move to a bilateral quadrant.

Producer countries

Box 4.12 Saudi Arabia

Saudi Arabia is the biggest net oil exporter and will remain so for years to come. It has a strong focus on national interests leading economic choices. The production of Saudi Arabia is conducted by Saudi-Aramco, a national oil company which in reserves and production is the biggest oil company in the world. Saudi Arabia has been in strategic alliance with the United States for decades. It is a pragmatic alliance; it has secured the Saudi oil for the international market and brought stability to the Persian Gulf and security for Saudi Arabia. It is not an alliance based on mutual values. Saudi Arabia is certainly not a country of PBWO. Its alliance with the US has not made the oil exclusive for the US; of the ten to eleven million barrels of oil produced, only one and half million went to the US. The relationship is under pressure for a couple of reasons: The Saudi mixture of modern economic and state institutions with traditional, partly religious institutions have led to a volatile social situation in which most of the 9/11 terrorists could flourish. The Bush administration's emphasis on democratisation and ideology has put further pressure on the relationship. The lack of transparency and openness of the Saudi oil sector is in the current tight market difficult to accept. The growing importance of China for Saudi Arabia might in the long run change its reliance on the US, but this is not likely in the foreseeable future.

Box 4.13 Iraq

The Iraq under Saddam Hussein could be placed in quadrant C. Its ties with several state-oriented governments made it a threat to the United States. Iraq did not adhere to the rules of the game. The invasion of the United States should not be understood in terms of a classical power play or a dash to control the oil; the US was 'freeing' the oil molecules to let them flow again to the international oil market. It was a matter of supporting market integration by all necessary means. Many countries that can benefit from the US and UK invasion of Iraq, basically all consuming countries and especially the consumer countries that rely on the international market for their supplies, did not support the US. Other countries, such as the UK, Japan and the NL, did support the US, especially in the phase to rebuild Iraq. Iraq is still in disarray. In the current situation it is unclear whether the new regime will prefer a state or a market orientation and whether the US intervention has truly made the Iraqi production available for the world market again.

Box 4.14 Iran

Iran is in quadrant C and remains there. It prefers direct dealings with other governments and sees the energy resources as a tool in manoeuvring in its conflict with the US. The contacts, contracts and deals with several major consumer countries outside the functioning core break its international isolation. Despite foreign private investment in the energy sector, most of its contracts are with other governments. In international politics Iran is an object of intense diplomacy by the US and EU. Under the 1996 Iran-Libya Sanction Act (ILSA), which has been renewed in 2001, the US prohibits US companies or their foreign subsidiaries to conduct business in Iran. Recently Iran's nuclear ambitions have led to disputes with the US and the EU. Without actually causing a diplomatic crisis, Iran's unilateral stance becomes highly visible in showing that Iran will not bow to the US or the EU. With its considerable oil reserves and vast natural gas reserves Iran is of major importance to the global energy sector. Knowing very well that it cannot boost its production without private sector investment, Iran is carefully allowing more foreign direct investment in the energy sector, in most cases in a co-operation agreement with an NOC. However, the Ministry of Petroleum keeps a very close grip on developments in the energy sector and in selecting foreign oil companies. The election of a conservative president might lead to the closing of the energy sector to foreign investors. Since being elected to office, president Mahmoud Ahmadinejad has put more emphasis on the nuclear energy programme, made threatening statements about Israel and has called back many diplomats who had been appointed under the former Iranian President Mohammad Khatami, a reformer.

Box 4.15 Kuwait and United Arab Emirates

Both countries are much more committed to market principles than the other Persian Gulf Countries; they are active in promoting the private sector, decreasing the role of the government and opening up their markets to foreign direct investments. UAE is the centre for most activities of multinationals in the Middle East as well as an important tourist area. Both countries have a good relation with the United States; Kuwait also a strong military bond. Both countries are in B, relatively close to the middle of the model. Neither country is considered a risk nor will either suddenly change its strategy.

Box 4.16 Azerbaijan/ Kazakhstan/ Turkmenistan

These are three potentially important countries, since these three countries provide additional reserves and production to delay further dependence on the Persian Gulf at least for a certain period of time. The struggle for the reserves is not complete yet. The fact that they are all landlocked means that heavy investments are necessary. Some investments might bring the production to the international markets; other options are stronger ties with Russia, India and China. Azerbaijan is furthest along in integration into the international system and is located in quadrant B. Kazakhstan is also open to foreign investments and participation, but the regime is in many ways more state-oriented. Kazakhstan cannot be counted on automatically to produce oil for the international market. Turkmenistan is in quadrant C and will remain there.

Box 4.17 Algeria

A significant hydrocarbons producer and exporter, Algeria is gradually opening up its energy sector. By holding licensing rounds for foreign development of oil and natural gas reserves Algeria has experienced a significant influx of foreign investment in recent years. As it is still in need of additional foreign capital for the expansion of its production, Algeria is expected to continue developing an open economic sector. Algeria has an Association Agreement with the EU and a co-operation treaty with the European Free Trade Association (EFTA). Algeria is currently pursuing membership of the WTO and, based on the latest IMF assessment, is making progress in meeting the criteria for membership. In short, Algeria demonstrates a shift towards a multilaterally-orientated stance combined with a preference for integration into the international market. It must be said, however, that the country still has to overcome the years of civil war and political unrest and will for the medium-term future be occupied with internal reform.

Box 4.18 Libya

A major oil exporter, particularly to Europe, Libya is making efforts to return to the international community as a respectable member. Isolated by US and UN sanctions issued between the late 1980s and early 1990s, Libya has recently relatively successfully transformed its stance. In 2003 the UN lifted its sanctions after Libya's declaration to rid itself of Weapons of Mass Destruction, to comply with the Nuclear Non-Proliferation Treaty and to take responsibility for the Lockerbie case. In 2004 the US eased its sanctions and later formally resumed its diplomatic relations. Also in 2004 Libya's President Gaddafi invested in political relations with the European Union and met with the European Commission. Libya shows signs of wanting to reform its economy and to open up its energy sector to private investment. In part unexplored or at least under-explored, Libya is an attractive country for foreign investment. It plans to reduce the state's direct role in the economy and seek more foreign company assistance to increase the country's hydrocarbons production capacity. State planning and a highly individual self-positioning are still visible.

Box 4.19 Nigeria and other West-African states

The West-African producer countries are largely open to foreign investments. All major international oil companies are active in the area. Increasingly, market principles are implemented in economic sectors, most notably in Nigeria. Domestic problems with possible consequences for investments and security of energy supplies remain a major risk in the region in the foreseeable future.

Box 4.20 Sudan

In terms of total production and future potential, Sudan is not really important as a producer country. The strong presence of Chinese and Indian companies make it interesting, however, especially since the international community has not been able to come to an agreement on how to deal with Sudan because of oil interests. The government of the North can be placed in quadrant C. How it will develop now with the peace agreement in the South remains to be seen. Major policy shifts are not to be expected. The indirect support of China and India to the government of the North may lead to a shift away from these countries to other consumer countries, such as the United States and the Netherlands, who both have been active in the peace process. Whether peace can be secured for a longer period of time is doubtful.

Box 4.21 Venezuela

Venezuela in the nineties became more and more a quadrant B country; a trend coming from the management of PdVSA. Under Chavez the situation has changed rapidly. Under Chavez Venezuela is a quadrant C country. This reversal stems from the considerable social unrest in the country and the strong opposition to a neo-liberal political agenda by large poor groups, something that can be seen across Latin America. Chavez tries to build a regional coalition and is committed to international cooperation to reach a multi-polar world. Venezuela might become a country in quadrant D in the future. However, Chavez has a very bad relationship with the US that has already led to a remark by Chavez that stopping the export of oil to the US is a possibility. The introduction of China as a trading and investment partner increasingly makes Venezuela a country that does not play by the rules. Future intervention by the US should not be excluded as a possibility, depending on broader geopolitical developments.

5

Three energy futures and the EU

The EU and its member states are an integrated part of the current geopolitical changes taking place and as such also help shape the international energy markets. In the previous chapter the analysis was predominantly focussed on the role of the US and China as rule setters and their impact on energy relations among consumer countries and between producer and consumer countries. It showed how a shift in orientation towards the political economy in general, also has a substantial impact on the international energy sector. This in turn can impact the volume and direction of oil and gas flows in the world and also the flows that Europe will be able to attract.

This chapter offers a more comprehensive discussion of the EU's possible position and specifically of possibilities for the EU's energy policy in each of the three presented futures up to 2020. As an introduction, a brief outline of the current EU energy policy-making and its general policy space will be presented. Next, the state of affairs of the EU in the different futures is discussed. In the three identified futures, the EU mostly follows the mores imposed by other actors. For the sake of argument this discussion is followed by a description of the EU's capacity – *irrespective* of the future – to set or even impose its own rules on other actors. The final section concludes.

5.1. External EU energy policy and the EU's policy space

Policy-making processes in the EU and its member states take place at different levels and by different actors. In the present study special attention is devoted to the EU's energy policy and particularly to the EU's external energy policy. As discussed in previous chapters, a consumer country's energy policy can be analysed in terms of three main goals – security of energy supply, market and price efficiency, and the environment. The EU member states pursue these goals individually, as well as collectively, albeit at different levels of competence.

From the early 1960s onward, the EU's energy policy has incrementally developed, but still leaves areas underdeveloped.¹ The European Commission plays an active role in developing the EU's energy policy. Recently, most activities have been developed under the competition chapters of the *Acquis Communautaire*, e.g. with the introduction of the internal gas and electricity market. The Green Paper *Towards a European strategy for the security of energy supply* is currently an important foundation for security of supply policy-making.² Despite the Commission's intentions and arguments presented in the Green Paper for a common energy security of supply policy, the EU member states have remained reluctant to give up their national sovereignty in this part of energy policy.

The EU's *Acquis* includes the three priorities of energy policy, although at different levels of competence. Its stockholding measures serve the objective of security of supply in which the European Commission "participates in the work of the IEA".³ The process of liberalisation of the gas and electricity markets serves the price efficiency objective. The Emission Trading Scheme serves the environmental objective.

¹ See for a historic overview of the EU energy policy: Lefeber, R. and C. Van der Linde, "Europese integratie vergt een energie(k) beleid", in: *Sociaal-Economische Wetgeving*, June 1987.

² European Commission, *Towards a European strategy for the security of energy supply*.

³ Citation from the IEA website, <http://www.iea.org>. "The EU directives are complementary to the IEA measures. Most EU countries are members of the IEA, except for some of the new member states. Legally, the IEA predominate European directives".

Furthermore, the EU has developed a number of regional co-operation projects such as Euromed, BAS-REC and NORDIC in which energy plays a vital role.⁴ As for nation states, the three priorities of policy-makers do not necessarily match or concur with one another. This also implies that, like ministries at the national level, the Directorates-General can at times pursue conflicting policy-agendas and opinions, depending on their particular task. Subsequently, energy policy at the EU-level is also in Brussels subject to inter-departmental politics, for example between Directorate-General Transport and Energy (DG TREN) and Directorate-General Competition (DG COMP).

For the purpose of the present study it is useful to make a distinction between the objectives of EU energy policy that are primarily aimed at the internal EU matters and those that are aimed at influencing energy matters outside the EU. The completion of the internal energy market and of greenhouse gas emissions reductions, for example, are objectives that are part of the EU's internal energy policy agenda, but also affect the world outside the EU.⁵

The growing EU energy import dependence has elevated the importance of energy supply security policies aimed at non-EU countries. In Chapters 3 and 4 it has become clear that also other major consuming countries will see their import dependence grow. Major consuming countries such as the US and China have promoted energy supply security as a priority in their foreign and security policy. Some EU member states have already followed suit. In the 2000 Green Paper the European Commission regrets that in external energy matters “unfortunately, the EU lacks the means to negotiate and exert pressure. The Union suffers from having no competence and no community cohesion in energy matters”.⁶ The European Commission has never been granted competence in external energy matters, nor can it dispose of a common foreign and security policy, which further limits the scope of the EU's external energy policy.

The twenty-five member states of the EU have a Herculean task to somehow merge twenty-five sets of policy objectives - energy policy as well as foreign policy, economic policy, etc.⁷ The accession of the ten new member states has made the harmonisation of policies even more difficult, given their diverse characteristics in terms of economic development, functioning of institutions, unemployment, political and economic orientation, etc. In recent years it was apparent that on a number of important issues no common ground could be found; for instance, the intervention in Iraq, the budget of the Union for the period 2007-2013 and, in part linked to that, the agricultural subsidies. Still, the member states pursue quite a number of shared goals and interests through representation by the EU in supranational or intergovernmental decision-making, most importantly the climate negotiations leading to the Kyoto-protocol and trade negotiations in the WTO. However, foreign and security policy are typically policy areas in which goals and strategic interests of member states highly differ and are therefore not often commonly pursued. EU member states pursue their own strategic interests and sometimes prefer certain bilateral relations over common multilateral ones. In some international organisations, certain member states hold specific decision-making powers that they do not want to concede to the EU, partly because they would lose influence – for instance trading in three UN Security Council votes for one – and partly because they want to play a role in international politics on their own account. Some of the ‘new’ member states, for example Poland, have a strong Transatlantic orientation and want to distance themselves from Russia, whereas other ‘old’ member states, most notably Germany under Chancellor Schröder but perhaps also The Netherlands, considering the general tone of the recent visit of President Putin, make efforts to improve the bilateral relations with Russia.

The basic aims of price efficiency, security of supply and environmental considerations are shared widely among consumer country governments. There is, however, less agreement on the specific policy choices

⁴ See <http://europa.eu.int>.

⁵ See Annex B for more information on internal developments in the EU energy market.

⁶ European Commission, *Towards a European strategy for the security of energy supply*, p. 28.

⁷ See Chapter 2, section 2.5.

that countries have to make to achieve this aim and on the most suitable policy instruments, which leads to distinctive dissimilarities between the EU member states' energy policies.⁸ An example is the pace at which the liberalisation directives are being implemented and the manner in which this is taking place. Where the Netherlands is implementing a full ownership unbundling of network and distribution companies, other countries are not taking that final step and only make a legal/organisational separation. Some member states, for example France, Germany and Denmark, seem to focus on creating national champions to compete on the EU market before fully implementing the directive, while other countries do not have such an industrial policy.

The way in which the directives are implemented reveals a difference in orientation between member states; trusting the functioning of the market to deliver benefits for the country as a whole, or having reservations and trying to serve and protect national interests from the position of the state. The European Commission is critical of the slow implementation of the gas and electricity directives. This was made clear by the DG Competition's recent inquiry into the energy sector.⁹ In some respects, the Commission represents a certain view of how the internal market should develop and is opposed in this view by certain member states that hold a different on how the internal market should develop.

Another important element that causes differences in energy policy orientations is the difference in the natural resource endowment of member states. Energy producing countries such as the Netherlands and the United Kingdom with oil and natural gas, but also Germany with coal, want to maintain their sovereignty over their own resources.

In Chapter 2 Putnam's notion of 'two-level games' was discussed. A nation state's domestic politics and its international relations are entangled and national political leaders play a game at two boards: both at the international table, with foreign counterparts, and around the domestic table with a variety of national stakeholders. These domestic-international interactions are omnipresent. What makes the EU's position in international politics difficult and what sets it apart from other actors, lies in the fact that the EU's external decision-making processes can be regarded as 'three-level games'.¹⁰ A third game-board consists of the relations of the member states with the Commission and making policy at that particular level. In the event that national political leaders succeed in arriving at a common EU position, representatives of the EU then have to defend this hard-won common position vis-à-vis other non-EU actors.

Considering the obvious historical differences between the member states, the differences in preferences of member states, and recent developments within the Union, in particular the rejection of the EU Constitution by some member states, the transfer of competences from the member states to Brussels in the areas of foreign, security and energy policy, seems very unlikely in the short term. The EU is not a unitary actor comparable to other major powers, and its policy space is therefore circumscribed differently.¹¹ The EU has no real government, but more importantly is not a political union. As a non-unitary actor its current policy space to set rules in geopolitical matters is limited. However, its capacities should not be underestimated, either. As an economic block and as an energy consuming region the EU cannot be neglected.

The following sections will further discuss the EU's potential in each of the three futures. In doing so it supplements the futures of Chapter 4 and continues in the same style, offering three plausible storylines specifically for the EU. These include an analysis of the EU's position in the international system, the

⁸ CIEP, *Study on Energy Supply Security and Geopolitics*, p. 63.

⁹ European Commission, Directorate-General Competition, *Energy Sector Inquiry*, November 2005.

¹⁰ Putnam, R.D., "Diplomacy and Domestic Politics", pp. 431-460.

¹¹ This is not to deny the complexity of decision-making processes of nations that can be regarded as unitary actors, for example the United States and the differences in environmental policy among the states. It demonstrates, however, that next to the complexities every state encounters, the EU as an actor faces another level of complexity in decision-making.

EU's relations with the rule setter, the EU's position in the international energy market and the EU's energy policy preferences.

5.2. The EU and the Expanded Functioning Core future

The future of the *Expanded Functioning Core* offers the EU the most possibilities to position itself as a global actor. The most important reason for these possibilities is that the *Expanded Functioning Core* does not require the EU to become a political project but can also be realised within the current context and economic powers. To increase its possibilities and to be fully capable of competing with other countries and regions, the Lisbon strategy to become the most competitive and innovative region in the world has to be fully implemented. If not, the EU's member countries will, under the global competitive circumstances, be unable to attract sufficient economic activity. With the international system becoming increasingly market-driven, the role of the EU as a union with limited economic clout might be marginalised. However, if the EU countries are able to continue on the liberalisation and innovation path, the EU can achieve a highly competitive economy, derive influence from this and demand a focus on issues that are of importance to the EU.

As the US is successful in actively expanding the market-based system, the EU has ample opportunity to complement US' policy with the promotion of adherence to international institutions and international regimes. The EU can take the lead in environmental discussions, including the successor of the Kyoto Protocol. It can voice concerns about human rights violations and take an active stance against poverty. However, the EU is still highly dependent on other actors to make progress on these issues. Although the EU has continued on the path chosen with the Kyoto-protocol and has ratified a successor together with Japan, a global treaty is still being negotiated. As part of the negotiations, the EU is promoting the development of a level playing field in industrialised countries by building a global Emission Trading Scheme (ETS). Within the EU this successful framework for trading carbon contracts is being expanded to all sectors of the economy, including air transport. As long as the level playing field has not been established, this causes concern regarding the EU's highly valued competitive position. The EU therefore insists that the emissions reduction targets of the new treaty be linked to the number of countries participating. The more countries, especially important emitters such as the US and China, ratify the treaty, the stricter the emissions reduction target. In this way the EU and other initial compliers can overcome possible economic disadvantages and at the same gradually expand the binding targets of the treaty.

In general, trade relations change, as economic activity seeks its most efficient location and labour force. Despite the EU's commitment to international markets, the relocation of certain economic activities has met with ferocious resistance in the member states. Even in the 2020s, protection measures to soften the blow for specific groups of the European labour market are in place. These measures are subject to fierce debates, both within the EU and in the WTO. For example, certain elements of the EU Common Agricultural Policy are still in place, although they are mostly being phased out. The budgetary room this offered has, for a large part, been used to finance the objectives of the Lisbon strategy and the UN Millennium Development Goals.

EU governments promote and subsidise promising innovative projects in the services and industry sectors. Strategic co-ordination leads to a successful division of tasks between member states, including in the energy sector. However, major differences in the social and economic positions of the member states still persist. Not all the member states have been equally successful in profiting from the market system, which is the result of either a less competitive position in the early 2000s, the existence of inefficient protection measures of the national economy in certain states, or the level of social opposition within certain member states against increased liberalism and globalisation. Liberalism and globalisation have led to greater income inequalities throughout the Union, although the per capita income in general has risen. As China expands the openness of its economy and becomes more integrated in the market-based system, EU-China trade relations change significantly. In the textile industry, for example, the EU has phased out its textile quota and has secured investment opportunities in China in return.

The *energy market* is organised according to economic principles, and security of supply is achieved mainly through market-based instruments. The EU, at the advice of the IEA, takes the initiative of introducing a tax system that stimulates energy efficiency on the one hand, and helps to finance alternative or cleaner energy resources on the other hand. Such measures are, however, controversial since producer countries see them as having a negative effect on their income. Certain member states worry about their competitive position. Therefore, the fact that energy and energy trade-related issues are increasingly negotiated in the International Energy Forum and within the IEA offers trust, as does the fact that large consumer countries such as China and India have an observer status of the IEA. The EU's co-operation with Russia in energy matters is largely depoliticised and develops into a rational and mutually beneficially economic trade agreement.

The liberalisation process in the EU continues in the original spirit. The EU energy market is no longer a string of national markets with bilateral interconnections, but a fully integrated European market. In the 2020s the EU energy sector is among the most competitive in the world and very energy efficient. Energy-efficient building and transportation technologies are among the best in the world. The objectives of environmental policy-making are integrated into energy policy. Strong efficiency in the energy market, combined with a smart taxation system and measures adopted in the post-Kyoto treaty, enable EU member states and important supplier countries such as Algeria and Russia to internalise the costs of CO₂ emissions reduction projects. The integrated EU system leads to a reduction of the risk of supply disruption and a reduction of the overall costs of the system.¹² Additional regulation reduces the risk for companies in concluding long-term projects and thus offers energy producing countries sufficient security of demand. Especially the relation with Russia as a producer country has benefited from this additional regulation that in principle makes a fully liberalised market possible without the risks and negative consequences for producer countries.

The share of nuclear power in the EU electricity production remains stable at around one third. A number of member states, among which France and Finland, have invested in the further expansion of nuclear energy capacity. Despite resistance in some countries, the EU has reached an agreement on the Commission's proposed framework on the issue of nuclear safety and management of nuclear waste.¹³ Although not every member state produces nuclear energy, its importance to the EU's integrated energy mix is generally accepted because it is a crucial element of the EU's security of supply and is also non-CO₂-emitting. The use of nuclear energy is monitored by EU and UN institutions and is fully compliant with the IAEA standards. Research on new reactor types and nuclear fusion, for example ITER, continues and offers promising results for future commercial use (see also Annex A). Considering the high costs, the EU co-operates with other OECD countries and to a lesser extent China and India in these research projects.

Modernisation in the energy sector takes place according to latest technological developments. To reduce *energy poverty* and increase access to commercial energy and thus meet the basic requirements for economic development and growth, modern technology sharing with developing countries is stimulated as part of development co-operation. In the highly competitive international environment, companies are reluctant to share expensive innovations too quickly, however. The EU proposes practical initiatives to develop sustainable energy technologies and to share these or export these to developing countries within the framework of the United Nations. Poverty reduction is achieved through increased economic growth. Just as amongst the EU member states, not all countries can profit equally from integration in the market-based system. In the countries that do, benefits are not equally distributed to all people. Tension, conflicts and deteriorating social-economic circumstances are still part of everyday life, even though in most countries the per capita income has risen. A large number of people, both economic and political refugees, are

¹² Helm, D., *European Energy Policy; Securing supplies and meeting the challenge of climate change*, 2005.

¹³ European Commission, Communication from the Commission to the Council and the European Parliament: *Report on progress in creating the internal gas and electricity market*, 2005.

on the drift seeking a better life in other countries. The EU member states still work on a common migration policy. The United Nations development goals for reducing poverty are not reached.

In issues of international *security* the EU operates within multilateral settings. It acts more as a unitary actor, also in the context of other multilateral organisations, such as the UN, WTO and the International Financial Institutions. The EU has little incentive to develop its military capacity further. It does develop a Common Foreign and Security Policy (CFSP) as well as a Common Security and Defence Policy (CSDP), but this is primarily seen as formulating a common stance and less as preparing for actual conflict. National development of military power takes place under NATO governance and should match CFSP and CSDP. The threats the member states perceive still differ and impact their choices made on military capacity. Special attention by most member states is given to rapid deployment forces to participate in UN peacekeeping missions or under NATO command. On security matters co-operation is focussed on terrorists and international criminal organisations. International security is subject to international co-operation and treaties. International security in energy-related matters such as infrastructure is dealt with through the UN Security Council and NATO. The EU, in this case led by maritime states, promotes international regimes such as the UN Convention on the Law of the Sea (see also Annex C) and the International Maritime Organisation. The EU shares knowledge about the protection, safety and security of critical infrastructure only with parties that have ratified these international regimes.

The EU's relations with the Middle East are intensified both through increased trade and political relations through the Euro-Mediterranean Partnership (EMP), and co-operation with the Gulf Co-operation Council (GCC). The impending membership of Turkey makes stabilising the Middle East more important. The EU closely follows internal political developments. Political reform movements in several Middle-Eastern producing countries cause concerns about stability, and consuming countries question the strength of institutions to absorb the sought reforms.

In conclusion, in the *Expanded Functioning Core* the EU has joint rule-setting power with more than one actor, in various policy areas, but is mostly a rule follower of the US. The success of the EU in this future is dependent on the ability of the member states to reform the economy; to implement the Lisbon strategy. Only then does the internal market offer economic power and continued growth make it an attractive preferred trading partner. Economic prosperity enables the EU to overcome internal differences of thought, although at times these still run high. Political differences between member states continue to exist but recognition of mutual interests and dependence cause them to be more easily overcome than before.

The EU's policy space is considerable in this future. Its deeper integration, also in the energy market, offers the EU a number of policy options. Both the EU's policy and that of its member states is characterised by:

- Fully implementing the Lisbon Agenda;
- Raising per capita income and reducing still existing large inequalities both within and between member states;
- Completing the internal energy market, especially completion of the physical interconnection of the electricity grid;
- Establishing a sound EU investment regime in which consumers, companies and governments profit fully of the internal energy market;
- Designing regulation that mitigates risks for companies and producer countries and makes long-term contracts and investments in major projects such as gas pipelines possible;
- Deepening the scope of ETS and setting up other market-based initiatives within the EU and promotion of the ETS outside of the EU;
- Co-operating and burden-sharing to enable member states to invest in clean energy options, stimulating energy transition;
- Supporting IEA/Energy Charter; promoting the stockholding system;

- Supporting the IEF to enhance relations between producer and consumer countries and increase awareness of each other's interests and possible win-win situations;
- Concluding agreements with consuming and producing regions on investment opportunities;
- Promoting international regimes to enhance international security and to protect vital infrastructure, including energy infrastructure;
- Promoting market integration and aiding countries in achieving full integration in the market-based regime;
- Being actively involved in promoting stability in the Middle East, which is seen not only as an important energy supplier region, but also as simply a neighbouring region;
- Military operations through NATO and the UN.

5.3. The EU and the Expanded Splendid Isolation future

The future of *Expanded Splendid Isolation* poses difficulties for the position of the EU. In a state-driven international system, an inter-governmental organisation such as the EU can only play a collective role if it succeeds in deeper political integration. If this is not the case, the EU member states will autonomously take up stronger national political roles and the EU as an organisation loses some of its relevance. This does not mean that Europe as a region will entirely lose relevance, nor does it mean that economic integration will end. But if the international system becomes increasingly politicised, the role of the EU as an organisation, if it lacks political power, will be marginalised.

In *Expanded Splendid Isolation*, serving the state's strategic interests is crucial. EU member states respond to a trend set in motion by China and the US to protect state interests through unilateralism in international politics and trade relations. The increase in the number of bilateral agreements forces other actors such as the EU member states to follow suit which thus pulls them towards the state-driven side of the system. The EU's institutions continue to raise support for economic co-operation to make up for its absent political power but this is done only piecemeal. Exports and trade relations remain fundamental points of member states' economic policy, but measures to protect national interests taken both by the member states and by the EU's main trading partners lead to efficiency losses and put restraints on economic prosperity and growth. Despite the overall sluggish economic performance, protection of and support of national interests gets the full support of most people in the EU. Those still trying to increase the political power and influence of Brussels face losses in elections and are not in power in most European countries.

The trend towards a state-driven system has further uncovered the EU's internal struggle. The historic problems with political integration should have been overcome if the EU as a whole were to play a significant role in this future. However, such a development would be contradictory to the overall trend of more attention for national interests and is therefore not very likely to materialise. As a matter of fact, the opposite is more likely. Member states are even less willing to give up sovereignty on strategic issues. Governments regard security in the broadest sense as more important than a free market and the cost efficiency that the EU claims to offer. The EU as a whole is not able to build a strong sphere of influence for Europe. Instead, several member states favour being parts of the US sphere of influence, while others believe in carving out a position on the world stage together with Russia. Some larger member states try to develop an independent position and their own integrated 'empire' with varying degrees of success.

The EU and its member states have to adjust to changes in the *energy market*. As China continues, and has success with, its equity approach to secure energy supplies and uses similar strategies for other strategic commodities, other countries have to adapt to the new circumstances and to this type of competition. In the energy market, this is especially difficult for (smaller) states with less negotiating clout that see their security of supply endangered. The role of IOCs is increasingly marginalised. NOCs, especially from Asia, do not have a profit motive and have no strict concerns about shareholder value. For NOCs and the governments of their countries of origin, profits are captured elsewhere in the value chain or economy. In energy, NOCs are a tool to gain access to energy resources and can afford to apply different strategies and

different measures of success.¹⁴ Despite being largely politically driven, NOCs do have attention for commercial interests and economic rationale. Access and availability have to be achieved against reasonable prices, also in comparison to other countries. To this end, especially technological developments are important.

Of the countries that are traditionally part of the market-based system it is the former hegemonic power, the United States, that alters its position relatively easily, making use of its economic size, its advantages in military capacities, and political and economic leadership. In response, the larger EU member states will return to national measures in order to secure their national supply. They want to be as independent and self-sufficient as possible, because it is clear that they cannot rely on EU solidarity. The emergency stock holds of the IEA still exist, but the decision structure has made the use of this system politically biased.¹⁵ The EU fails to agree on compensatory regional measures. The process of liberalisation of the internal EU energy market is sustained to a certain extent, but limited by measures that serve national interests that willingly or collaterally diminish the benefits of the single market for natural gas and electricity.

In electricity, the fear of depending on other countries or foreign companies that might elect to prefer the country of origin in times of crisis, which can lead to shortages, is predominant in all member states. The fear is a perceived one, since technical factors as well as contractual obligations make it unlikely that politically caused shortages will occur. The gas and electricity markets consist of a range of national markets with bilateral contracts and, in the case of electricity, limited connections to neighbouring countries. The industries are inefficiently organised which leads to high costs and an inefficient distribution of investment in the EU. Governments believe that these measures offer them at least some control to guarantee households an uninterrupted flow of energy. The lack of cooperation makes the EU member states vulnerable to supply disruptions. Smaller countries seek support from a major actor, such as the United States, Germany or Russia, to secure supplies. Others such as France try to build strong relations with countries in the Middle East and North Africa. France is most successful in Algeria.

In energy and in other commodity trade issues the EU member states get used to thinking in terms of ‘zero-sum games’ both amongst each other as well as vis-à-vis other industrialised states. The EU member states, especially the large ones, try to protect their national energy giants (and other national industry champions) and secure their inputs from ‘back yards’ outside the EU through long-term contracts.¹⁶ Governments play a decisive role in designing the energy market. These developments were already prominent in 2005 in, for example, Germany’s gas policy, in particular its agreement with Russia on a North European Gas Pipeline, bypassing Poland and the Baltic States. The then German chancellor Schröder, who during his seven-year term as chancellor developed a close relationship with President Vladimir Putin of Russia, dismissed the criticisms of President Adamkus of Lithuania by stating that “Germany has a sovereign right to take steps to make sure it has reliable and sustainable energy resources”.¹⁷ In the period to 2020 these words form a slogan that is heard in every capital of the EU.

International relations are tense and energy relations volatile. The ‘scramble for resources’ poses security dilemmas to the European countries. Competition between major powers for influence in producer countries causes tension in the international system. By supporting regimes with military aid, countries try to make sure that their nation is a favoured partner for oil and natural gas. European countries are mostly

¹⁴ Daly, M.C., *The paradox of international oil companies and Middle East oil*, Speech by President, BP Middle East & South Asia, 2005.

¹⁵ Willbenborg, R., Tönjes C. and Perlot, W., *Europe’s oil defences; an analysis of Europe’s oil supply vulnerability and its emergency oil stockholding systems*, The Hague, CIEP, 2004, p. 40.

¹⁶ CIEP, *Study on Energy Supply Security and Geopolitics*, p. 92.

¹⁷ “Lithuanian leader faults EU over new gas pipeline. Common strategy is lacking, he asserts”, in: *International Herald Tribune*, 27 October 2005.

dependent on other powers to secure influence, or they have to buy energy resources left over on the international market at high prices.

Nuclear energy is an important element in the strategy of states to become more energy self-sufficient. As the first generation of nuclear power stations are coming to the end of their life cycle, new ones are being built.¹⁸ Several states also invest in enrichment and reprocessing plants, which leads to safety concerns. The high costs of the new facilities are a heavy burden for states, and they try to sell some of their nuclear electricity to neighbouring states without nuclear installations through bilateral agreements.

In international *security* issues the several rule setters in this system demonstrate a readiness to use military operations to force states into compliance with the rule set. Military force can only be successfully used as long as it does not offset the balance of power with the other major actors. None of the great powers are willing to get into conflict with one another. Strong European states take care of their own national security and try to protect their extra-territorial and overseas assets; weaker and smaller countries try to use alliances. Global stability comes at a price in terms of human rights, social instability and an unequal income distribution. Social unrest and instability also affect the EU member states. Strict security measures and laws have limited migration, but affect the free movement of people within the Union. NATO loses importance, as member states prefer coalitions of the willing to collective action. The high seas and oceans are divided into spheres of influence and armed forces of coalitions of the willing secure sea lanes and other transit routes.

Persian Gulf energy producing countries expand their ‘Look East Politics’ and increasingly earmark their production for favoured trade. Especially China is an attractive partner for elites of producing countries as it makes a strict distinction between trade relations and any interference in the social and religious framework of these societies. The EU and, to a lesser extent, the US, have difficulty in remaining attractive partners for energy producing countries or countries with other strategic assets. The US has the advantage of military supremacy combined with the willingness to advance the interests of its national industry. Apart from the large member states, EU countries show more reluctance in applying the new beggar-thy-neighbour business ethic and try to expand and intensify co-operation with traditional partners.

The EU member states lower their development co-operation funds and support is mostly provided on a bilateral basis when serving a specific strategic goal. In general, the relevance of multilateral organisations under the UN umbrella and the International Financial Institutions is seriously weakened. They still exist, and the EU is represented both as an organisation as well as through individual memberships of member states. However, conflict resolution in most cross-border political, security and trade issues is sought through bilateral agreements rather than through multilateral institutions. It becomes increasingly difficult to offer developing countries incentives or assistance for reform. The UN has a hard time in raising support for the UN Millennium Development Goals. The goal of *energy poverty* reduction is a thing of the past and is not reached. Throughout the developing world semi-authoritarian and autocratic regimes are in power. The instable social situation of the 2000s is replaced by forceful stabilisation by ruling elites. Although seldom directly involved, China, the United States and European countries condone these developments in exchange for stability.

The EU keeps addressing *environmental issues*, but, as in other policy areas, lack of agreement among its member states makes it difficult to arrive at a common stance let alone promote this externally vis-à-vis other actors. Solutions to trans-national or international issues such as water management and global warming are generally seen as too costly and there is no majority amongst EU members to be a first mover and absorb the costs. The EU’s Emissions Trading System is upheld, but not expanded. On the one hand, self-sufficiency is an important driver for the development of alternative energy sources but, on the other

¹⁸ Helm, D., *European Energy Policy. Securing supplies and meeting the challenge of climate change.*

hand, the reluctance to share knowledge and co-operate in research and development seriously delays technological breakthroughs.

In conclusion, in the *Expanded Splendid Isolation* future the most plausible configuration in the EU is that the biggest member states will either try to dictate EU policy or stall developments that bind their national decision-making powers. Smaller states will seek the support of a bigger actor or perhaps try to work together. Due to internal disagreement, the EU as a unitary actor has very little to no political rule-setting capacities. Protectionism and the national interests of its member states delimit the EU's policy space in this future.

The EU's member states' policies are directed towards:

- Keeping up with the rest of the world in economic, political and military terms;
- Protecting economic achievements, both by individual member states and together in the direction of other countries, but only in so far that this serves national interests;
- Creating strong regional ties or seeking affiliation with strong actors outside the region;
- Following a policy of containment of internal conflicts;
- Continuing parts of the internal EU market - however, the energy market consists of national markets with some interconnection with neighbouring states;
- Trying to uphold the European Emission Trading Scheme, but withholding its expansion as long as countries outside the EU do not agree to participate;
- Continuing to seek an international agreement on global warming, but member states cannot agree themselves on the necessary steps, let alone have fruitful discussions with countries from other regions;
- Seemingly co-operating on clean energy options and creating incentives for energy transition, but deep down strictly protecting innovation policies and reluctantly or limitedly sharing any knowledge;
- Upholding the stockholding system within IEA, although several countries have doubts about the IEA decision structure;
- Concluding political strategic bilateral agreements and thus determining oil and gas flows (levels of success vary);
- Giving development aid increasingly as a strategic tool to buy political leverage;
- Responding to tense global international relations; dealing with instability and social unrest that also affect EU member states;
- Seeking active involvement in countries in the Middle East and North Africa, which sometimes means accepting and supporting semi-authoritarian and autocratic regimes;
- Conducting military operations in coalitions of the willing.

5.4. The EU and the No Core, No Gap future

The existence of two opposing systems, one market-based and one state-driven and each with its own rule-sets, in the future of *No Core, No Gap* offers the EU possibilities for, as well as limitations to, positioning itself in the international system. The EU must implement the Lisbon strategy to enhance its economic clout within the market-based system. It also has to work on political integration and enhance military capabilities to increase its position in support of the United States. The EU's competences develops incrementally, growing in some areas, shrinking in others. The EU succeeds in making the economy more competitive and increasing political unity. This is possible in opposition to the perceived common enemy of the state-driven system and as follower of the United States.

The EU has very limited rule-setting capabilities in this future. It might, however, be the future offering the most possibilities for the EU internally. There will be no direct competition with up and coming countries such as China and India, as these are part of the state-driven system. The existence of an opposing system forces the EU countries to set aside national interests. Furthermore, the US sees the EU as its most

important economic and strategic partner. For the EU, much the same as for the US, it is relatively easy to return to the role played for decades during the Cold War.

Economic integration continues within the Union and also between the EU and other regions and countries complying with the rules of the market-based system. Within the market-based system trade relations are highly efficient. The limited trade relations with the state-driven system impede global economic growth, and total prosperity is lower than in the case of the *Expanded Functioning Core*. Adaptations to the market system have been less problematic and painful, however, since many economic activities have remained within the Union. Consequently, the income inequalities and social problems, although still existing, do not pose an immediate problem.

The rise of two power blocks has bought the EU time on far-reaching decisions about deeper economic and political integration. It has chosen to adhere to the rule set of the US, despite internal differences between member states. Not every member state wholly accepts the US as rule setter, but it beats the alternative; the China-led rule set. The choice for following the US is largely driven by the Eastern European member states and the United Kingdom. Smaller countries with open economies opt for the US as well. Germany and France are most reluctant, but realise that there are no real alternatives. The US needs the EU as a strong ally and supports integration. The EU and the US maintain good relations with Russia, which is part of the state-led system but refuses to become an ally of China. The Lisbon strategy is implemented, but at a slower pace than previously expected. Measures to safeguard the population from effects of globalisation are decreased, but at a relatively slow pace since the harmful consequences of these measures to the competitive position of the EU are less interesting in a limited market-based system in which the EU is the most important actor after the US.

In economic matters the EU protects and expands its past achievements, among which the internal market, including a liberalised energy market. The European Commission takes a lead in protecting the single market and is supported by the member states. The characteristics of the international system in *No Core, No Gap* prompts the EU to closer co-operation with other OECD countries, especially the US. This leads to the conclusion that collective action leads to better collective as well as individual results. As the international energy market is a combination of free trade and a range of bilateral contracts, this goes for energy issues as well.

In the *No Core, No Gap* future, actors, including energy-producing countries, have to make choices between spheres of influence and between rule sets. As the energy market is in part free and in part divided by contractual agreements, this makes security of supply a difficult issue. Energy carriers are traded globally in a hybrid market with market incentives and direct political relations. Producing countries such as Canada, Mexico, Norway, Algeria and Kuwait are part of the market-based system, while others produce for the state-led system, for example Venezuela and Iran. Saudi Arabia produces for both, which allows it to stay clear of more intense interference by the two superpowers. Several producing countries support the idea of state control over the economy, but produce mostly for the market economies. Price differences occurring when neighbouring producing countries trade with different systems can lead to friction. Russia also produces for both systems and is balancing its energy diplomacy. The EU mostly co-operates on energy issues within the IEA. IEA member states co-operate closely amongst each other and with other countries in the market-based system. Although the OECD countries prefer 'free' molecules they are, for part of their energy supply, forced to deal with strict state oriented producer countries as well. The EU tries to limit these contracts with neighbouring countries in North Africa and the Caspian Sea region.

Internally within the EU, the European Commission gains support to complete the process of modernisation of the energy sector. The process of liberalisation is continued, but at a slower pace, creating a principally integrated European energy market. The interconnections of national energy markets allow efficient cross-border trade to offer better security of supply and lower burdens in securing spare capacity.¹⁹ Relations with Russia, which is part of the state-driven system, continue to concern some of the

member states. Russia supplies both the EU and China with energy and has enough political, military and economic power to withstand the pressure to make a definite choice for one system or the other. The dependency on Russia is a point of conflict among the member states of the Union. To a certain extent the countries do not have much choice; Russia is a large producer of both oil and natural gas and the necessary infrastructure is in place. New investments are needed in Russia to keep production at the appropriate level.²⁰ Large EU member countries want to assist Russia in order to secure sufficient supplies and strategically hope to bring Russia closer to the market based system. Eastern European countries want to limit their dependency. Poland is planning a number of LNG plants for this purpose. Such plans are considered counter-productive in relations with Russia. Since that relationship is also of importance to the US, it is American pressure that keeps Poland from building the LNG plans.

The EU tries to become as energy self-sufficient as possible and to import only from reliable sources. Nuclear energy has an important role in achieving this option. The European Commission promotes the use of nuclear energy whilst emphasising the need for the monitoring and control of trade in nuclear material. It therefore accepts US pressure to go for a once-through cycle.²¹ Uranium can be imported from Canada and Australia. Non-proliferation is an important issue, but neither the US nor the EU are able to prevent the spread of nuclear weapons technology within the other system. The industrialised countries also invest in innovation and alternative energy resources. Overall though, the higher costs of both nuclear energy and renewables does not change the preference for conventional resources.

In *international security* issues the US is prepared to militarily protect strategic assets and expects its rule followers to do the same. The US demands material and personnel support and urges the EU to further develop its Common Foreign and Security Policy and its Common Defence and Security Policy and subject them to the US doctrine. Traditional differences of opinion between member states persist but they understand the need to comply. Fence-sitting is a luxury that can no longer be entertained.

Although there is tension between the two rule sets, open conflict is not likely to occur, despite potential flare points such as Taiwan or the Chinese presence in Venezuela and Cuba. Conflicts are more likely to occur in the battle of influence over geopolitical pivots.²² This includes Venezuelan attempts to control Curacao, which is part of the Netherlands Antilles and has become an important strategic base for the US and allied forces in the Caribbean. It also includes a series of energy producing countries that have not made a clear choice for either of the systems or where social instability might provide the opportunity to bring another regime to power. In case a government shifts allegiance, either the US or China will try to intervene and allies such as the EU are expected to support the intervention. Ethical considerations about the moral implications of certain actions are of minor importance, although some smaller European countries occasionally object to human rights violations in strategic partner countries. Reputation is important, however, and with the free flow of information in the market-based system, especially these actors have to be careful not to get entangled in actions that might hurt their international images and therefore limiting their room to manoeuvre.

The role of multilateral institutions is limited, although they still serve as a 'neutral' platform for the two systems to meet. Regional organisations such as ASEAN and GCC and interest organisations such as OPEC have lost their meaning since they include countries from both rule sets.

The *No Core, No Gap* future offers some room for secondary energy policy objectives, most importantly reducing *energy poverty* as part of the UN Millennium Development Goals. However, this is mostly done on strategic grounds and only with countries that adhere to a particular rule set. There is a price tag atta-

¹⁹ Helm, D., *European Energy Policy. Securing supplies and meeting the challenge of climate change*, p. 3.

²⁰ Janssen, E., *Can Russian oil growth be sustained?*, CIEP Briefing Paper nr 4, The Hague, CIEP, 2005.

²¹ See Annex A.

²² Brzezinski, Z.K., *The Grand Chessboard: American Primacy and Its Geostrategic Imperatives*, pp. 40-48.

ched for the recipient countries. Since reputation is important in the chances of increasing the sphere of influence, the most important actors in both rule sets try to help developing countries. The Millennium Goals are not reached. Inequalities remain throughout the world. Semi-authoritarian regimes are in power in most of the developing countries. Social unrest and political instability is kept in check as much as possible, however they are stimulated as well if it serves the strategic interests of one of the rule setters.

The EU is aware of the importance of environmental protection. The European Commission emphasises the importance of including *environmental considerations* in its energy policy and continues pursuing (post-)Kyoto targets. The EU strives for a policy on global climate change within the market-based system. However, the US is not willing to accept measures that lead to higher energy costs or measures that disrupt the functioning of the market system. As a consequence, the EU is reluctant to implement measures that imply disadvantages for European companies and inequalities in the level playing field. The US also urges that the only sensible climate change policy includes countries in the state-driven system, especially China. The EU has contacts with China, but the political polemic situation does not allow for any progress on global warming. Insofar as the EU's policy space allows, the EU uses capital to pursue environmental objectives. Energy efficiency and energy savings are continuously promoted and funds are made available for research on technological innovation. The Emissions Trading Scheme is important and the Clean Development Mechanisms and Joint Implementation make it possible to combine reduction of energy poverty with environmental objectives.

In conclusion, in the *No Core, No Gap* future the most plausible position of the EU is that of the largest and most important economic and strategic ally of the US in the market-based system. The EU will thus play second fiddle to the US. The EU has very little rule setting capabilities, but only a few of the member states consider this to be a problem. The EU will continue with the Lisbon Agenda and try to pursue more political and military unity. The latter works relatively well since the differences between the member states are considered to be of lesser importance than opposing the state-led system.

The EU's policy and that of its members is directed towards:

- Implementing the Lisbon Agenda;
- Increasing political and military co-operation in line with the US rule set, conducting military operations through the NATO;
- Responding to tense global international relations, keeping in check instability and social unrest or using these to the advantage of the rule setters. Ethical issues are of secondary importance;
- Protecting economic achievements of the market-based system;
- Completing the internal energy market, especially completing the physical interconnection of the electricity grid;
- Supporting the IEA/Energy Charter; promoting the stockholding system;
- Promoting self-sufficiency where possible; importing oil and natural gas from reliable partners, mostly through the market, some based on bilateral agreements (Russia);
- Designing regulation that mitigates risks for companies and producer countries and making long-term contract and investments in major projects such as gas pipelines possible;
- Continuing to seek an international agreement on global warming, despite the unwillingness of the US to participate without China and great political differences that hinder agreement with China;
- Upholding the European Emissions Trading Scheme, but withholding expansion as long as the US is not willing to participate;
- Co-operating and burden-sharing among the industrialised countries to invest in clean energy options;
- Giving development aid increasingly as a strategic tool to promote market integration and to aid developing countries that are strategically interesting;
- Being actively involved in promoting stability in the producing countries that produce for the market-based system;

- Being actively involved in international security and protection of vital infrastructure, including energy infrastructure.

5.5. The EU as rule-setter?

The position and policy space of the EU in each of the three futures differs. What all futures have in common is that the EU's maximum rule-setting capacities lie in a joint venture with the strongest rule setter. In the three futures the EU will, acting as the supranational organisation it is, at least in part be dependent on other actors such as the US and other OECD countries.

Whether the EU can have autonomous rule-setting power is up for discussion and is the subject of this section. Can the EU ever be an autonomous rule setter or is the EU destined to follow the rules set by other actors? Can the EU at most become 'the best of the rest' or can it be an active joint rule setter together with one other major actor in a successful form of multilaterally based bilateralism?²³

What is needed to make the EU rule setter is leverage; economic, political or military leverage. In an *Expanded Functioning Core or No Core, No Gap* future, the EU can use its economic leverage, in the *Expanded Splendid Isolation* future protectionism impedes economic co-operation and integration and thus decimates this type of leverage. Political leverage of a supranational EU is primarily attainable in the *Expanded Functioning Core or No Core, No Gap* future in which the international system and the relations between the most important actors offer relatively safe circumstances for the EU to continue its slow political integration. In the *Expanded Splendid Isolation* future, the lack of trust and the emphasis on the interests of the nation-state are too great a hindrance to political integration. Military leverage of a supranational EU does not occur in any future. The EU's military build-up is expected either to take place under NATO governance or in coalitions of the willing, but a supra-nationally led EU standing force does not egress from either future.

The three futures offer little evidence that in response to developments within the international system, the EU will be able to generate sufficient political or military leverage. In two of the three futures economic leverage might have spin-off effects and offer sufficient leverage to grant the EU some political clout, but this is clearly different from political leverage and depends on the success of the member states becoming more competitive and innovative than its economic competitors. It is worthwhile to turn the argument around and ask: In what way – regardless of the future – can the EU establish sufficient leverage to become a rule setter in the international system and in the international energy market?

To become a rule setter it is important to take existing capacities into account and build on these. The EU's strong points on which to build its rule-setting powers lie in the scope of its economy and trade balance, its skills and experience in soft-diplomacy and its promotion of technological innovation. Yet, there are also weak points that hold back development as a rule setter. The latest enlargement round and the planned new accessions demand a lot of effort to remain a Union. These internal processes may frustrate external projects. The EU, then, can in neither future be a rule setter comparable to the US or China. It can be a super-power, but never a super-state as other actors with a central government that determines both internal as external policy.²⁴

In 2005, the EU member states account for roughly twenty percent of the global GDP, comparable to the twenty percent of the US. Economic growth in the past years has lagged, especially compared to China's

²³ The term 'multilaterally-based bilateralism' refers to the situation in which a number of actors are collectively organised and as a collective maintain a political or economic relation with one other actor. See also Van der Linde, C. and F. Hoo-geveen, "Verenigde Staten en Europese Unie: Trouwe bondgenoten? Nieuwe episode in energiediplomatie", in: *Internationale Spectator*, Vol. 59, nr. 7/8, 2005.

²⁴ Rob de Wijk illustrates this by making the distinction between the Dutch terms *supermacht* and *supermogendheid*. De Wijk, R., *Supermacht Europa*, Leidschendam, Mets en Schilt, 2005, p. 11.

nine percent and India's eight percent, but it still accounts to two percent. EU foreign direct investment in the US amounts to USD 855 billion, or 62 percent of the total FDI in the US in 2003. Trade between EU and China was roughly 175 billion USD in 2004 compared to 161 billion USD with the US.

Chairman of the European Commission Jose Manuel Barroso expresses a clear preference for building upon the EU's economic power. At the EU informal summit under the Presidency of the UK in Hampton Court late October 2005, Barroso shared his vision with EU politicians. Barroso sees globalisation as a trend that will not stop; the only way to respond to the trend is to adapt to this world by forming a strong EU through further internal integration and co-operation and especially by continuing the Lisbon strategy.²⁵ This strategy envisions that the EU becomes the most innovative and competitive economic block. In recent decades the EU has lost much of its innovative capital, including human capital, to other regions, especially the US. To turn this trend, the member states must redefine its internal as well its external policy. It also means overcoming political differences and the current focus on national interests. It is also necessary to find ways to have more political clout, simply by being able to deal with state-oriented countries and actually have, as a EU representative, that economic leverage fully behind you, rather than representing the economic size of twenty-five countries but having asymmetrical interests.

Apart from economic leverage the EU can build on its diplomatic skills. Although the EU's diplomacy is most often backed by economic carrots and sticks and not with military deterrence, a non-confrontational approach to some other actors can raise goodwill and thus also offer advantages, especially in comparison with the current unpopularity of the current hegemonic power, the US. In climate change issues the EU can continue to set standards for market-based solutions to CO₂-emission reductions, although it has to be careful not to become too tied up in one solution for global warming and demanding of other countries in adhering to the EU approach. The strength of the EU lies in making the most of its soft power. It can set rules by example, not by making demands. Co-operation with developing countries on clean energy solutions through CDM and JI measures is an example of using soft power and trying to fulfil policy objectives.

A possible strong point could become the development of a strategic partnership with Russia. The EU offers a stable market for Russia's oil and gas, and a solid relationship with the EU offers Russia the space to allocate more time and effort to maintain the integrity of its Southern and Asian borders. Despite misgivings in some member states, the advantages of a sound political and economic relationship with Russia is inevitable. An understanding on accepting each other political-economic choices helps to overcome some incompatibilities. Investments in each other's economies are stimulated to create further interdependencies.

5.6. Conclusion

The three energy futures presented above and in Chapter 4 each demand their own strategic policy approach. At the same time preparing for these futures demands a general approach to EU decision-making that is flexible and robust and offers room to manoeuvre in all three futures.

The developments in the present international system demonstrating both increased integration into the international economy by developing countries and increased focus on the nation-state and on national interests cause uncertainties on the paths that are open to the EU.

In all three futures the EU should strategically reorient the economic and political agenda in order to position itself in the international markets and the international political system. The current strategies, especially political, but also the plans regarding the Lisbon strategy, fail to meet the rapid geo-economic and

²⁵ Barroso, J.M., Statement made at the press conference following the EU informal meeting of Heads of State or Government, Hampton Court, 27 October 2005. European Commission, *European Values in the globalised world*, Contribution of the Commission to the October Meeting of Heads of State or Governments, COM 525 final, 2005.

geopolitical changes. Ironically, without a state-driven strategic reorientation on the structure of the EU internal market and its interconnectedness with the global economy, the international competitiveness of the EU's industry will weaken, and lessen the possibilities to ensure the flow of energy sources, in particular oil and gas, to Europe.

As a unitary actor the EU can only answer to the three futures by further developing the necessary political-strategic competences that gives it leverage and by being set on track in the suitable direction *by its member states*. These processes are time-consuming. The current EU competences have little strategic value. The likelihood that EU institutions will be able to restructure the market to fit the new international circumstances is small for two reasons: one, the institutions lack the mandate to take the initiative and two, some of the EU institutions are strong believers of the market-based system as the global future. At the same time, current geopolitical changes and the incapacity to act on a European level will put the political integration processes and perhaps the economic achievements under pressure because of the already visible revival of national interest. Germany's policy in the gas market, in particular its close ties with Russia, can be seen as an example of this, whereas at the EU level a suitable stance vis-à-vis Russia appears hard to formulate. Other member states also prefer the bilateral ties with Russia to become deeper, while the EU-Russia relationship remains in limbo.

In the meantime policy-makers and politicians in many EU capitals assess the consequences of the geopolitical changes and the ensuing consequences for the national energy and foreign policy. The national interests are not similar to European interests, as the energy mix of member states is still diverse and the risks in supply security asymmetric. In addition, the EU's energy and foreign policies do, by agency of the same member states, lack the balanced competences necessary to make a difference. The most developed competences lie in the field of the internal market and competition, while competences in the field of security of supply and foreign policy are weak. This has consequences for the EU's actions vis-à-vis other actors. In the three futures, especially in *Expanded Splendid Isolation and No Core, No Gap*, but also in the market-based *Expanded Functioning Core*, the EU's competition policy *alone* does not suffice as an instrument for a balanced energy policy.

Unless the 25+ EU member states can meet in a new strategic approach to the EU's external energy policy, the promotion of strategic energy relations will remain the nation state's prerogative, and the few delegated competences may even return to the EU capitals. Formulating a common energy policy in which more attention is paid to the EU's external relations may furthermore disclose a confrontation between various divisions of the European Commission, as not all Directorates-General work with the same agenda.

One way for member states to prepare for a future in which the functioning of the market to secure energy supply is not guaranteed, may be to stimulate the presence of international oil companies that can operate in partnerships with state companies. To make this *public-private partnership* work, these EU-based companies should have enough clout to serve as a credible partner for the NOCs of producing countries. Should the market-based system be dominant, these companies can continue their competitive course in securing access to denationalised molecules.

In case the EU makes the wrong strategic considerations, the costs of the availability of sufficient and affordable energy resources can be very high. Given the developments in today's international system in which the US's interests in the EU decrease and the US's interests in Asia increase, it is possible that the EU cannot automatically count on the US' support anymore to secure national interests. The EU has always been a rule follower. It is unclear now what the rules of the future will be and who will set them.

The natural reaction of the states of the EU is to refocus on national interests when faced with new economic players that work with new and, for the EU, 'alien' mores. If the EU wants to fulfil a meaningful task in the international system, politicians and policymakers of the EU member states and in the European institutions must stand for the task to ignore this reflex. The EU needs to create more political room for

manoeuvring for Brussels, stand for the market-based system by fully implementing the Lisbon Agenda while designing policies to become partners with areas and countries that do not adhere to the same rule set, strengthen relations with Russia and remain an ally to the US. Such a balancing act might be difficult, but will be the only way to create a robust position for the EU and to be prepared for the future, whatever the mores.

6

Conclusion

Past and current geopolitical changes have shown to lead to political and economic structures in the international system that offer a breeding ground for future conflict among major powers. Today's politics and policies - and especially the perceptions and interpretations thereof - will determine the future balance of power. In the last decade the world has witnessed incidental changes that give reason to believe that several trends are becoming visible that can be seen as starting points leading to different futures.

Projecting the main outcomes of the analysis of the current international system and geopolitical changes has led to three possible geopolitical landscapes towards 2020 in which the impact on the organisation of energy flows differs widely. The first is an *Expanded Functioning Core* future characterised by a trend towards a market-based system in which all economies are becoming integrated and in which the US is the most important rule setter, supported by the EU and Japan. Second is an *Expanded Splendid Isolation* future characterised by a politically/state-driven system in which China is the most important rule setter and in which national interests determine economic and political activity. Finally, a *No Core, No Gap* future characterised by a new type of bipolar system, in which some of the formerly planned economies and other countries partially integrated into the international system create their own politically/state-driven economic and political system alongside the market-based system. In this bipolar system, two rule setters, the US and China, are each dominant within their spheres of influence.

The geopolitical balance of power will be of great importance for the volume and direction of energy flows. At the same time, energy demand and supply and energy trade relations will fuel geopolitical changes. Each of the geopolitical landscapes constitutes a different energy future. In the *Expanded Functioning Core* the energy sector is organised according to market principles, while in its mirror image, the *Expanded Splendid Isolation* future the energy sector is organised through a range of bilateral contracts and contacts between consumer and producer countries driven by national strategic interests. The energy sector in the *No Core, No Gap* future is a hybrid of free trade mechanisms combined with politically determined contracts, resembling today's energy sector, but with more pronounced delineations.

The position and role of the European Union in the future international system is far from clear. Much will depend on the capacity of the twenty-five or more member states to agree on common marching orders. The challenges the EU will face as a unitary actor differ per future. In the *Expanded Functioning Core* future, the EU can only play a role if the member states succeed in executing the Lisbon strategy and indeed become the most competitive and innovative group of countries in the world. In the *Expanded Splendid Isolation* future, the EU can only play a collective role if it succeeds in political integration. If this is not achieved, the EU member states will autonomously take up a stronger political role, and the EU as an organisation will lose relevance. The *No Core, No Gap* future may offer the EU the most possibilities to rearrange its internal organisation and prepare for collective external politics.

The next sections present the conclusions on changes in the energy market and on energy and sustainable development (6.1), on related geopolitical changes (6.2), and on the three possible energy futures (6.3).

6.1. Market changes: A new energy sector?

Global energy demand is projected to continue to grow in the coming decades. In the short- to medium-term oil will remain the most important fuel in the energy mix, followed by natural gas and coal. Main

consuming countries are expected to continue to import more energy. Despite efforts to alter the composition of the energy mix by incorporating renewable energy sources and possibly nuclear energy, a large share of it will remain fossil fuel-based. Energy use can be made more efficient and thus limit demand and, to some extent, the level of import dependence.

Oil and natural gas reserves are increasingly concentrated in but a few countries and the international political and economic conditions in which these resources will be traded are unclear. The IEA, for example, estimates that 65 percent of the known oil reserves belongs to national oil companies. The remaining 35 percent is more or less open for foreign direct investments. Although the production of oil by national oil companies can very well be traded on the international oil market, the potential of these companies to secure sufficient investment resources for the timely and efficient development of oil and gas reserves, and sometimes their willingness to keep delivering to the international market, is questioned. A new structure of the international energy market in which the share of 'nationalised' molecules is increasing relative to 'denationalised' molecules may call for new approaches by traditional consumer countries. Especially in a tight market in which there is little spare capacity, consumer countries will have to re-evaluate the effectiveness of their security of supply strategies.

The demand for energy remains high in all consumer regions. However, the demand for oil and, to a substantially lesser extent, for natural gas, is gradually shifting away from the traditionally large consumer blocks of the US and Europe toward the growing Asian Pacific market. Geographical changes in the demand side of the energy market is also of influence in the structure of the international energy market, especially if they lead to a new business rationale of bilateral trade agreements. Similarly to numerous producer countries, the upcoming consumer countries prefer national control of their energy balance. Chinese and Indian companies can do business from a different rule set than that of international oil companies with listings on stock markets in the US and Europe. The Asian rule set stems from national interests and is easier to match with the nationally-oriented rule sets of state companies in producing countries.

In addition to the 'factual' balance between demand and supply, there are other developments related to energy security that pose a challenge, e.g. the continued social and political tension in producing countries. The possible effects of international efforts aimed at stability in these countries are limited. As the market changes, some consumer countries' call for producing countries to advance institutional reform may increasingly fall on deaf ears. The demand coming from new customers that are less critical of domestic social circumstances make the need for reform less urgent. The potential of increased competition for influence and resources globally and especially in the Persian Gulf will make the energy sector a highly volatile business in the coming years.

In the discussion about the future direction and volume of energy flows, the existence of transport choke points presents an additional risk. Accidents, whatever the cause, could have a disruptive effect on the supply of seaborne oil and LNG. Moreover, there are also uncertainties about the quantity of global oil reserves.

Changing the composition of the energy mix to include more renewable energy sources or clean use of fossil fuels is costly, as are the great investments needed to develop additional production capacity for oil and natural gas all along the supply chain. In combination with efforts to limit the amount of GHG emissions in the Earth's atmosphere and the commitment of the international community to decrease energy poverty, the financial and political efforts necessary in the coming years are huge.

The processes of liberalisation and integration of the energy market, especially in the EU, that started from an objective of cost efficiency, may need a reassessment. Despite modest positive initial results, the changing external political developments described above make it difficult to assess whether liberalisation will bring about the desired cost efficiency and benefits for consumers, or whether the benefits will be predominantly felt in producer countries and competing consumer countries. More uncertain are the implica-

tions for energy supply security. In the EU, the integration of national energy markets limits the capacity of member states to influence their domestic markets, and at the same time member states demonstrate reluctance to give up their sovereignty in this policy area. This combination might pose a mounting policy dilemma in the future. Changing international circumstances ask at least a review of the competition and regulation agenda in order to uphold a strategic position in world markets.

Wider co-operation between consuming and producing countries and among major consumer countries may limit the negative effects that are currently almost intrinsically linked to energy use and energy trade – be it dependence on supply or dependence on demand, be it high prices or harmful environmental effects. Whether such co-operation will come about is highly dependent upon the capacity of states to escape the trap of a prisoner's dilemma. In a market-driven system it is difficult for governments to foster the right economic incentives to advance these costly changes, in a state-driven system governments might not even be prepared to make such an effort unless it indisputably serves national interests. As long as countries cannot reach agreement multilaterally and no country will unilaterally make a first step, incurring the costs of either a higher price for its energy consumption or a smaller production margin, the dilemma between short-term gains and long-term losses will persist. Short-term interests will prevail.

Important elements of energy policy are subject to geopolitical developments. Despite, for example, the recognised importance of global problems such as global warming and energy poverty, finding answers and solutions to these problems is dependent on wider global international trends. Only energy security is as much a driver of geopolitical developments as it is driven by them. The challenge for consumer countries lies in finding the right balance in their energy mix - in terms of composition of energy sources, supplier countries and secure supply lines - in such a way that all three pillars of energy policy are evenly met and the competition for energy sources does not lead to new conflicts and tensions.

6.2. Geopolitical changes: A new globe?

The geopolitical landscape has undergone major changes in the past 15 years. The end of the Cold War and the emergence of new political and economic powers have reshaped the context of international political and economic relations in the world. These changes have created a new context for global energy markets and energy relations.

In Europe and in certain circles in the United States there was a strong belief that the victory of the capitalist democratic system would create a large peace dividend. For this dividend to materialise, full political, legal and social integration was required of Eastern European countries, Russia, China and developing countries into the international market system with its political and social institutions. The new world order expected to occur after this transition would transform political and strategic rivalry into economic rivalry. Reality was different, however.

The expected strong globalisation to some extent made way for weak globalisation in a relatively short time span. This is a general trend, but is particularly visible in energy markets. The grounds for this interpretation of national interest based or weak globalisation is that the countries adhering to this type of globalisation have little trust in the hegemonic power, the US. This became more apparent after 2001 when the US, for national security reasons, began to more closely define the political, legal and social requirements for integration, i.e. the rule set or mores of the international system. Before this date, the US had been less clear about the mores and relied on the logic of the market as the main tool to achieve full integration. The new interpretation of the rule set by the US after 2001, and particularly after the intervention in Iraq in 2003, has motivated some emerging consumer countries, such as China and India, and producer countries towards a more state-oriented approach to globalisation in which national interests are the main purpose for their international activities – especially now that the US is seemingly attempting to serve its own national security interests, which has narrowed the room for alternative interpretations of globalisation. The legitimacy of the hegemony of the US and its message of markets, democracy and freedom, is eroding.

The awareness that traditional proponents of the market-based system have difficulty themselves in adhering to the economic principles that they propagate, adds to the suspicions towards the market-based system. The difficult WTO negotiations serve as a good example of this. On the other hand, when thought opportune, states with a formerly planned economy do adopt economic standards and integrate parts of their market into the international economy. The problems are worsened by difficult and strained relations between important actors, adding to misunderstandings and misinterpretation of actions, e.g. US-China, China-Japan, EU-Russia and US-EU-member states and ongoing security concerns about, for example, North Korea, Taiwan and Iran.

Currently, the world is still characterised by two orientations to the international system, one focussed more on economic efficiency as the leading principle of governance and the other focussed more on the effectiveness of national interests promotion. Today's changing international relations will lead to an unknown and unpredictable geopolitical landscape. Because energy itself is subject to geopolitical manoeuvring, the impact these changing relations have on the international energy market is obvious.

6.3. Different futures: A new international system?

The analysis of past and current geopolitical changes has led us to three distinctly different energy futures towards 2020. The past has shown that over time a certain hierarchy in the international system can develop in which one state or a group of states becomes powerful enough, or at least influential enough, to determine the mores of the majority of global interactions, for example the US and the USSR during the Cold War and the US and European countries during the 1990s. In the three futures this role is fulfilled by the US, China, and the US together with China, respectively. In the background potential influential players such as Russia, India, Japan, the EU and some energy producing countries can have a decisive impact.

The *Expanded Functioning Core* future is characterised by a market-based system in which most economies become more integrated, although some reluctantly and although some will experience political and social difficulties. Problems are most pronounced in developing countries, but are also visible in developed countries, for example in Europe. The US is the most important rule setter, supported by the EU and Japan. The rise and integration of China into the system goes rather smoothly and China is allowed more room on the international political stage. In this future the *energy sector* is increasingly organised according to market principles. Security of supply is largely arranged through world energy markets, although continued instability in key producer countries necessitates the use of security and military forces. This is preferably done with multilateral consent. Climate change and energy poverty are both recognised as important trans-national problems that can only be solved collectively. Still, the focus on competitiveness and the large role of the industry in this future makes global collective action difficult. In the *Expanded Functioning Core* future the European Union can only succeed in keeping up with the global economic competition by fully embracing the Lisbon strategy directed at economic growth and competitiveness. For energy security it is important that the EU arrives at an approach in which contacts with producer countries are better managed. Without realising the Lisbon agenda, the EU and its companies cannot compete optimally with the US and other actors, which might increase security of supply risks. Even if the Lisbon agenda is implemented, the potential of the EU for becoming a rule setter remains limited due to time consuming internal processes.

The *Expanded Splendid Isolation* future is characterised by a politically/state-driven international system. Societies, economies and political systems are largely governed by strategic choices made by political elites. Protecting national interests is the purpose of international economic and political activities. China is the perceived rule setter, but the United States will remain the most powerful actor in military and economic terms. The US easily shifts towards the more political rule set, triggering other actors such as Japan and the EU, or its member states, to do the same. Russia's rulers will see themselves confirmed in the direction chosen in the early 2000s. The result is an international system in which a number of actors are building their political clout and try to secure strategic positions, resources and trade relations through po-

liticised bilateral relations. This includes the energy sector. In this future, oil flows are governed by bilateral deals, and remaining volumes are sold at high prices on a seller's market. Consuming countries give active military support to ruling elites to limit the chance of a supply disruption caused by social unrest in producer countries. Climate change is recognised as a possible future threat to national interests and even national security. Due to a focus on short-term national interests, governments cannot arrive at a common approach. Energy poverty reduction is mostly provided when serving strategic interests. In the *Expanded Splendid Isolation* future the EU can only be considered an actor of importance if the member states are able to delegate political competences to Brussels, which thus far has been considered to be the nation states' prerogative. Such a development would be in contrast with the overall global trend towards national interests and seems unlikely. The EU will therefore not be a rule setter in this future.

No Core, No Gap is characterised by a bipolar system, in which a politically/state-driven system exists alongside a market-based system. The rhetoric of the US about liberalism, democracy and freedom has led to a reorientation by China of their own political and ideological roots. Other countries have to choose for one of the two rule setters. The EU and Japan are the most important supporters of the US. As Russia and India are unwilling to accept the US rule set, they reluctantly accept China's, although they cannot be considered its allies. In this future the market-based system organises energy supplies through free trade, while in the state-driven system energy supplies are secured through direct bilateral dealings between governments. The rule setters continuously try to draw producing countries into their sphere of influence. Military intervention is also an option. Measures against global warming are discussed in the market-based system, but countries differ on the direction of the solution. Co-operation between the two systems on climate change is impossible. Developing countries are aided by their respective system in reducing energy poverty. Successful development might be prove of the strength of the respective ideological underpinnings and can be used to enhance the reputation of the rule setter. In the *No Core, No Gap* future the EU has accepted the rule set of the US, although some member states do so reluctantly. The external threat of the opposing system makes unified political action possible, as well as the decelerated implementation of the Lisbon strategy. Relations with Russia are very important for security of supply, but also in overall strategic considerations to ensure that Russia does not become too close to China. The overall international system leaves very little room for the EU to become a rule setter.

The construction of the international system is a dynamic process and there is no end, no finality, to the structuring of international politics or the international economy. This report offers no conclusion in terms of the most likely outcome of that process. The main actors in the international system and the international energy market continuously interact, causing geopolitical relations to shape and reshape time and again and the balance of power to be redefined over and over. The three futures define possible balances and matching mores, coming from an analysis of current developments, perceptions and trends. The future make-up of the international system and energy flows lies in current actions. The roots of tomorrow's mores are in today's deeds.

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1

Demand, supply and transit of oil¹

Oil has played a major role in the substantial growth of international trade in the past few decades. Oil was the preferred fuel because it was abundant, easy to transport and had wide applications in new industrial process technologies and products. Subsequently, the light industrial and process technology sectors were able to increase the efficiency of production processes, ending the requirement for corporations to position themselves near fuel supply centres, transport corridors or coastal industrial sites, which is still more or less a requirement for the gas and coal industries. This new economic flexibility resulting from the use of oil as the predominant energy source, in combination with improved communication methods and international capital flows, enabled the internationalisation of production. The new flexibility enabled companies to reduce the costs of production by relocating their production facilities to those sites where labour, energy, capital or knowledge costs were the lowest.² Oil was at the heart of the post-1945 economic expansion in the world and still is the main energy source globally, especially essential in transportation. The availability of oil at a reasonable price is crucial for economic growth and development. Oil is a strategic commodity, since oil products are used to fuel aircrafts, tanks, military transports and navy vessels. Oil is also a politicised commodity. The two oil crises of the 1970s were caused by political and military tension rather than an actual shortage of oil. The current high oil prices are different in nature, since the basic problem is a tight market in which oil demand has caught up with oil supply, with little leeway in production capacity.

Economic factors	Geopolitical factors
Strong demand growth China, the US and India	Concentration of reserves in a few countries (especially Persian Gulf)
Underinvestment during the 1990s <ul style="list-style-type: none"> • Production capacity constraints • Refinery capacity constraints 	Increasing import dependency of and competition between consumer countries
Investment climate of producing countries <ul style="list-style-type: none"> • Access of foreign direct investment 	Stability of producer countries
Uncertainties about producible reserves	Security: infrastructure and transport vulnerability
Transport bottlenecks	Tension in the Middle East

Table 1.1 Factors determining the current oil market

Source: CIEP

¹ Numbers in the annex might differ with the numbers presented in Chapter 3. In Chapter 3 the IEA World Energy Outlook 2005 was used for oil and natural gas demand and supply. Extensive overviews of the other fuels are not available in the 2005 outlook and therefore we have decided to use the IEA World Energy Outlook 2004 for demand and supply figures.

² Dicken, P., *Global Shift: The Internationalization of Economic Activity*, second edition, London, Paul Chapman Publishing, 1992, pp. 91-227.

1.1. Oil reserves

Proven reserves are defined as oil deposits that are considered 90% probable to be produced at current prices with current technology.³ BP estimates put proven oil reserves at almost 1.2 trillion barrels (see table 1.2 below).

More than 60% of proven oil reserves are found in countries around the Persian Gulf. This region is the only region that can support its present oil production for more than 40 years. Concentrating on proven reserves, however, understates the availability of oil, because proven reserve figures are based upon year-end oil prices of the year previous to the year they are published, as well as upon technology available at the time of reporting. Consequently, the proven reserves provide only a short-term outlook on producibility of oil reserves. They will drop if prices are low and rise if oil prices are high. Technological improvements can also attribute to improved producibility of oil reserves.

Continent/ region	BP Year-end 2004
North America	61.0
Central & South America	101.2
Western Europe	16.2
Eastern Europe and Former S.U.	123.0
Middle East	733.9
Africa	112.2
Asia & Oceania	41.1
World Total	1,188.6

Table 1.2 World crude oil reserves (Billion barrels)

Source: BP, *Statistical Review of World Energy 2005*

There is some question about the exact size of world oil reserves. The Persian Gulf countries report reserves of 720 billion barrels. These figures have remained unchanged since the late 1980s, despite the sizeable production that has taken place since then. The cause for the doubts about the official reserve data of OPEC countries is OPEC's system of production quota, which was reshaped in the second half of the 1980s. From that point on, the reserve amount has also determined the share each OPEC member state is allowed to produce. This gives all member states an incentive to (artificially) boost their reserves, because it enlarges their claim to production quota. Western experts therefore doubt the proven reserves of the Persian Gulf countries. Governments of consuming countries have increased the pressure on the governments of the Gulf countries to become more transparent.

1.2. Oil supply and demand

In November 2004, world oil production was 82.5 million barrels a day (mb/d), an increase of some 10 million barrels since 1999.⁴ The IEA World Energy Outlook 2004 predicts oil supply to grow to 90 mb/d in 2010, 106 mb/d in 2020 and 121 mb/d in 2030.⁵ The share of OPEC in world oil production is predicted to increase sharply in the coming years. The lion's share of OPEC production comes from the countries of the Persian Gulf. Their share within OPEC will increase in the coming years, which is a reflection of the proven reserves of OPEC. The Persian Gulf countries are predicted to produce 22.5 mb/d of oil in 2010 (against 19 mb/d now). This will steadily rise to 37 mb/d in 2020 and 52 mb/d in 2030. The total OPEC production will be 33 mb/d in 2010, 50 mb/d in 2020 and 65 mb/d in 2030.⁶

³ Proven reserves can be produced economically with a 90% certainty, possible with a 50% certainty and possible with a 10% certainty against the oil price prevailing at the time of the reporting.

⁴ *Petroleum Economist*, January 2005, p. 48.

⁵ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 82.

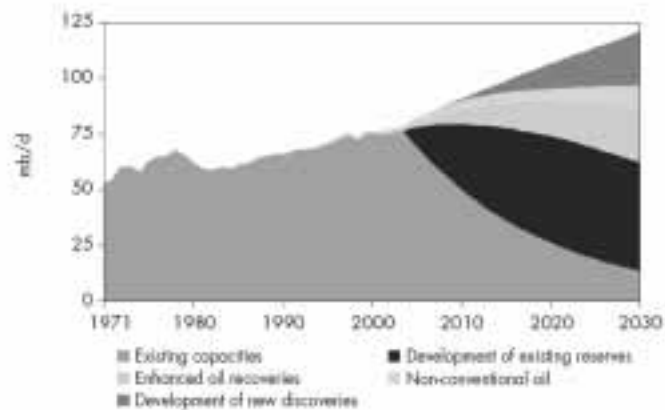


Figure 1.1 World oil production

Source: IEA, *World Energy Outlook 2004*

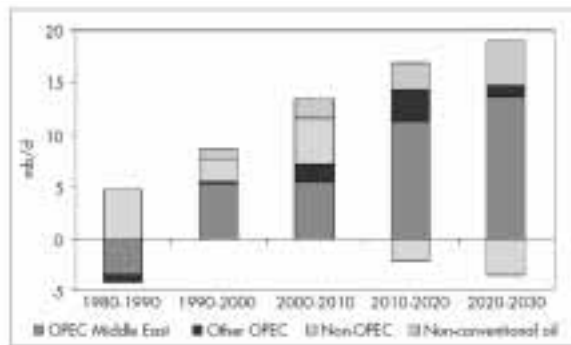


Figure 1.2 Change in world oil production

Source: IEA, *World Energy Outlook 2002*

The share of the OECD countries in world oil demand will decrease from 58% in 2000 to only 50% in 2020.⁷ The European Union's share will also decrease in relative terms. The EU demand now stands at 17.6% of world demand, and this share will decrease to 15.9% in 2010, 14.3% in 2020 and 12.8% in 2030, according to the IEA. In absolute terms, however, demand will grow modestly. Demand now stands at 13.6 mb/d, and will grow to 14.4 mb/d in 2010, 15.3 mb/d in 2020 and 15.6 mb/d in 2030. The European economy is less energy intensive than other developed industrial economies.⁸ The Kyoto Protocol puts further pressure on countries to reduce emissions (and therefore to consume energy more efficiently).

This reduction in the share of world consumption is due to the quickly increasing share of consumption of developing and transition countries. 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 viable alternatives for oil as a transportation fuel in these markets.⁹

⁶ Ibid.

⁷ Ibid.

⁸ For a comparison of the energy intensity of countries, see: IEA, *Key World Energy Statistics 2004*, Paris, OECD/IEA

⁹ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 82.

	2002	2010	2020	2030
US and Canada	985	1106	1231	1315
EU	648	687	729	743
OECD Pacific	398	426	449	453
Russia	128	149	171	199
China	247	375	503	636
India	119	160	215	267

Table 1.3 Future oil consumption in Mtoe

Source: IEA, *World Energy Outlook 2004, Reference Scenario*

Import dependence will grow substantially in all major consumer markets, except in Asian Pacific countries, where the import dependency is already very high (see figure 1.3). The growing import dependence has brought energy back onto the political agenda in consumer countries. The EU and East Asia are both heavily dependent upon two oil-exporting regions: Russia and the Middle East. Russia is the largest supplier for the European market, while the Middle East supplies the lion's share of the East Asian oil market. From a strategic and economic point of view it is considered undesirable to be overly dependent upon only one exporting region. Such a dependency increases the vulnerability to supply interruptions caused by technical and political calamities in the exporting region. These might be caused by political unrest, strikes, ethnic violence or natural disasters. In addition, underinvestment, mismanagement or an economic crisis in the exporting region could affect the availability of supplies. That is why all importing regions are looking to diversify the origins of their oil sources. Given the concentration of proven oil reserves, the possibilities for diversification are limited.

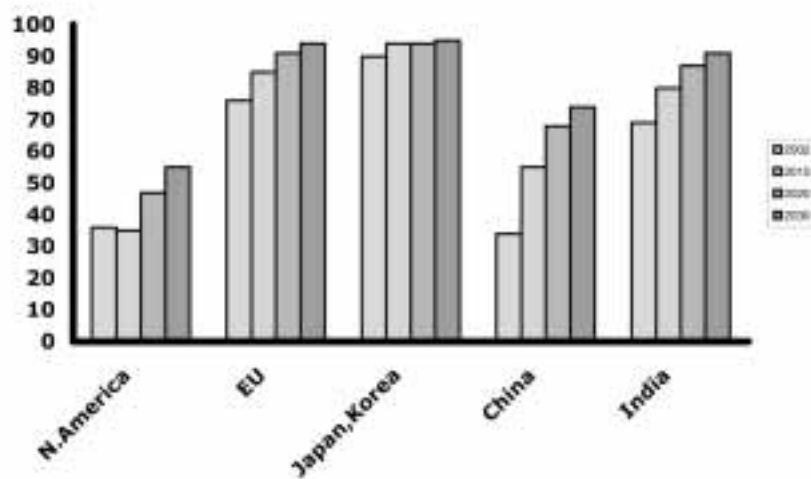


Figure 1.3 Oil Import Dependence by Region

Data: IEA, *World Energy Outlook 2004*

In 2004 the strong growth of demand created tight markets. The contribution of China and India to the growth of demand is substantial. Chinese GDP is expanding by 7-9% annually, which is accompanied by an unexpectedly steep increase in Chinese oil demand.¹⁰ Further contributors to demand growth are the traditional consumer countries such as the United States.

¹⁰ EIA, *Country Analysis brief: China, 2004*. <http://www.eia.doe.gov>.

The demand increase fuelled by China and India is limited by supply constraints. The producer countries could always meet earlier sudden demand increases, because there was always enough spare production capacity in the market. In the present situation spare capacity is very limited. Producing countries are producing at full or near full capacity to satisfy demand. In a situation of rising demand and supply constraints, prices must go up. This has led to a market of high oil prices.

The buyer's market of the 1980s and 1990s has shifted to a seller's market. Given the political tension in the world, politics matter again and oil flows could again become politically determined. For countries that counted on purchasing oil in the international market, where trade strips oil of its nationality, this might be a crucial change in international oil relations.

Although the general global trend is one of declining oil intensity, reflecting the growing efficiency in energy use around the world, consumption will nevertheless grow. The two principal drivers of demand growth - China and India - are emerging economies that are still in a very energy (oil)-intensive phase of development. The US and the EU are still the single largest consumer blocks (where demand is also increasing). China has become the largest consuming country in Asia, surpassing Japan, and now is the second largest consumer country after the US.

The International Energy Agency (IEA) forecasts oil demand to grow to about 106 mb/d by 2020. This poses a tremendous challenge to oil producers. Non-OPEC countries have raised their production gradually during the last 25 years, but now many of the traditional Non-OPEC producing regions are or soon will be past their peak production. Non-OPEC production is projected to grow only slightly, which implies that OPEC countries in particular need to expand their production substantially over the next 15 years.

Production capacity and the role of OPEC

OPEC plays a crucial role in this story, because OPEC, in particular Saudi Arabia and the UAE, has traditionally possessed the spare capacity to regulate markets and, subsequently, prices. OPEC is the swing producer. The ability of OPEC to control price levels with production policy has eroded in recent years because the spare capacity that is required for this role is needed to satisfy growing demand. OPEC's spare capacity was always around 5 million barrels per day, but this capacity shrank in 2004 to a mere 1 mb/d. Given the growth of demand, the capacity additions that are underway at the moment will only slow down the further decline of spare capacity. The oil price increase is the only instrument that can stop demand from growing any further. With the erosion of OPEC's role as a swing producer, the international oil market has also lost its buffer for sudden demand increases or calamities in oil supply.

Peak Oil

It is important to note that the uncertainties surrounding the reserves might have consequences for the availability of oil. It is uncertain when global oil production will reach its peak. There are two schools of thought; depletionists and anti-depletionists.¹¹ The most well-known representative of the former school is the Association for the Study of Peak Oil (ASPO). According to ASPO, the world could reach a peak of oil production as soon as 2008, and from then on production will decline.¹² ASPO claims that the peak coincides with the midpoint of depletion of reserves. The significance of the midpoint derives from strong historical evidence that shows that oil production peaks and then starts to decline when half of the recoverable resources have been consumed.¹³ If ASPO is correct, that would mean that world oil production will stall at a peak/maximum of around 85-90 mb/d, which is obviously not enough to meet the demand that the IEA projects in 2020.

¹¹ Australian Government, Department of Transport and Regional Services, *Is the world running out of oil?*, Commonwealth of Australia, 2005.

¹² "When oil peaks", *Asia Times Online*, 26 January 2005.

¹³ Australian Government, Department of Transport and Regional Services, *Is the world running out of oil?*, Commonwealth of Australia, 2005, p. 8.

The school of anti-depletionists is opposed to this reading, as they are far more optimistic about the remaining ultimately recoverable reserves. Because of the higher reserves, the world is not even close to its midpoint or peak. Anti-depletionists are more optimistic about how the oil industry will evolve over time, and expect that technological developments, efficiency gains and prices will all have a positive influence on the ability of the oil industry to produce oil that is presently uncommercial due to technological or economic constraints.¹⁴ While the depletionist school puts the ultimate recoverable reserves at 1.8 trillion barrels of oil, the anti-depletionists think that reserves are 3 trillion barrels of oil. The main reason for this large discrepancy in reserves is the difference in the understanding of the definition of reserves by these groups.

Refinery challenges

Not only the production of crude oil has seen a combination of low investments in new capacity and unexpected demand increase; the same is true for the refinery sector. In 2004 the capacity to refine crude oil was only marginally higher than the demand for crude oil.¹⁵ The availability of this capacity must increase in line with the rising demand for crude oil (from 83 mb/d in 2004 to 93 mb/d in 2010 and 118 mb/d in 2030).

In the past, production facilities were built close to consumer markets, but new environmental legislation has made this increasingly difficult, especially in OECD countries. Most new production facilities are being developed outside the OECD countries, in the areas where demand growth is the highest. Still, there is an expected increase in interregional trade of refined oil products from 10 mb/d in 2004 to 16 mb/d in 2030.¹⁶

Not only will the demand for refined oil products rise, there will also increasingly be a demand for light products suitable for transport sectors (road and air). The necessary plants are expensive and take time to plan and build.¹⁷ The demand for lighter and less sour (less acidic, i.e. containing less sulphur) products is further stimulated by government environmental regulation. At the same time, the supply of crude products will change. "On average, crude oil production is becoming heavier and more sour (containing more sulphur). Heavy, sour crudes are more difficult to process and yield more heavy products, which need additional processing".¹⁸

1.3. Investment

The erosion of (OPEC) spare capacity in the system can be partly explained by underinvestment in new production capacity. In the second half of the 1990s, oil prices were very low (around USD10-12 per barrel). In such a market environment international oil companies were reluctant to invest in exploration and production and consolidated their position, mainly through mergers and acquisitions. However, the underinvestment of the 1990s is now at the root of the present capacity constraints. Investment in oil production capacity and infrastructure is long-term, and it takes several years for projects to come on-stream. Another reason why capacity might not increase as quickly as the market would want is that international oil companies do not have access to most of the oil reserves in the Persian Gulf. Today only some 35% of world proven oil reserves are accessible to foreign direct investment. The rest is closed to foreigners and lies in the hands of national oil companies like Saudi Aramco, Kuwait Petroleum Corporation or Iraq National Oil Company.¹⁹ Moreover, despite the growth of demand, some OPEC countries might still be reluctant to increase production capacity because they cannot afford to invest in future idle capacity. Whereas the

¹⁴ Ibid.

¹⁵ IEA, *World Energy Outlook 2005*, Paris, OECD/IEA, p. 96.

¹⁶ Ibid., p. 101.

¹⁷ Ibid., page 97.

¹⁸ Ibid.

¹⁹ IEA, *World Energy Investment Outlook 2003*, Paris, OECD/IEA, p. 130.

Saudi Arabian side assures that they strive to bring down the oil price, president Chavez of Venezuela stated recently that the world can “forget about cheap oil”.²⁰

Regions that are open to foreign direct investors include Russia, West Africa and Mexico. These regions have their own challenges and risks, however. In Russia, the investment climate is considered suboptimal by many Western companies, which is why they have not been particularly active there. The recent Yukos-affair has lowered investor confidence in the country. It has spurred concerns over ownership rights. Western preparedness to invest has further declined by the recent measure of the Russian government to limit foreign participation in new projects; they can own only a minority stake (49% maximum).²¹ In some West-African countries, like Nigeria, political instability has motivated companies to focus predominantly on offshore investment projects.

1.4. Problems in producing countries

For some time now, scientists have wondered about the link between instability and producer states. Political scientists tend to refer to the ‘resource curse’, which widens the net since it includes similar problems experienced by other nations with rich soil and large endowments of natural resources. Simply said, the finding of oil in a poor country is similar to winning the lottery. Just as a lottery winner might abandon his job, the government of a petrostate makes so much money exporting petroleum that it doesn’t develop other industries. Part of the revenues is then used to shield citizens from painful processes like competition by subsidizing inefficient businesses and expanding government pay rolls. Ministers from important producer countries have made clear in the past that they were quite aware of the problems connected with their large deposits of oil. Sheik Yamani, then oil minister of Saudi Arabia, said for example: “All in all, I wish we had discovered water.”²²

The term ‘resource curse’ might be a bit misleading. There are many nations in the world with ample resources that are not affected by this curse, e.g., the United States and Norway. The task at hand for governments in producing countries is certainly not an easy one.

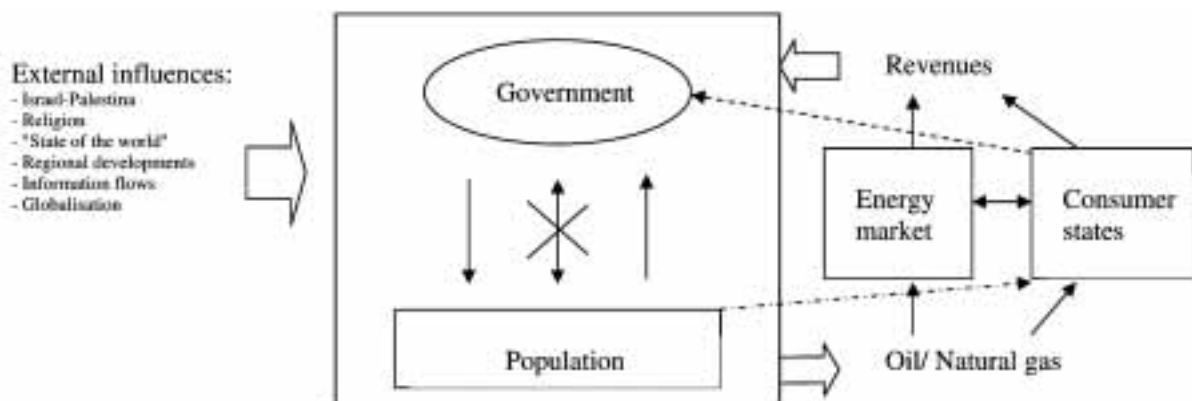


Figure 1.4 A model of the relationship between government and population in producing countries.

Source: CIEP²³

²⁰ “Chavez: low oil rates thing of the past”, cbsnews.com, 6 March 2005.

²¹ Janssen, E., *Can Russian oil growth be sustained?*, The Hague, CIEP briefing papers number 4, 2005.

²² The minister was citing a colleague in an interview with Terry Lynn Karl in 1979. In 1997 Karl published one of the most complete works on the problems of producing countries. Karl, T.L., *The paradox of plenty; Oil booms and petro-states*, Berkeley, California University Press, 1997.

²³ In the model, two different routes are visible: the influence of consumer countries through energy markets or a more direct relationship between consumer and producer countries.

Figure 1.4 is loosely based on models of ‘indirect rule’, a term used to describe the way the United Kingdom managed its affairs with her colonies.²⁴ In a system of indirect rule, the mother country breaks the relationship between government and population in a colony. The situation in producing countries can be analysed along similar lines, where oil revenues and sometimes direct involvement by consumer states replace the mother country. In virtually all producing countries, there is a disturbed relationship between government (or groups that control the government) and the rest of the population. For a variety of historical reasons, which differ per state, governments in producing countries suffer from a lack of legitimacy. More importantly, it seems that a situation of mutual dependency between government and population has never come into existence, precisely because of the presence of a guaranteed money flow, namely the revenues from oil and gas exports. The government seeks legitimacy by using oil dollars to provide for a social welfare system and good education facilities, but this is sometimes in combination with extensive security and intelligence agencies to keep the population literally under control. This can lead to a situation of oppression, human rights violations, etc.

A relationship in the other direction, from population to government, also develops. In general, the methods of the population can be called ‘weapons of the weak’.²⁵ The range of possible ‘weapons’ starts with strikes and non-violent sabotage and ends with full-scale civil war. In between lie medium-scale attempts such as local uprisings and terrorism. The relationship of population to government does not necessarily develop as a reaction to the actions of the government. The weak legitimacy of the government will mean that groups in a population will probably find reasons for uprisings, especially if the economy is not developing fast enough or if income per capita is declining. An extra and quite common problem is relative deprivation. Either minorities or local groups from producing regions can hold the perception that they are being neglected in comparison to other groups and regions. Whether this is actually the case is not important. The perception is what matters.

The dependency of producer countries upon oil revenues has remained very high. Attempts to diversify the economy have failed. For countries such as Saudi Arabia and Nigeria, more than 90% of exports consist of oil and oil products.²⁶ In 2000, 30% of Algeria’s GDP came from the energy sector as well as 77% of the government’s earnings and 97% of the export earnings.²⁷ The current high oil prices will, in the short run at least, only increase the dependency.

Producer countries are confronted with multiple domestic social problems.²⁸ The countries around the Persian Gulf, for example, have seen a sharp increase in population growth. The GDP per capita has decreased over a period of twenty years. The GDP per capita of the United Arab Emirates peaked at USD44,000 in 1974. In 2000 the GDP per capita was USD17,500. The GDP per capita of Saudi Arabia peaked a few years later, in 1980, at USD11,000. In 2000 it had declined to USD6,000. Iraq performed the worst, not surprisingly considering the many conflicts the country has endured. From a peak just before the Iraq-Iran wars in 1979 of USD32,500 per capita, the GDP dropped to roughly USD3,000 in

²⁴ This term was described in: Lugard, F., *The Dual Mandate in British Tropical Africa*, Blackwood and Sons, 1922. The term has also been used to describe decentralised governance structure within nation states, for example in the article by Hecter, M. and Kabiri, N., *Attaining Social Order in Iraq*, October 27 2004. <http://faculty.washington.edu/hechter/AttainingSocialOrderInIraq.pdf>.

²⁵ The term comes from the anthropologist James C. Scott. Scott, J.C., *Weapons of the Weak: Everyday forms of peasant resistance*, Yale University Press, 1985.

²⁶ EIA, *Nigeria Country Analysis Brief*, 1 September 2003; and EIA, *Saudi Arabia Country Analysis Brief*, 22 June 2004, <http://www.eia.doe.gov>.

²⁷ IMF, *Country Report No. 01/163, 2001; Algeria*, Statistical Appendix.

²⁸ For an overview of problems in Arab countries, not necessarily producing countries, see UNDP, *Arab Human Development Report 2003; Building a Knowledge Society*.

2000.²⁹ The young population, in combination with relatively high education levels and a lack of suitable job opportunities, is a source of tension, a “demographic time bomb”.³⁰

A final element is the perception by citizens of producing countries of the role of consumer countries. Oil revenues form the lifeline of current regimes. These revenues stem from consumer states. Historically, consumer states have attempted to directly influence the political situation in producing countries. The simple flow of revenues means that there is indirect involvement. Logically, the frustration felt by the population of producing countries is also directed against consumer countries. Businesses become the target of violence and terrorism. Consumer states are at least partially blamed for existing problems and the lack of possibilities to change the situation.

The numbers of countries that fit the broad description indicated above are many. The recent problems in Venezuela, Bolivia and Nigeria can be explained by viewing them in light of the model represented in figure 1.4. In the case of Iraq the model also seems quite suitable, which makes the hope for a quick stabilisation of the situation rather idle. The whole idea of ‘weapons of the weak’ is far from new, of course. The weapons have increased in firepower, however. Violence, attacks and bombings with many casualties in producing countries have a direct effect on the energy markets, and particularly oil since the market has become quite tight since 2004. Local unrest is more likely to cause oil disruption than regional conflicts, with the notable exception of the tension caused by the nuclear programme of the Islamic Republic of Iran and its possible consequences.

1.5. Most important factors influencing the oil market

Economic factors	Environmental factors	(Geo)political factors
Facts <ul style="list-style-type: none"> • Lack of investments in 1990s <ul style="list-style-type: none"> – Exploration – Production – Refining • Choke points in transport Facts influencing EU Position <ul style="list-style-type: none"> • EU less important as a consumer Factors for energy diplomacy with other consumer states <ul style="list-style-type: none"> • Current and future demand growth in China, India and US Factors energy diplomacy with producers states <ul style="list-style-type: none"> • Access for investments (investment climate) • Uncertainties over reserves 	Factors energy diplomacy with producers states <ul style="list-style-type: none"> • Production <ul style="list-style-type: none"> – Footprint – Accidents Factors energy diplomacy with producers, transit and consumer states <ul style="list-style-type: none"> • Transport routes <ul style="list-style-type: none"> – Footprint – Accidents Factors energy diplomacy with producer and consumer countries <ul style="list-style-type: none"> • Climate change <ul style="list-style-type: none"> – Flaring – Efficiency – Consumption 	Facts <ul style="list-style-type: none"> • Concentration in only a few regions (esp. Persian Gulf) • Import dependency consumer countries Factors for energy diplomacy with other consumer states <ul style="list-style-type: none"> • Competition between consumer countries Factors for energy policy with producers and consumer states <ul style="list-style-type: none"> • Political stability and situation producing countries • Uncertainties over reserves Factors for energy policy with producers, transit and consumer states <ul style="list-style-type: none"> • Security concerns <ul style="list-style-type: none"> – Production – Infrastructure – Transit routes (sea lanes)

Table 1.4 Factors influencing the production, transport, consumption, politics and price of oil

²⁹ IEA, *Non-OECD Countries Statistics 2002*, Paris, OECD/IEA. All figures are in 1995 USD and exchange rates, without PPP adjustments. It is unclear how reliable the data on Iraq is.

³⁰ CIEP, *Study on energy supply security and geopolitics*, The Hague, CIEP, 2004.

2

Demand, supply and transit of natural gas and LNG

Natural gas markets have been developed on the basis of the availability of domestic resources, the wish of governments to substitute for other energy carriers, or both. In Europe, for instance, the discovery of the giant Groningen field and the desire of the Dutch government and international oil companies to monetize these resources initiated the development of the European natural gas market. In contrast, the Japanese gas market was developed later purely on the basis of imports in order to decrease dependency upon imported oil and to cope with environmental problems.¹

The handling advantages of natural gas compared to other fuels made gas popular, and pricing approaches which linked natural gas prices to oil product prices made sure that customers never paid more than for the alternative fuel, but that the gas industry also never got less than the value of competing fuels. Thus, the combination of favourable government policies, the simple wish to monetize resources and advantages for customers led to a sustained growth of natural gas markets globally.

2.1. Gas Reserves and Production

The world gas reserves are less concentrated than 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 the world's proven gas reserves. These reserves are matched by the proven gas reserves in the Middle East. Iran has especially large reserves, about 15% of the world's 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 65 years, compared to about a little over 40 years for oil.²

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 prediction that demand for gas will 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, perhaps also the Chinese market.

¹ Compare Correljé, A., Van der Linde, C. and Westerwoudt, T., *Natural gas in the Netherlands*, Amsterdam/ The Hague, ONG/ CIEP, 2003 and Miyamoto, A., "Natural Gas in Japan", In: Wybrew-Bond, I. and Stern, J., *Natural Gas in Asia*, Oxford, Oxford Institute for Energy Studies, 2002, pp. 106-187.

² BP, *Statistical Review of World Energy 2005*, p. 8 and 24, <http://www.bp.com>.

Continent/region	BP Year-end 2004
North America	7.32
Central & South America	7.10
Western Europe	4.93
Eastern Europe and the F.S.U.	58.00
Middle East	72.83
Africa	14.06
Asia & Oceania	14.21

Table 2.1 World proven Natural Gas Reserves (trillion cubic meters)

Source: BP Statistical Review of World Energy, 2005

Contrary to the gas reserves of the former Soviet Union, the gas reserves of the Middle East have hardly been developed, since the cost of bringing the gas from the Middle East to the market was too great. Only in the past decade were Liquefied Natural Gas (LNG, see below) projects in Qatar and Oman developed to export gas.

	2002	2010	2020	2030
US and Canada	612	692	787	845
EU	389	468	565	649
OECD Pacific	113	151	189	216
Russia	326	371	433	489
China	36	59	107	158
India	23	37	63	90

Table 2.2 Future gas consumption in Mtoe

Source: IEA, World Energy Outlook 2004, reference scenario

Among the large consuming regions, North America, Europe and China have significant domestic gas resources. However, gas production in North America is projected to fall and European gas production will at best remain constant over the next decade, with strongly increased Norwegian production making up for dwindling production in the United Kingdom and, to a lesser extent, in the Netherlands, Germany and other countries. In China, reserves are concentrated in the west, far away from the demand centres in the east, making LNG imports appear more economical. In all three markets demand for natural gas is rising, so that they all will become more import dependent and will probably increasingly rely upon the main resource-holding regions.

	2002	2010	2030
OECD North America	0	4	18
OECD Europe	36	46	65
OECD Asia	98	97	94
China	0	15	27
India	0	23	40
EU	49	60	81

Table 2.3 Future gas import dependence as percentage of future gas consumption

Source: IEA, *World Energy Outlook 2004*, reference scenario

2.2. Gas transportation and trade: increasing importance of LNG

Generally, transportation of gas is the largest cost factor in bringing gas from the gas reservoir to the customer. Because of the fact that pipelines have long been the most economical means for long-distance gas transport, natural gas markets are regional rather than global. Only in Asia, where geography has made pipeline transport impossible, has natural gas long been transported in liquefied form as LNG.³ However, rising gas prices and large cost reductions in all parts of the LNG chain have made it increasingly economical to transport natural gas in liquefied form over large distances with more destination flexibility, opening up the possibility of the gas market becoming more global.

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 the market.

Costs are not the only determinant for the choice between LNG and pipeline supply. Other factors, which may at times tip the balance towards an LNG project, 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 so far 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 accept 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 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 unite to acquire the supply from one pipeline.

³ The LNG chain comprises cooling natural gas to a temperature of -160°C, thereby liquefying it, shipping it on tankers and regasifying it in the harbour of destination, where it can be injected into regular pipeline networks.

- However, 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.⁴

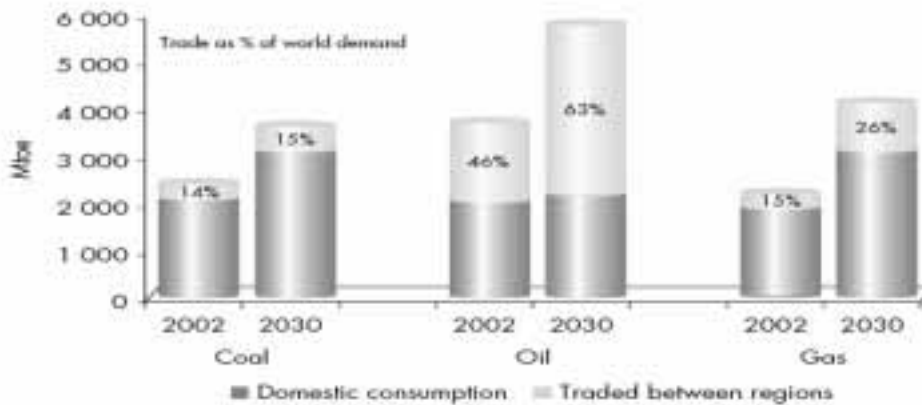


Figure 2.1 Share of Net Inter-Regional Trade in World Fossil-Fuel Supply

Source: IEA, *World Energy Outlook 2004*.

The growth in the LNG market is certainly driven by the growing demand in the OECD and developing countries' markets for gas and the distribution of gas reserves in the world. Until recently, much of the world gas reserves were considered to be 'stranded', meaning that they could not be brought profitably to the market. Higher prices for natural gas and particularly the cost reductions that were realized in the LNG sector now make it possible to profitably market at least some of the gas reserves. In order to provide financial certainty, most LNG projects are contractually linked to a certain export market. Thus the flexibility in export destination, notwithstanding restrictions in import capacity, is limited. However, market parties - producers as well as principal buyers - increasingly exploit arbitrage possibilities between various regional markets by diverting LNG cargoes in short-term transactions to the markets offering the higher price.⁵ These volumes are still comparatively small. There is a dispute going on about how much flexibility can be expected in the medium-term, with respect to destination flexibility providing for a truly global market with converging prices.

2.3. Gas Demand

In 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. As said before, 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.

Power generation, however, is seen as the main driving influence behind demand for natural gas globally. Combined Cycle Gas Turbines, introduced in the 1980s and constantly improved ever since, are considered the default power generation technology for new plants where gas is available at competitive prices. They are very efficient, can be constructed more quickly and are much less capital-intensive than coal or

⁴ CIEP, *The role of Liquefied Natural Gas (LNG) in the European Gas Market*, The Hague, CIEP, 2003, <http://www.clingendael.nl/ciep>

⁵ More precisely, to the market offering the higher netback value (price corrected for transport and handling cost differences).

nuclear power plants. An additional incentive for using natural gas in power generation comes from measures to control greenhouse gas emissions, such as the European Emission Trading Scheme, because CCGT power plants emit about half the CO₂ that a coal-fired power plant emits per unit of electricity produced.⁶ Politicians, however, might become increasingly concerned about both the home heating market and the power generation sector becoming increasingly dependent on imported gas. This could lead to the creation of policies aimed at limiting growth in gas demand. All in all, global demand for natural gas is projected to increase about 2.5% annually.⁷

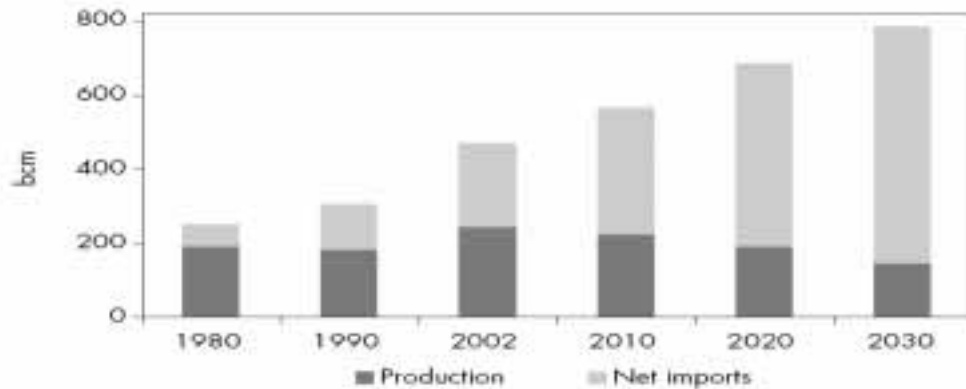


Figure 2.2 European Union: Natural Gas Import Dependence

Source: IEA, *World Energy Outlook 2004*.

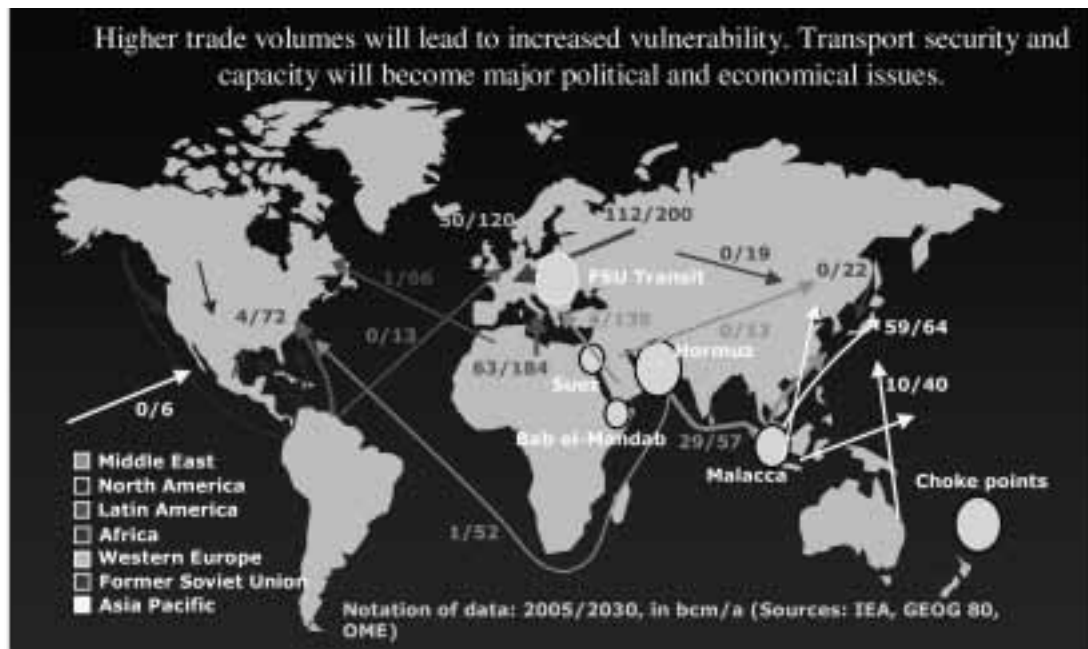


Figure 2.3 Natural Gas Trade Flows

⁶ The economics of CCGTs are very sensitive to gas price fluctuations, however. Whether the demand growth projections will be realised depends very much upon the view that potential investors take on the long-run development of the gas/coal price relationship.

⁷ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA. European gas demand is projected to increase annually by about 2% up until 2020. For a recent overview of European gas demand projections see Tönjes, C. *Gas to Power in Europe*, The Hague, CIEP, April 2005, <http://www.clingendael.nl/ciep>

The growing demand for gas in North America, Europe and Asia and the growing call for gas supplies from elsewhere will greatly impact the size and intensity of interregional gas flows. The development of the precise gas flows depends largely upon the sequence with which gas projects are brought on stream. The market will not be able to absorb many new sources at the same time due developments in the electricity market and the high capital investments in infrastructure. Security of supply and security of demand are closely linked in these developments.

2.4. Most important factors influencing the natural gas market

Economic factors	Environmental factors	(Geo)political factors
<p>Facts</p> <ul style="list-style-type: none"> • Trade through pipelines regionally based • Trade through LNG increasing, more global competition • Possible choke points in transport • High investments, stronger connection between supplier and consumer <p>Facts influencing EU Position</p> <ul style="list-style-type: none"> • EU less important as a consumer <p>Factors for energy diplomacy with other consumer states</p> <ul style="list-style-type: none"> • Current and future demand growth in China, India and US. <p>Factors energy diplomacy with producers states</p> <ul style="list-style-type: none"> • Access for investments (investment climate) 	<p>Factors energy diplomacy with producers states</p> <ul style="list-style-type: none"> • Production • Footprint • Accidents <p>Factors energy diplomacy with producers, transit and consumer states</p> <ul style="list-style-type: none"> • Transport routes • Footprint • Accidents <p>Factors energy diplomacy with producer and consumer countries</p> <ul style="list-style-type: none"> • Climate change • Flaring • Efficiency • Consumption 	<p>Facts</p> <ul style="list-style-type: none"> • Concentration in Russia, Caspian Sea and Persian Gulf • Import dependency consumer countries <p>Factors for energy diplomacy with other consumer states</p> <ul style="list-style-type: none"> • Some competition between consumer countries <p>Factors for energy policy with producers and consumer states</p> <ul style="list-style-type: none"> • Political stability and situation producing countries <p>Factors for energy policy with producers, transit and consumer states</p> <ul style="list-style-type: none"> • Security concerns <ul style="list-style-type: none"> – Production – Infrastructure – Transit routes (pipelines)

Table 2.4 Factors influencing the production, transport, consumption, politics and price of natural gas

3

Demand, supply and transit of coal

3.1. Coal supply and demand

Coal reserves are equally distributed around the globe. Important consumers such as China also have the largest production. In recent years there has been some competition along with higher prices due to the growth of demand in China that could not be matched locally due to production and infrastructural problems.

Continent/ region	BP Year-end 2004
North America	254432
Central & South America	19893
Western Europe	11404
Eastern Europe and Eurasia	275691
Middle East	419
Africa	50336
Asia Pacific	296889
World Total	909064

Table 3.1 Coal reserves (million metric tons)

Source: BP/ Shell

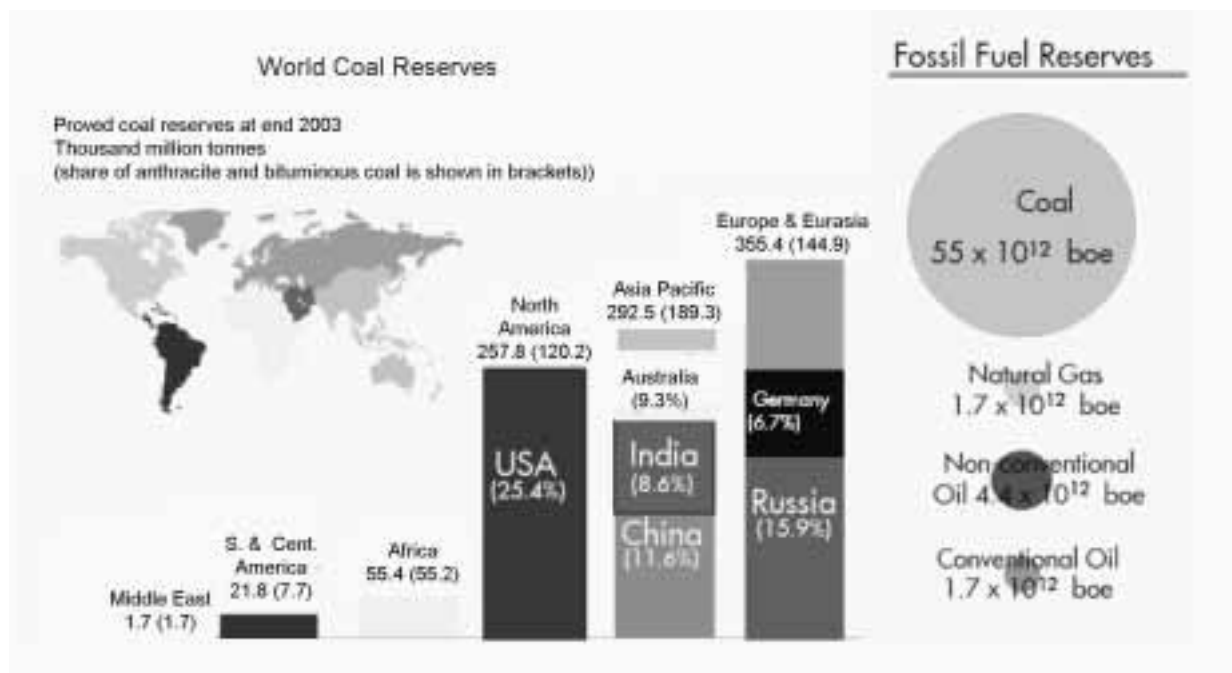


Figure 3.1 Coal reserves remain dominant in the long term

Source: BP/Shell

Of the fossil fuels, coal has the largest remaining reserves. It also has by far the highest production/reserves ratio, exceeding 200 years. Its availability marks coal as one of the most important fuels for the future. At the same time it is the dirtiest of the fossil fuels, both at local levels as well as globally, since it produces high levels of greenhouse gas emissions. Developing technologies to clean the use of coal should be high on international research agendas. Reducing the costs of converting coal to liquids (CtL), to make it available as a viable option for oil products in the transport sector should also be researched. Clean coal technology could be shared/traded with other (non-Western) producing and consuming countries.

	2002	2010	2020	2030
US and Canada	570	625	645	662
EU	303	307	307	274
OECD Pacific	196	210	226	221
Russia	107	118	125	117
China	713	904	1119	1354
India	178	207	271	362

Table 3.2 Future coal consumption in Mtoe

Source: IEA, *World Energy Outlook 2004, Reference Scenario*

3.2. Most important factors influencing the coal market

Economic factors	Environmental factors	(Geo)political factors
Facts <ul style="list-style-type: none"> • Regional trade Factors for energy diplomacy with other consumer states <ul style="list-style-type: none"> • Current and future demand growth especially in China 	Factors energy diplomacy with producer states <ul style="list-style-type: none"> • Production <ul style="list-style-type: none"> – Footprint – Accidents/safety Factors energy diplomacy with producer and consumer countries <ul style="list-style-type: none"> • Climate change <ul style="list-style-type: none"> – Efficiency/technology – Consumption 	Facts <ul style="list-style-type: none"> • Coal reserves relatively equally divided globally, important consumers have large reserves

Table 3.3 Factors influencing the production, transport, consumption, politics and price of coal

4

Demand, supply and transit of nuclear energy

4.1. Demand and supply

Following World War II, the world's major powers financed extensive military nuclear research programmes. Technologies developed were later used for civil nuclear engineering. Most nuclear power plants were ordered before 1973.¹ The oil crisis did increase the popularity of nuclear power, but overall energy demand declined. The United States has roughly 30% of global nuclear capacity, France around 15%.² In the EU, nuclear power accounts for 36% of the electricity consumed.³

Nuclear power plants require high capital investments, and the fall of oil prices in the mid-1980s and liberalisation processes in the US and Europe in the 1990s have had a negative impact on the competitive position of new power plants. Negative public opinion, caused by the long-term problem of nuclear waste and concerns about safety in the wake of the Chernobyl disaster, caused the building of new plants to virtually stop. Until a few years ago, the future of nuclear energy was only seen in a few Asian countries such as Japan, since Japan is almost totally energy import-dependent. European countries have plans to phase out nuclear energy. However, nuclear energy has recently been returning to policy agendas, both in the US and in a number of EU countries. Nuclear energy contributes to security of supply and deals radically with one particular environmental concern, CO₂ emissions.

Although the pros and cons of nuclear power have not really changed, concerns about security of supply and climate change have. In deregulated markets, nuclear power is not the most cost effective option, although technical developments and CO₂ pricing might improve the competitiveness of nuclear compared to natural gas and coal.⁴ Safety of the plants remains an issue as well, although new reactor designs have few safety risks. New types of reactors, such as the pebble-bed reactor that will be built in China, pose much smaller risks of serious accidents.⁵ Storage of nuclear waste also plays a prominent role in the public debate. Public perception is the single critical factor still preventing the emergence of nuclear energy on a large scale. A number of EU countries have announced plans to phase out nuclear energy altogether whereas others, such as France and Finland, have decided to expand their nuclear capacities. More generally speaking, nuclear policies in most EU-states are again under evaluation.

The different elements of the nuclear fuel cycle have different safety and security risks. Safety in particular is an issue in waste management due to the long lifetimes of the fission products. Despite extensive research programmes, there are as yet no final disposal facilities for high-level waste in operation. The greatest concerns, however, are in security issues, particularly with enrichment and reprocessing plants. In these plants natural uranium is turned into 3-5% enriched uranium, and spent fuel is reprocessed into recyclable fissile materials, including plutonium. Both technologies can be used for military purposes as well. "Power reactors are not themselves the major proliferation threat; enrichment and reprocessing plants are."⁶

¹ 60% of the plants in OECD countries. IEA *Nuclear power in the OECD*, Paris, OECD/IEA, 2001, p. 100.

² RWE, *Weltenergiereport 2003*.

³ IEA, *Electricity Information 2002*, Paris: OECD/IEA.

⁴ MIT, *The Future of Nuclear Power; an Interdisciplinary MIT Study*, MIT, 2003. pp. 37-45.

⁵ "China to pioneer 'pebble-bed' N-reactor", *Financial Times*, 7 February 2005.

⁶ Greenwald, J.M., "Keeping the nuclear power option open", In: *Oxford Energy Forum*, May 2005, issue 61, p. 5.

The fear of Western countries is that ‘rogue states’ will use nuclear technology not only for building power plants, but also for the development of nuclear weapons. This is why Western countries have put strong non-proliferation conditions on the trade in nuclear materials and in particular to the transfers of sensitive technologies regarding enrichment and reprocessing. There are more general Western concerns regarding trade in nuclear technology and raw materials from Russia to India and Iran. Trade in nuclear technology and material is traditionally a hot item in international relations and diplomacy, and pressure is exerted upon countries trading it. Non-proliferation is in the short run especially problematic in the case of North Korea and Iran. Experts and commentators have already indicated that the current non-proliferation regime might be inadequate.⁷ The United States especially, but also the EU, consider just the possession of nuclear technology and raw materials in the hands of hostile regimes a major threat to their national security.⁸

In discussions among experts, alternative fuel cycles are suggested, mainly with respect to limiting the risks of nuclear weapons proliferation. Since the late 1970s the option of the “Once-Through Cycle” has been strongly suggested.⁹ It means that no reprocessing will be done, refraining from further use of separated plutonium, for instance in breeder reactors. In this cycle, plutonium will remain in the spent fuel elements. This might reduce the chances of proliferation, at least in the short term, since there will be a ‘plutonium mine’ instead of a ‘plutonium river’. Full assessments of these and other fuel cycle options will have to take into account the uranium reserve situation. Exploration has practically come to a standstill due to limited prospects for nuclear energy, but most experts believe that there are ample resources available, with interesting geopolitical conditions, since many of these reserves are located in a variety of countries, such as Australia, Canada and South-Africa, in addition to Russia, the US and some Asian countries.

Research efforts have recently been strengthened, such as on inherently safe reactor designs (the large multinational G-IV project, where the US is cooperating with the EU, individual European countries and Japan), and on nuclear fusion. In theory, nuclear fusion power plants could generate large amounts of energy. So far the technology and process to create the perfect circumstances for nuclear fusion cost more energy than the fusion produces. Commercial availability of such power plants is still decades away.¹⁰ An international consortium, headed by the EU, including Russia, the US and Japan, is doing research. The next large demonstration facility will be built in France. The location of the facility had been a point of discussion for more than two years before it was granted to France earlier this year.

⁷ For example, Van Ham, P., “Nuclear Iran is niet te voorkomen”, in: *NRC Handelsblad*, 9 August 2005.

⁸ See for a discussion on non-proliferation in the future: Lubbers, R., *Moving beyond the stalemate : addressing the nuclear challenge by supranational means*, The Hague, CIEP Briefing papers number 3, 2005, <http://www.clingendael.nl/ciep>.

⁹ MIT, *The Future of Nuclear Power; an Interdisciplinary MIT Study*, MIT, 2003. pp. 29-35.

¹⁰ Boyle, G., Everett, B. and Ramage, J. (eds), *Energy systems and sustainability*, Oxford, Oxford University Press, 2003. p. 19.

4.2. Most important factors influencing nuclear energy

Economic factors	Environmental/ security factors	(Geo)political factors
<p>Facts</p> <p>Nuclear energy relatively uneconomic in liberalised markets</p> <ul style="list-style-type: none"> • High capital costs versus low fuel costs • Effect of CO₂ EAs uncertain 	<p>Factors energy diplomacy with non-nuclear states in addition to producer/ consumer states</p> <ul style="list-style-type: none"> • cross-border issues (accidents/ safety) • international waste repositories? • proliferation risks (enrichment, re-processing plants) • export regimes for sensitive technologies & materials 	<p>Facts</p> <ul style="list-style-type: none"> • Natural uranium deposits relatively equally distributed around the world, still some uncertainties about the quantities of the reserves. <p>Factors energy diplomacy with producer/ consumer states</p> <ul style="list-style-type: none"> • Non-proliferation • Research into new reactors and nuclear fusion

Table 4.1 Factors influencing the production, transport, consumption, politics and price of nuclear energy

5

Renewable energy sources

5.1. Renewables outlook

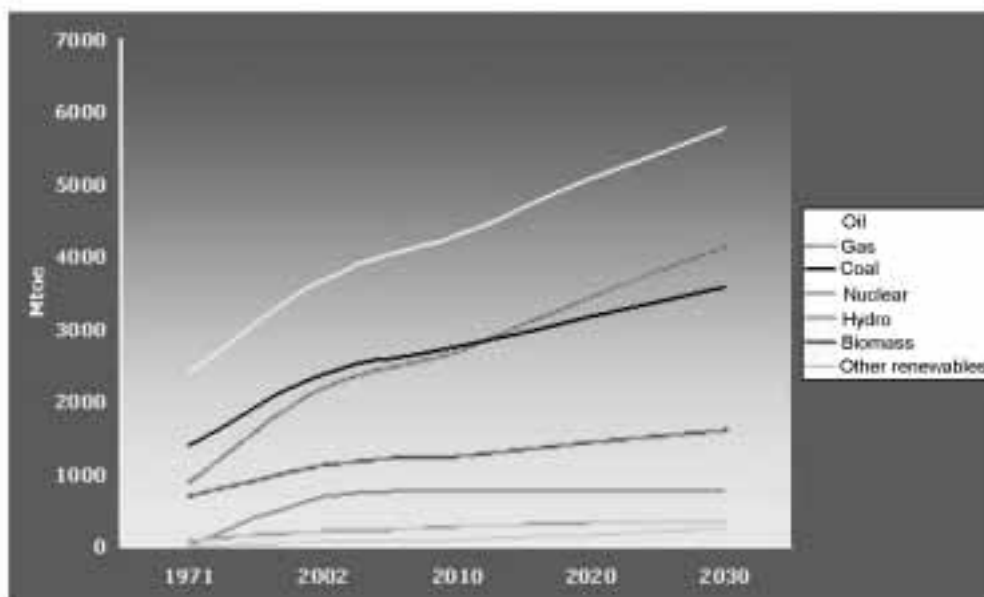


Figure 5.1 World primary energy demand.

Data: IEA WEO 2004

Renewable energy sources will become more important in the future, but their success is highly dependent upon technological breakthroughs, governmental support and the integration of environmental costs in energy prices. The share of renewable energy has increased in the past decades, but the impact is still very small. The notable exceptions are hydropower and biomass. The latter includes traditional use of biomass and is not necessarily very environmentally friendly. Renewables (hydropower, biomass and waste, excluding traditional use of biomass and other renewables) accounted for 6.07% of total primary energy demand in 2002. With the current policies in place it will increase to 7.91% in 2030.¹ Of course, the current high oil prices, the increases in CO₂ prices and future innovations may alter the outlook considerably. Fossil fuels will remain dominant, however, for the first half of the 21st century.

There are three reasons why the promotion of renewable energies is so important. First is the finite nature of oil and natural gas supplies. Second is the pollution caused by the use of fossil fuels. And third, there are potential problems surrounding security of supply with oil and natural gas. Unfortunately, with the exception of bio fuels, renewable energy is only applicable in the power sector. This will not decrease oil dependency. The possibilities for large-scale promotion of renewables are difficult in liberalised markets

¹ Hydropower accounts for 2.1% of total primary energy demand in 2002. In 2030 it will be 2.21%. Biomass, excluding traditional use, makes up 3.44% in 2002 and 4.15% in 2030. Other renewables, such as wind and solar, account for 0.53% in 2002 and 1.55% in 2030. Source: IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, p. 59.

with retreating government, such as in The Netherlands. In the coming ten years, energy efficiency and bio fuels will be the most viable options.

5.2. Most important factors influencing renewables

Economic factors	Environmental/ safety factors	(Geo)political factors
<p>Facts</p> <ul style="list-style-type: none"> • More expensive than fossil fuel options • Renewables are and will remain only a small share of total energy consumption. <p>Factors for energy diplomacy with other consumer states</p> <p>Promotion of renewable energy technology and energy efficiency in developing countries and other consumer states</p>	<p>Factors for energy diplomacy with producer states</p> <ul style="list-style-type: none"> • Decrease particles in the air • Decrease GHG emissions 	<p>Facts</p> <ul style="list-style-type: none"> • Potentially decreases import dependency of consumer states • Decreases the position of fossil fuel producing countries

Table 5.1 Factors influencing the production, transport, consumption, politics and price of renewables

6

EU energy demand and supply outlook

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's energy needs will increase 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 upon economic growth. However, there will be rather wide variation among individual countries regarding the patterns of efficiency improvement, industrial restructuring and the consequent growth in energy demand. Focusing on the EU-15, the European Commission's Green Paper predicts total primary energy demand to grow by around 11% from 1,454 million tons of oil equivalent (mtoe) in 2000, to around 1,600 mtoe by 2020.¹

6.1. EU energy mix

Increasing gas demand in the EU could imply that a high dependence upon oil imports will be replaced by a high dependence upon both oil and gas imports, because Europe will not be able to supply sufficient gas from indigenous sources. Recently, the growing dependence upon fuel imports from outside Europe has regained attention. This, however, has not yet translated into clear and consistent positions or policies across the European Union member states. 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.

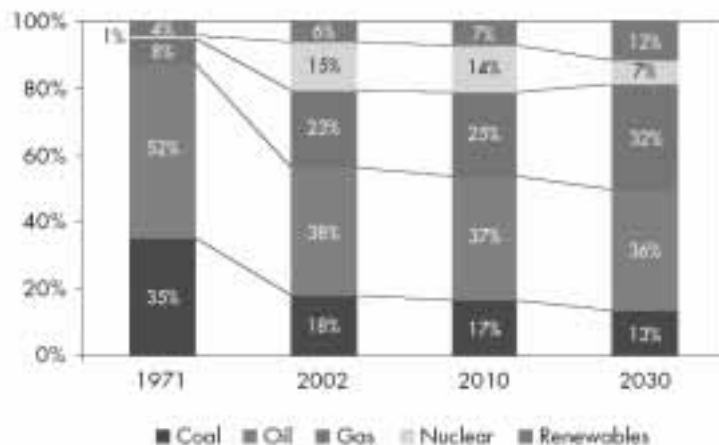


Figure 6.1 Total primary energy demand in the European Union

Source: IEA, *World Energy Outlook 2004*

Despite the growing amount of renewable energy, the share of fossil fuels will increase, due to the phasing out of nuclear energy in most member states. The use of coal is also decreasing, due to the pollution that the burning of coal produces. Sixty-six percent of the EU energy consumption will consist of oil and natural gas, most of which has to be imported.

¹ European Commission, *Towards a European strategy for security of energy supply* (COM 769 final), 2001.

Total Primary Energy Supply (per fuel type)	Oil		Natural Gas		Coal		Nuclear		Hydro		Total Mtoe
	Mtoe	%	Mtoe	%	Mtoe	%	Mtoe	%	Mtoe	%	
France	94,0	35,8	40,2	15,3	12,5	4,8	101,4	38,6	14,8	5,6	262,9
Germany	123,6	37,4	77,3	23,4	85,7	25,9	37,8	11,4	6,1	1,8	330,4
Italy	89,5	48,7	66,0	35,9	17,1	9,3	0,0	0,0	11,0	6,0	183,6
Netherlands	46,2	48,5	39,1	41,0	9,1	9,5	0,9	0,9	^	^	95,3
Poland	21,3	23,2	11,9	13,0	57,7	62,9	0,0	0,0	0,8	0,9	91,8
Spain	77,6	53,3	24,6	16,9	21,1	14,5	14,3	9,8	7,9	5,4	145,5
United Kingdom	80,8	35,6	88,2	38,9	38,1	16,8	18,1	8,0	1,7	0,7	226,9

^ smaller than 0.05

Table 6.1: Total primary energy supply for selected EU member states

Source: BP Statistical review of World Energy 2005

6.2. Oil stocks²

Within the European Union several directives concerning strategic stockpiling measures were formulated in reaction to the events of 1956, 1967 and the early 1970s, but these measures proved to be insufficient for coping with the direct effects of the first oil crisis in 1973. When the Organisation of Arab Petroleum Exporting Countries (OAPEC), Europe's main supplier at that time, reduced oil deliveries while demand was increasing, severe shortages on the international oil market were created.³ The Netherlands, as well as the US and Portugal, faced an embargo that further deepened the supply crisis.⁴ The other European Member States concentrated on securing their own energy supply, in particular oil supplies, instead of coming to the assistance of The Netherlands. France, Italy and West Germany entered into contracts with oil producing countries, safeguarding their supply of oil, mainly in exchange for military equipment. However, the business efforts of international oil companies still brought significant volumes of non-OAPEC oil to the countries facing embargo so that, overall, the effects of the embargo were distributed over all consuming countries.

At that time oil accounted for 62% of the European Community's primary energy use, and 97% of that oil had to be imported. Moreover, imports were derived to a large extent from the Middle East and North Africa. At the Copenhagen Summit (December 1973), in the light of the oil crisis, the Member States of the European Community were guided by the belief that "reliable and lasting supply [of energy] on economically satisfactory terms" could no longer be achieved while being so dependent upon oil from a limited number of sources. A diversification strategy with respect to energy carriers and import origins was considered of utmost importance, even if that meant initially higher costs.

Apart from the recognised need for a diversification strategy, a Euro-Arab Dialogue (EAD) was proposed which included the introduction of political, economic and cultural relations between the European Community and the Arab League. France especially was in favour of such a dialogue, which strongly contrasted with US interests. Given the heavy import dependence of the European Community, the US feared that European countries would be forced to give in on political and economic issues to Arab positions.⁵

² Based upon Willenborg, R., Tönjes C., and Perlot, W., *Europe's oil defences; An analysis of Europe's oil supply vulnerability and its emergency oil stockholding systems*, The Hague, CIEP, 2004.

³ OAPEC consists of the Arab members of OPEC, Bahrain, Egypt, Syria and Tunisia.

⁴ Other States that were considered to be strong supporters of the Israeli position and therefore faced a complete embargo by some OAPEC members were South Africa and Rhodesia. See Yergin, D., *The Prize: The Epic Quest for Oil, Money and Power*, USA, Pocket Books, 1991, p. 613.

⁵ Since the US has significant amounts of domestic oil production, it is much less dependent on specific import sources.

Moreover, American foreign policy concerning the Arab-Israeli conflict, according to Mr. Kissinger, could not tolerate independent diplomatic initiatives from the European Community.⁶

To prevent a possible dispute between the industrialised oil consuming countries, the US organised an energy conference in Washington, D.C. from February 11-13, 1974. The most important decision was to establish an energy coordination group to work out an action programme. France would not take part in this decision because of distrust of the intentions of the US. France preferred bilateral agreements with Arab oil producing countries in a European context. Furthermore, France wanted a global conference where both oil consuming and producing countries would be present.

The work done by the energy coordination group resulted in the decision of the Council of the OECD on November 15, 1974 to establish the International Energy Agency and to sign the “Agreement on an International Energy Program (IEP)” on November 18, 1974 in Paris. France maintained the position of not wanting to provoke Arab supply countries by creating a consumer countries’ organisation and was the sole Member State of the European Community not to sign the agreement, along with Finland and Iceland.⁷

The main IEP objective was “to promote secure oil supplies on reasonable and equitable terms” and to “take common effective measures to meet oil supply emergencies by developing an emergency self-sufficiency in oil supplies”. Reducing the dependence upon imported oil was also a main objective. Furthermore, the IEP wanted to set up a comprehensive international information system and create a permanent dialogue with oil companies. Relations with oil producing countries and with other oil consuming countries were to be pursued.

The decision to install the IEA within the framework of the OECD was made for three reasons. Firstly, the OECD was an existing organisation with a legal status, privileges, immunities and expertise, which would ensure that the IEA could be implemented quickly, an important point in light of the severe crisis situation in 1973-74. Secondly, the OECD as an economic organisation of industrialised countries was already concerned with problems related to energy. Finally, it was thought that the oil producing countries would find it less confrontational if the IEA were incorporated into an existing organisation instead of creating a new, independent international organisation of industrialised oil consuming countries.

The European Community’s stockholding provisions were already in place at the time the IEP was agreed upon. Thus, the IEP can be seen as a result of US efforts to limit the influence of Arab countries on European policy-making. Moreover, it matched the interests of some EC Member States to avoid a more far-reaching common energy policy, which would have implied the transfer of considerable decision-making powers from the national to the European level. Participating in the IEA and in the IEP offered the EU Member States an opportunity to escape the consequences of a “unification policy with respect to energy.”⁸ Member States could limit themselves to a European Community policy that focused on the coordination of national energy policies, as well as harmonisation and unification in selected areas.

⁶ Kissinger, H., *Years of Upheaval*, Boston, Little Brown & Company, 1982, p. 900.

⁷ In 1974, 16 countries originally signed the IEP agreement: Austria, Belgium, Canada, Denmark, Germany, Ireland, Italy, Japan, Luxembourg, The Netherlands, Spain, Sweden, Switzerland, Turkey, the UK and the US. At that time, the OECD member countries France, Finland and Iceland did not want to sign the IEP. Norway participates under a special agreement in the IEP. Due to Norway’s own energy resources, the government could not accept the conditions with respect to the oil allocation scheme that was included in the crisis mechanism. Negotiations have led to a special agreement between the IEA and Norway, which essentially means that Norway participates as an ordinary member with the exception of the crisis action program. Subsequently, the following countries acceded to the IEP agreement: Australia (1979), Czech Republic (2001), Finland (1992), France (1992), Greece (1977), Hungary (1997), Korea (2001), New Zealand (1977) and Portugal (1981). Currently, Poland and Slovakia are IEA candidate countries.

The two systems do not compete with each other but are instead complementary.⁹ Legal and procedural problems, which initially appeared to make the two systems incompatible, have been smoothed out by subsequent European Community legislation, adjusting the EC system to the IEA/IEP.¹⁰

The IEP foresees an automatic and clearly defined mechanism for the obligations which participating countries must fulfil in case of an oil supply disruption. This means that in practice, obligations that would arise from the EC system are automatically fulfilled by the activation of the IEP mechanism.

The IEP consists of multiple levels of crisis management. A cornerstone is the ensuring of strategic oil stocks of 90 days of consumption of different oil products. In combination with demand management measures and fuel sharing commitments, the IEP is still a sufficient countermeasure to large-scale supply disruptions, although it should be noted that the programme has not been activated thus far. The crises in the early 1980s and in 1990 at the time of the first Gulf War were dealt with in a different manner, the latter by a smaller programme called Coordinated Emergency Response Measure (CERM). The release of oil stocks in the wake of the hurricane Katrina “was a CERM-type action”.¹¹

The IEA was founded in reaction to the first oil crisis in 1973. The consuming countries, and especially the US, found it important to combine forces into one organisation as a counterweight to the production power of OPEC. However, despite ingenious designs for emergency programmes and the intensive planning surrounding these programmes, the emergency sharing system has never been activated and the smaller CERM has only been invoked twice.¹² Some commentators go as far as to say that the “IEA is essentially an organization for market forecasts and a data compiling organization.”¹³ Since the IEA’s founding and the implementation of the emergency systems, 30 years have passed, and in the mean time the oil market has changed. Integrated spot markets have developed, with prices being more volatile. At the same time, the nature of possible disruptions to the EU’s oil supply has also changed. A new oil crisis caused by a political boycott has not become more likely. Instead, instability in producer countries, terrorist acts causing harm to oil installations and the possibility of major accidents significantly influencing oil supplies, for example at the Bosphorus, pose greater threats.¹⁴ The current emergency systems, the IEP in particular, were not designed to counteract such threats, which later on were even explicitly excluded as reasons for activation of IEP measures.

⁸ The energy policy of the EU is largely based on Article 235, written as a temporary measure in case the Member States found some new area needing to be developed which had been left out of the original 1957 Treaty. In his book, *EU Energy Policies towards the 21st Century*, Paul Lyons states that dependence on Article 235 for an overall European energy policy is “both embarrassing and harmful for the European Community.” It was meant to be used once for a particular purpose until the next Treaty revision, but “that was more than 40 years ago.” Since then, there has been ample opportunity to insert a proper text, but some Member States have willfully refused to do so. An energy policy dependent upon Article 235 is even more absurd if one bears in mind that the same Member States have agreed to qualified majority voting among themselves for internal market and environment issues. They have also given the European Parliament co-decision powers in the same areas, and they have decided on a political and a monetary union. In particular, the UK and The Netherlands both have sizeable gas reserves, and France has its unique dependence on nuclear energy. With unanimity being the rule, those countries can always be sure to block any measure that might jeopardize national policy. Conversely, Belgium and Italy both have argued intensely for an energy chapter in one of the Treaties. In accordance with the principle of subsidiarity established in the Treaty establishing the European Community, energy policy must be largely regarded as the Member States’ own responsibility. Lyons, P.K., *EU Energy Policies towards the 21st Century*, Brussels, EC Inform, 1998.

⁹ A more in-depth analysis of this issue can be found in: Lefeber, R., “Het IEA -het IEP en het energierecht van de EG, MA-Thesis Nederlands Recht Internationaal, Leiden University, Unpublished, 1986.

¹⁰ See in particular Lefeber, R. and Linde, J.G., van der, “Europese integratie vergt een energie(k) beleid”, In: *Sociaal-Economische Wetgeving*, June 1987, pp. 14-16.

¹¹ Citation comes from e-mail correspondence between CIEP and IEA staff.

¹² And in both instances apparently not officially.

¹³ Noreng, O., *Crude Power, Politics and the Oil Market*, London, I.B. Tauris Publishers, 2002, p. 48.

¹⁴ Producer countries face a variety of stability threatening circumstances, ranging from strikes to civil wars.

As explained above, the origins of the IEA are in part political. The IEA was formed under the OECD to ensure an important role for the US and to prevent European countries from pursuing their own plans, such as a producer-consumer dialogue. For a long time, the IEA itself was unable to initiate a fertile dialogue. Robert Priddle recounted an anecdote from the period when he had just begun to serve as Executive Director of the IEA.¹⁵ He asked his staff to arrange a meeting with the Secretary General of OPEC – and encountered surprised reactions. Obviously, such a meeting was at the time a highly innovative move, and had never taken place before. The IEA and OPEC were not simply parties within a market. They were political opponents. It is only in recent years that this relationship has become more relaxed.

Although measures have been put in place to depoliticise the actual decision to activate the emergency systems, in the end, decisions remain political in nature. The IEA consists of 26 participating countries spread over three continents. The countries have indeed very different positions with respect to geographic location, political circumstances and dependence upon certain suppliers such as OPEC. Whereas the emergency response system as laid out in the IEP is a fairly automatic system that is very difficult to block by even a group of Member States, the CERM system requires unanimity voting.¹⁶ The flexibility inherent to the system, requiring decisions on the general response at the time of crisis, is in this respect the system's greatest strength as well as its greatest weakness.

Furthermore, the IEP is not only built on solidarity, it also requires solidarity at the very time of actual operation. Countries that are relatively less affected by a supply disruption must come to the assistance of those that are more severely affected. The test of this solidarity in the event of a real supply disruption is yet to come. Although unanimity is not necessary within the Governing Board to invoke measures according to the IEP, it would certainly undermine the IEA were unanimity not to be reached in crisis situations.

Up and coming countries such as China and India are not part of the IEA and do not have a well elaborated emergency response system. This makes China and India more vulnerable to supply disruptions and to pressure from producer countries. The lack of such systems could potentially undermine the position of the EU and the US in negotiations with producer countries about reforms or, in a current example, the development of nuclear weapons. Producer countries can find support with China, which has no short-term possibilities to defend itself against supply disruptions. The interests of China and India are considerable, and these countries have no safety net. Promoting, assisting and perhaps even collaborating between IEA and China and India seem necessary. At the same time, the criticism that there are 26 countries spread over three continents with different energy mixes and dependencies, and the question of whether these countries will eventually demonstrate solidarity as agreed upon, would become a greater problem. Attempts of the European Commission to increase the amount of stocks inside EU Member States to 120 days makes sense in that it would give the EU stocks they can decide upon themselves and use as they see fit. The stocks can be used in the case of a small disruption or large price fluctuations, although the effectiveness of the latter is doubtful since the oil market is a world market in which the EU holds only a 16% market share. Using the stocks to combat price fluctuations would also undermine the position of the IEA.

6.3. EU supplier countries

The European Union is dependent upon importing energy. The majority of those imports is drawn from eight countries. These countries are Norway, Russia, Algeria, Saudi Arabia, Libya, Iran, Kazakhstan and Nigeria. All of these countries export oil to the EU, but the first three are particularly important as they also export gas. Any incident that disrupts supply from these countries has a severe impact on the European Union. Therefore, it is important to have insight into the political and economic situations of these countries to be able to properly assess the likelihood of risks. For each of the aforementioned countries

¹⁵ Robert Priddle was Executive Director of the IEA until the end of 2002. He told the anecdote during his Clingendael Energy Lecture in November 2002.

¹⁶ See: Willenborg, R., Tönjes C., and Perlot, W., *Europe's oil defences; An analysis of Europe's oil supply vulnerability and its emergency oil stockholding systems*, The Hague, CIEP, 2004, pp. 61-66.

we will briefly discuss the risks of internal conflicts and concerns about the security of supply. The chance of regional conflicts disrupting supply is considered low, with the possible exception of the tension caused by the nuclear activities of Iran.

Norway

The EU enjoys a very good relationship with Norway. The risks of major supply disruptions are deemed low, although short-term disruptions as a result of strikes can always occur and cannot be foreseen. Economic growth is solid and the political situation is stable. Oil and gas reserves in Norway are fairly mature, however. No major new oil discoveries have been made in Norway, and the reserves-to-production ratio has sunk to only nine years. This means that the share of Norwegian oil in the EU oil imports will inevitably fall.

Russia

Russia is the largest exporter of oil to the EU and also the largest supplier of natural gas. Although many see Russia as an unstable country, major supply disruptions have never occurred. Even in the early years of the transition to a market economy, as the country went through a major economic crisis, it fulfilled its obligations. The risks regarding Russia pertain rather to the ability of Russia to uphold its production capacity. Russian reserves are abundant. However, the investment climate is suboptimal. Government regulation is excessive, legal uncertainties persist and government efforts aimed at increasing control over the energy sector are seen by some as an attempt to renationalise large parts of the energy sector. Foreigners are not allowed to own majority stakes in oil and gas projects. The risks for foreign investors have increased. At the same time, high oil prices ensure healthy government revenue and the Russians are increasingly able to self-finance their investment needs. It remains to be seen if Russia can increase production and exports, as transportation bottlenecks persist. Huge investments are needed to build new oil and gas pipelines and to develop new fields.¹⁷

Algeria

Algeria is a large oil and gas exporter to the European Union, especially to the southern member states. Algeria went through a civil war in the 1990s, but the political situation is now relatively stable. The government has managed to reconcile the ethnic and religious groups, and also has undertaken efforts to reform the economy. This has resulted in economic growth, which was partly made possible by higher production of oil and gas. Algerian mineral reserves are abundant. The reserves-to-production ratios for oil and gas are 18 years and 55 years respectively. The major risks are that the country is overly dependent upon energy income and that there is a possibility of renewed ethnic/religious violence. The country must diversify its economy in order to decrease the vulnerability to price shocks and to create jobs. At the same time, it will need to continue efforts to balance the interests and representation of the ethnic and religious groups in the country.

Libya

Libya will become more important for the EU now that president Khadaffi has made the necessary steps to better integrate the country into the international system. Libya has considerable oil and gas reserves, and the country is opening up for foreign direct investments. Although Khadaffi might be showing his best face to the world at the moment, the situation in Libya itself has not changed and democratic reforms are not very likely in the foreseeable future.

Saudi Arabia

Saudi Arabia is the world's largest producer and exporter of oil. It is the third largest exporter of oil to the European Union. Reducing dependence upon oil from Middle Eastern countries is still seen as a priority, as the fear of a politically inspired supply disruption from Saudi Arabia (or another country from that region) is still very much alive. However, since the oil crisis of 1973 no new supply disruptions have occur-

¹⁷ Janssen, E., *Can Russian oil growth be sustained*, The Hague, CIEP Briefing Paper number 4, 2005.

red. Saudi oil reserves are unmatched in the world and are currently at 263 billion barrels. The ratio of reserves to production is 71 years. Recently, Saudi Arabia expressed concerns about OPEC's ability to meet future demand; they doubted the ability of Saudi production to grow above 15 mb/d, which means that production capacity would remain below projected future demand.¹⁸

There are concerns regarding the political stability of Saudi Arabia. Saudi Arabia is almost completely dependent upon oil revenue. It uses oil revenue to build an ever-expanding system of social benefits. Oil revenue is also used to create jobs, as the oil industry itself is very labour-intensive. The Saudi Arabian economy is therefore very vulnerable to price shocks. A low oil price almost certainly will have a disastrous effect on the economy and could result in social unrest. The likelihood of a low oil price is low in the short term however, as oil markets will continue to be tight. Many Western governments also expressed concern about the non-transparency of Saudi oil reserves reporting. They doubt the Saudi reserves and have urged them to provide evidence on the correctness of the reported data, because it would have a calming effect on world oil markets.

A third risk is that the country has been home to a large number of terrorists. Western countries fear that terrorism is gaining influence in Saudi Arabia and might destabilise the country, or that terrorists might attack vital oil infrastructure, such as oil terminals. This would almost certainly result in supply disruptions. The social, cultural and religious situation in Saudi Arabia is difficult to assess for outsiders, but major social unrest seems likely within the next ten years. A change in orientation of the Saudi Arabian government away from the West and the US is also possible.

Iran

Iran is a large exporter of oil to the EU and for a long time seemingly wanted to become a large gas exporter as well. However, over the last few years Iran has been a net importer of gas, and recent policy developments show a shift towards a higher emphasis on the domestic use of gas for power generation and on keeping oil fields under pressure. The recent election of a conservative hardliner is fuelling Western concerns about the path that Iran will choose in the coming years. Reactivation of its nuclear programme confirms this concern, especially since the recalling of senior diplomats that were involved in the negotiations over Iran's nuclear programme under former president Mohammed Khatami.¹⁹ Sanctions have been imposed on the country by the US. Iran is therefore isolated internationally, and as a result is experiencing economic hardship. The country is very dependent upon oil revenue - as are most countries in the region - and is having trouble upholding its production capacity. The state has had trouble investing in oil exploration, infrastructure and social programmes simultaneously. As a result, the outlook on Iranian production capacity is uncertain, although the country has huge reserves. The country's gas reserves are also abundant, but the huge investment to unlock the reserves has to come from domestic Iranian sources, given the sanctions on investment. The notable exceptions are China and India who are both investing in the oil and gas sectors, in multibillion dollar deals stretching over decades. It is uncertain how the development of the gas industry will progress. Export routes for gas are also a problem, as many countries refuse to enter into trade with Iran, and Iran depends upon transit through third-party countries to reach European markets.

Nigeria

Nigeria is an important oil exporter and future LNG supplier. However, Nigeria has one of the highest costs per unit for exporting LNG to the EU. With an indicated cost of USD3 per Mbtu, it is almost twice as costly as gas from Europe's major suppliers.²⁰ Furthermore, the outlook for Nigeria is very uncertain as the country is labelled as 'high risk'. The country's record on human rights and democracy is poor, and

¹⁸ "OPEC can't meet West's oil demand", say Saudis", *Financial Times*, Thursday 7 July 2005.

¹⁹ "Iran recalls senior ambassadors", BBC News, 2 November 2005, http://news.bbc.co.uk/1/hi/world/middle_east/4398442.stm.

²⁰ Tönjes, C., *Gas To Power*, The Hague, CIEP, 2005, p. 21.

the political situation is unstable. Ethnic and social unrest resurface repeatedly, and the government organisations remain among the most corrupt in the world. All these circumstances make it a very difficult operating environment for oil companies. Although reserves in Nigeria are large, the development of these reserves depends almost entirely on the ability of Nigeria to attract investors. Nigeria is among the poorest countries in the world, and it is almost completely dependent upon oil revenue.

Kazakhstan

Kazakhstan has emerged only recently as a major exporter to the European Union. It has large oil and gas reserves, and production of both is expected to increase. The marketing of these resources will also become more favourable now that the country is no longer entirely dependent on Russia for its exports. The BTC-pipeline circumvents Russia. But a number of problematical issues remain. Kazakhstan also could fall into the trap of becoming a petrostate, as the country is rapidly becoming completely dependent upon energy revenue. Unemployment in the country is high and the GDP per capita low. Furthermore, the centralised power in the hands of the president, the legal uncertainties and corruption make Kazakhstan a high-risk environment for investors.

6.4. Europe's oil and LNG transport 'choke points'

Trade in oil and LNG is expected to increase strongly. However, the transport infrastructure poses serious constraints to achieving growth in volumes. This is especially true for major sea trade routes. Some of the most-used oil trade sea routes are very busy and are developing into bottlenecks. Over 35 million barrels per day pass through relatively narrow shipping lanes and pipelines.²¹ Shipping accidents can cause serious impediments to transportation on these routes, and neighbouring countries or hostile forces can relatively easily disturb transportation – thus, these shipping routes and pipelines are referred to as 'choke points'. Disruption of oil flows through any of these export routes could have a significant impact on world oil supply and therefore also a significant impact on the world and regional market price for oil. When a trade route is blocked, oil already on the way to its destination has to be rerouted, leading to potentially major delays and causing shortages in the regions mainly supplied through the specific trade route. For crude oil (and products) supply to Europe, the Bosphorus/Turkish Strait and the Suez Canal/Sumed pipeline choke points are geographically important.

To illustrate Europe's vulnerability to these choke points, let us remember the sunken car carrier, *Tricolor*, in the North Sea channel between the UK and the European continent. Even in such a relatively broad channel compared to the Bosphorus/Turkish Straits, two accidents have occurred while naval warnings were effective.²² A sinking such as the *Tricolor* in the Bosphorus would almost certainly lead to its closure, making crude oil exports by tanker from countries surrounding the Black Sea and, more importantly, the Caspian Sea, virtually impossible. Figure 1.2 presents the world's most important choke points. The points that are of major importance for Europe's supply are described below.

²¹ EIA, *World Transit Oil Choke points*, USA, April 2004, <http://www.eia.doe.gov>.

²² On December 16, 2002, the *Nicola*, a 3,000 metric ton ship registered in the Dutch Antilles, hit the wreck of the *Tricolor*. The Turkish ship *Vicky*, carrying 70,000 metric tons of highly flammable gas oil also struck the sunken *Tricolor* in the night of January 1-2, 2003, after failing to heed French naval warnings.

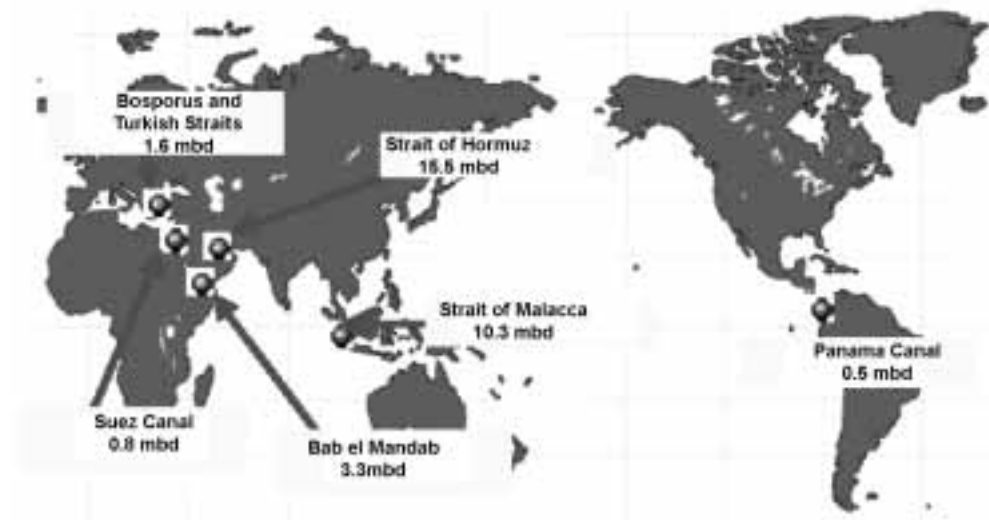


Figure 6.2 World transit choke points

Source: APERC

Bosporus / Turkish Straits

Bosporus Strait, connecting the Black Sea with the Mediterranean Sea, forms one of Europe's main supply vulnerabilities with respect to crude oil, particularly for southern Europe. The 27 kilometres strait is more like a river than open sea, with less than 700 metres width in some places and numerous blind turns. With more than 50,000 vessels passing annually, amongst which are 5,500 oil tankers, the possibility of shipping accidents in the Bosporus poses a severe threat to the environment as well as to Europe's security of oil supply. Increasing congestion has led to a rising number of major accidents.

In October 2002, Turkey placed new restrictions on oil tanker transit through the Bosporus, including:

- a ban on night time transit for ships longer than 200 metres;
- the requirement that ships carrying dangerous cargo (including oil) request permission to transit 48 hours in advance; and
- a one-way traffic regulation for ships more than 250-300 meters long and for any ship carrying liquefied natural gas (LNG) or liquefied petroleum gas (LPG).

The regulations are said to have slowed tanker transit by about three and a half days.²³

Exports through the Black Sea and the Bosporus have increased since the early 1990s. New Caspian Sea region development of oil fields is likely to increase demand for shipping via that waterway. Until this year's completion of the Baku-Tbilisi-Ceyhan (BTC) oil pipeline, the Bosporus Strait offers the only point between the Black Sea and the Mediterranean Sea for the transit of Caspian oil. In 2005, the EIA estimates that exports through the Turkish Straits amount to 3.0 million barrels per day, well exceeding the handling capacity of that waterway, estimated at around 1.8 million barrels per day.²⁴

Suez Canal and Sumed pipeline²⁵

Suez Canal connects the Red Sea and Gulf of Suez with the Mediterranean Sea. Accommodating ships with drafts of up to 58 feet means that Suezmax carriers (which are built this particular size accordingly) can pass through the canal but that very large crude carriers (VLCC's) and ultra large crude carriers (ULCC's) cannot.²⁶

²³ EIA, *World Transit Oil Choke points*, USA, April 2004, <http://www.eia.doe.gov>.

²⁴ Ibid.

²⁵ Ibid.

The Sumed pipeline, built as a bypass to the Suez Canal, makes it no longer necessary for large crude carriers to sail around the tip of Africa en route to Europe or the US. The Sumed pipeline consists of two parallel 42-inch pipelines. VLCCs and ULCCs can discharge their crude oil at the Ain Sukhna terminal on the Gulf of Suez and then pass through the Canal and reload to the maximum again in Sidi Kerir on the Mediterranean. The Sumed pipeline has a capacity of around 2.5 million bbl/d. In 2001 the Suez Canal transported around 1.3 million bbl/d of petroleum. These two choke points added together make for a combined oil flow through Egypt of 3.8 million bbl/d.

Nearly all of the crude oil transported through the Sumed pipeline comes from Saudi Arabia. In 2001, Saudi Arabia supplied the EU with nearly 59 million metric tons of crude oil, representing the fourth largest crude oil import origin for the EU. Closure of the Suez Canal and/or Sumed Pipeline would result in oil tankers having to divert around Africa's southern tip, the Cape of Good Hope, adding greatly to transit time and effectively reducing tanker capacity. Therefore, closure of the canal or the pipeline poses a serious threat to the EU with respect to security of supply as well as to oil prices, because transporting crude oil in VLCCs or ULCCs around Africa means a severe demand increase in tanker capacity, which – in the short run at least – consequently leads to higher transport prices and thus higher petroleum prices in the EU.

Russian Oil and Gas Export Pipelines/Ports

Russian oil and gas exports transit via pipelines that pass through Russia, Ukraine, Belarus, Hungary, Slovakia, Czech Republic and Poland. This is a vulnerable transport route, because some of the states through which Russian exports transit have a history of tapping deliveries and of interference. Also, Ukraine and Belarus have debts to Russia; they are unable to pay for the deliveries of oil and gas from Russia, and this puts tension on the relationship between Russia and Ukraine and Belarus.

Russia is a major supplier of crude oil and natural gas to Europe. All of the ports and pipelines are operating at or near capacity, leaving limited alternatives if problems should arise at Russian export terminals. With a windfall in oil export tariffs over the past several years, Transneft, the state oil transport monopoly, has taken steps to upgrade the country's pipeline system, especially the Baltic Pipeline System and the Primorsk oil terminal. Russian energy policy emphasises building new 'transit-free' export pipelines to increase reliability of deliveries and bring down costs for oil exporters.

Nearly 90% of Russia's natural gas exports to Europe are routed through Ukraine. In an effort to diversify its export routes, as well as reach new markets, Russia is expanding existing and building new pipelines. The most prominent is the Northern European gas Pipeline (sometimes referred to as the Baltic Pipeline), a direct undersea pipeline from Russia to Germany, with a possible extension to The Netherlands and the UK

Caspian oil and gas

Oil and gas from the Caspian region have traditionally been shipped through the Russian transportation system due to the lack of alternative shipping routes. Because Caspian exports effectively compete with Russian exports, Russia is reluctant to allocate Caspian countries a share of its transport capacity for tran-

²⁶ Oil tankers come in two basic categories: the crude carrier, which carries crude oil, and the clean products tanker, which carries refined products, such as petrol, gasoline, aviation fuel, kerosene and paraffin. With respect to size, the following categories are generally distinguished:

HANDY SIZE TANKER = 20,000 – 30,000 Dead Weight Tonnage (DWT)

HANDYMAX TANKER = approx 35,000 DWT

PANAMAX TANKER = between 60,000 – 80,000 DWT

AFRAMAX TANKER = between 75,000 – 125,000 DWT

SUEZMAX TANKER = between 125,000 – 180,000 DWT

VLCC TANKER = between 200,000 – 300,000 DWT

ULCC TANKER = 500,000 DWT.

sit through Russia toward the European market. Because Russia is struggling with capacity shortages of its own, it claims it does not have the capacity to handle additional (third party) oil and gas shipments. Moreover it fears the competition of Caspian energy resources and is giving priority to projects aimed at increasing the export capability for Russian resources. Russia was traditionally able to 'regulate' the export of energy resources from former Soviet Union republics because all export routes ran through Russia. This situation is gradually changing.

Caspian countries, especially Kazakhstan and Azerbaijan, have built alternative routes that circumvent Russia. This will boost not only their capacity, but also their autonomy. In so doing, they have been able to emancipate themselves and become more independent from Russia. The recent completion of the Baku-Tbilisi-Ceyhan oil pipeline is an example of this. This route was built to export Caspian crude oil to the European market and was backed by many western countries as a key project, reducing the European dependence on Russia. First shipments are planned to start in the fourth quarter of 2005.

A second project, but still in the planning stage, is a gas pipeline from the Caspian region (Iran) to Austria via Turkey, Bulgaria, Romania and Hungary. This project is known as the Nabucco pipeline. The project's main attraction is that it would connect greenfields in the Caspian with the European market, which would greatly expand the possibilities of the European market to diversify the origins of its imports. Therefore, the project is heavily backed by the European Union. Feasibility studies are currently being conducted, with European funding. The success of the project will depend upon the ability of the Caspian countries to develop their gas reserves. Moreover, there are political issues to be solved first. Trade with Iran is politically controversial; the US has imposed economic sanctions on the country. The US has stated that the fundamentalist-Islamic anti-Western regime in Iran poses an unusual and extraordinary threat to the national security of the country. The development of a nuclear complex in Iran puts further pressure on its relations with the US. The EU has traditionally backed the US sanctions, complicating European relations with Iran. Relations with other Caspian countries are also complicated due to the nature of the regimes in place there. Caspian republics have made slow progress in implementing democratic reforms and making free elections possible. Their regimes are autocratic, repressive and sometimes corrupt.

The project would greatly profit if Turkey were to become a member of the European Union. Then the gas would flow directly from the producing country into the single European market space without transiting third countries. Negotiations with Turkey are underway, but the European Union to date has not taken an official stand on whether Turkey can become a member state of the European Union. If Turkey were to be left outside the EU, cooperation between the EU and Turkey on energy issues would be more complicated, although Turkey has ratified the Energy Charter treaty.

The Energy Charter treaty's provisions focus on five broad areas: the protection and promotion of foreign energy investments, based upon the extension of national treatment or most-favoured nation treatment (whichever is more favourable); free trade in energy materials, products and energy-related equipment, based upon WTO rules; freedom of energy transit through pipelines and grids; reducing the negative environmental impact of the energy cycle through improving energy efficiency; and mechanisms for the resolution of State-to-State or Investor-to-State disputes.²⁷

6.5. Energy market liberalisation processes

Currently in the European Union and some other regions of the world, gas and electricity markets are being or have been liberalised, leading to the introduction of customer choice and the removal of traditional regional or national monopolies for the provision of gas and electricity. In the following, a brief introduction is given to the liberalisation of energy, illustrated by the example of European gas markets. The liberalisation process, although in principle concentrating on the organisation of domestic energy markets, also changes the market environment in which external gas suppliers have to market their resources.

²⁷ Energy Charter Secretariat (ECS). <http://www.encharter.org>.

6.5.1 Traditional gas markets arrangements in continental Europe

The development of the natural gas market in Western Europe was boosted in the 1960s by the discovery of the giant Groningen field in The Netherlands. The availability of ample, low-cost supplies triggered the enforcement and development of gas transmission and distribution infrastructure in northwestern continental Europe. The convenient properties and the competitive pricing of natural gas (see below) resulted in strong demand growth, which supported domestic production in other EU countries such as Italy, Denmark and Germany and, later on, imports from Norway, Russia and Algeria.²⁸ National or regional monopoly transmission companies have taken care of the transportation of domestic production and imports to the local distribution companies and large customers. Natural gas supply contracts have been of a long-term nature, usually running for 20 years or more, and include take-or-pay provisions as well as destination clauses.²⁹ Contractual gas prices have been indexed against substitute fuel prices such as fuel oil, and the price for producers has been derived from the price for final customers; less cost incurred for transportation, distribution, storage and other services (so-called ‘net-back pricing’).³⁰

The reasons for this specific contract structure can be found in the relatively high risks associated with the development of natural gas projects. Investment needs, especially in the transportation part of the industry, are much higher than for other fossil fuels such as oil or coal. Moreover, the rather long planning horizon increases the uncertainties about the market developments up until the moment the gas actually reaches the market. If pipelines are involved, most of the investment is sunk, due to the dedicated nature of the pipeline, which connects a specific upstream project with a specific market.³¹ Depending on who bears the financial cost involved in the project, the purchaser of gas from a specific project has an incentive to switch to alternative suppliers once these offer more favourable terms. The producer, on the other hand, has an incentive to charge higher gas prices once the pipeline has been constructed. Long term take-or-pay contracts in this respect diminish the risk that any of the parties involved will behave opportunistically. The contract terms place the price risk on the producer since fluctuations in the price of substitute fuels are passed on to him; the purchaser takes the risk of marketing the contracted take-or-pay volume of gas, which might turn out to be too high for his customers (volume risk).

Under the traditional market structure in continental Europe, which had regional monopolies, purchasers could rather easily commit to take-or-pay provisions. After all, customers had no choice of supplier, and once they were committed to taking gas from a certain company they would do so unless the incentive to switch to an alternative fuel became very strong. The latter effectively was prevented by the indexation of the gas price against the substitute fuel price, making sure that gas was always competitively priced.³²

²⁸ Dutch energy policy also restricted total production from The Netherlands, so that there was more room in the market for suppliers other than The Netherlands. Tönjes, C., “Die niederländische Gaswirtschaft im Umbruch”, *Energiewirtschaftliche Tagesfragen*, Vol. 53, 6, 2003, pp. 358 - 362.

²⁹ ‘Take or pay’ (TOP) means that the purchaser of gas has to pay for a certain part of the contracted quantity, regardless whether he actually takes the gas or not. TOP quantities regularly exceed 80 % of the annual contracted quantity. Destination clauses prevent the purchaser from reselling gas in other areas and sometimes even for other uses than specified in the gas contract. This effectively eliminates the possibility for purchasers to resell excessive gas quantities in markets in which the gas producer might be active itself.

³⁰ Hensing, I., Pfaffenberger, W. and Ströbele, W., *Energiewirtschaft*, München/Wien, Oldenbourg Verlag, 1998, p. 82.

³¹ But LNG projects are also currently still characterised by limited flexibility of the supply chain. Most existing receiving terminals are committed to specific supply sources, so that new liquefaction projects find little outlet in existing markets, unless they secure their own receiving capacity. This situation, however, is gradually changing with an increasing number of regasification terminals being built without firm supply commitments. CIEP, *The role of liquefied natural gas (LNG) in the European gas market*, The Hague, 2003, <http://www.clingendael.nl/ciep>.

³² Consumer prices for gas have been indexed against, e.g., light fuel oil. The formulas used to calculate the gas price include provisions for the advantages that natural gas offers as compared to alternative fuels, such as higher conversion efficiencies or the absence of need for storage. Formulas use time-lagged, averaged prices of alternative fuels, leading to prices being more stable than those the gas price is indexed to.

Variations in demand were accounted for by flexible take-or-pay provisions. Destination clauses also assured reasonable returns on upstream investment.

6.5.2 Liberalisation of the EU gas market: a new era, new risks and new contract forms

Although the price formulas handled in the prevailing gas supply contracts ensure customers of competitive pricing - at least relative to oil supplies - the sheer existence of national or regional gas supply monopolies gives leeway to those companies to exercise monopoly power and concurrently reduces their incentives to act as efficiently as possible. From the perspective of a consumer, it would be desirable if gas prices would have the prices of substitute fuels as an upper long-term price limit, with prices being lower than those of substitute fuels if the supply/demand balance allows for it. Moreover, the inability of customers to choose between alternative suppliers reduces the possibility of free international trade. The liberalisation of gas markets aims to increase competition between gas suppliers and in this way to reduce monopoly interest earnings assumed to be currently reaped by gas supply companies to the detriment of consumers.

Box 6.1 – Gas networks: Natural monopolies?

Activities considered to be natural monopolies are characterised by long – lasting assets and significant economies of scale, which makes the establishment of several competing companies uneconomic. In the case of a natural monopoly, a single system or company can provide the product in question at a lower cost than any other number of systems or companies.

In the gas industry, distribution is considered a natural monopoly since reduplication of a gas distribution network would be highly inefficient. The argument for transmission, i.e. the long-distance, high pressure pipeline transport of gas from the producers to the distribution systems, is much less straightforward; examples from the United States, Germany and The Netherlands show that it is possible to have multiple, competing gas transmission systems within one market.^a However, in most regulatory environments little distinction is made with respect to specific regulation of transmission and distribution systems. The EU directive 2003/55/EC also takes very similar approaches to distribution as well as to transmission.

The question of whether to consider an activity a natural monopoly or not has significant relevance to the regulation of the market. Believing gas transmission to be a competitive activity would, for example, reduce the need for regulatory intervention, such as the establishment of a regulated regime for third-party access, for transmission pipelines.

a. IEA, Regulatory Reform: European Gas, Paris, OECD/IEA, 2000, p. 70

Liberalisation of gas markets regularly involves two main elements: allowing customers to freely choose their gas supplier, and opening the existing networks for use by parties other than the incumbent monopoly gas supplier. Gaining network access, preferably on the same terms as the incumbent gas company (generally the network owner), removes the need for new gas supply companies to build a gas network on their own (see also box 6.1). The incumbent gas company has a strong incentive to discriminate against other parties seeking to use its gas network, since it might lose gas sales to new competitors. Thus, ensuring equal access to monopoly networks is the key to the successful liberalisation of gas markets.

In pursuit of the realisation of the European Internal Market, the Commission of the European Communities assessed as early as 1988 the obstacles to the realisation of an internal energy market in a commission working document and made proposals on how to address them.³³ A cumbersome political process then initiated led to the first gas directive 98/30/EC and five years later to the currently relevant second

³³ Cameron, P., Competition in energy markets. Law and regulation in the European Union, Oxford, Oxford University Press, 2002, p. 30.

gas directive 2003/55/EC.³⁴ These directives set the framework for the liberalisation process of EU gas markets. The main points of directive 2003/55/EC are summarised in the following section.

The European gas directive 2003/55/EC “Acceleration directive”

Eligible customers

The directive provides that starting July 1, 2004 all non-household consumers and starting July 1, 2007 all customers be free to choose their gas supplier. This means a considerable advancement of the timetable provided in the first gas directive, which is why directive 2003/55/EC has also been labelled as the “acceleration directive”.

Access provisions and regulatory authorities

The options for regulating access provisions have been limited as compared to the first gas directive. Whereas the latter granted Member States the opportunity to choose between negotiated and regulated third-party access for the transmission and distribution system and LNG facilities, now regulated third-party access has been made compulsory.³⁵ A regulatory authority must set or approve the terms and tariffs for third-party access, or at least the methods to establish them. Also, balancing services are subject to regulated terms and tariffs. With regard to access to storage facilities and linepack, Member States can still choose between negotiated and regulated access.

Unbundling

In addition to the requirement for gas companies to keep separate accounts for distribution, transmission, LNG activities and storage activities, the transmission and distribution system operators must be legally independent from other parts of an integrated gas undertaking.³⁶ However, Member States can postpone the unbundling requirement for distribution activities until July 1, 2007. Special provisions with regard to the influence of affiliated, i.e. parent companies upon the operations of the system operators (so-called Chinese walls) are designed to further reduce the incentives for system operators to discriminate between system users as well as to limit the opportunities for the parent company to strategically influence the long-term behaviour of the system operators, such as investing in system extensions. These ‘Chinese walls’ must also be established around distribution activities within a gas undertaking as long as they are not legally independent. The ownership of assets, such as transmission and distribution networks, does not need to be transferred to the system operators and can remain, for example, with the formerly fully integrated gas supply company.

Liberalisation and long-term contracts

The European gas directive by no means rules out the conclusion of long-term supply contracts. However, the terms for network access are subject to the regulatory framework developed by national authorities. Long-term network capacity contracts, back-to-back with long-term supply contracts, might become more

³⁴ European Communities (EC), “Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas”, *Official Journal* L 204, 21 June 1998, pp. 1-12 and EU, “Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC”, *Official Journal* L176, 15 July 2003, pp. 57-78.

³⁵ Under a negotiated access regime, the pipeline (or LNG facility, storage etc.) operator is, in principle, free to negotiate the access terms with parties seeking access. Ensuring that the operator is applying non-discriminatory terms is rather difficult – but not impossible – in such a system. In a regulated TPA system, as required by the second gas directive for the gas networks, access tariffs and terms are set or approved by a regulatory authority. For a more detailed discussion of the advantages and disadvantages connected to these two approaches to third-party access see e.g. IEA, *Regulatory Reform: European Gas*, Paris, OECD/IEA, 2000, pp. 75-79.

³⁶ It is possible to combine transmission and distribution system operation, LNG activities and storage in one legal entity. The basic approach is to separate the activities that are approached as needing regulation from the potentially competitive ones.

difficult to conclude in the future, depending upon the regulatory approach taken by the various Member States.

6.5.3 Main risks for gas suppliers stemming from the liberalisation of markets

Risk for supply companies

The introduction of consumer choice increases the uncertainty for incumbent gas companies as to whether they can sell all the gas they contracted for. Gas companies have always had to deal with uncertainties surrounding demand development. These uncertainties have been rather small, however, given the competitive ‘market value’ pricing of gas, which effectively eliminates fuel switching. Now these uncertainties are augmented by the threat that customers will choose alternative gas suppliers if those suppliers are able to offer more competitive terms. British Gas, for example, faced substantial take-or-pay obligations for natural gas they could not sell, also due to the fact that alternative suppliers with access to their own gas entered the market from 1995 onwards.³⁷

Gas importing companies react to this changing risk structure by deviating from the traditional supply arrangements when acquiring new supplies from producers:³⁸

- Newly concluded long-term purchase contracts have a duration of 8-15 years rather than the 15-25 years that were standard in the past;
- The annual volumes contracted for in any single contract tend to become smaller, now rarely exceeding 10 bcm;
- The volume flexibility of those contracts increases: this can be done by imposing lower take-or-pay obligations and/or by including provisions such as a purchaser’s call option on additional quantities;
- And finally, new long-term supply contracts are regularly linked to spot market prices, where liquid spot markets exist.

Whereas the first three points reduce the risk involved by simply reducing quantities and commitments involved, the coupling of long-term supply contracts to spot market prices almost eliminates the marketing risk for the gas supplier and exposes the producer with a higher price risk. The liberalised UK gas market is making increasing use of such contracts. They also feature in a new major Gasunie supply contract for Centrica in the UK.³⁹ It remains to be seen whether producers that need to finance significantly larger investments in order to bring their gas to European markets will be willing to assume an increased price risk.

Risk for producers and producing countries

As a result of the considerations for supply companies and the reactions of companies to these risks, producers are being exposed to stricter contract terms, increasing uncertainty for their supply projects. In liberalised gas markets, gas prices generally still follow the prices for alternative oil products. However, in times of very strong oversupply of natural gas, gas might actually be priced lower than the competitive oil product price, while the upper price for gas in times of gas scarcity is still set by competing fuels. Moving from oil-indexed prices to spot gas prices thus removes, to some extent, the price floor, while the price still remains capped at the upper end.

³⁷ Thomas, S., “Gas as a commodity. The UK gas market: from the nationalism to the embrace of the free market”, pp. 193-194, In: Arentsen, M.J. and Künneke, R.W. (eds.), *National reforms in European gas*. Amsterdam, Elsevier, 2003, pp. 181-211.

³⁸ Stern, J., “UK gas security: time to get serious”, In: *Energy Policy*, 32, 2004, pp. 1967-1979; IEA, *Security of gas supply in open markets*, Paris, OECD/IEA, 2004; and Tanishima, S., *Future view of gas power generation of Tepco*, presentation at the joint workshop of IEA and IGU “The future of gas for power generation”, 14 June 2004, Paris

³⁹ Around 70% of British gas supplies are traded under long-term supply arrangements. Stern, J., “UK gas security: time to get serious”, pp. 1972, In: *Energy Policy*, 32, 2004, pp. 1967-1979. Oil-price linkage still exists but is continuing to lose importance. Centrica, for instance, replaces every expiring contract linked to oil prices by one linked to NBP prices.

Risk for system operators

The transportation part of the industry, often in liberalised markets a de facto monopoly, faces a different type of risk. The risk of no longer being able to sell all transportation capacity of the system to users does not change very much whether the system operates in a monopoly or a liberalised market environment. The gas still must reach the customer, regardless of which supplier the customer chooses. However, regulatory authorities, motivated by governments and the European Commission to increase efficiency also in the monopolistic parts of the gas industry, might press for lower transportation tariffs and the provision of extra services. This can in turn decrease the profitability of the transportation company. Under the EU directive, network operators are obliged to operate the networks safely and reliably as well as to develop them. With regulated lower returns, it could be more difficult to gain access to financing.

Another complicating factor, especially for the transmission system operator, is that with a larger number of gas suppliers, the long-term planning for the network layout becomes more difficult, as the system operator probably obtains less information from gas suppliers as to where long-term supplies will come from.

How large these impediments are for the gas transportation sector within the European Union is difficult to assess. If regulators allow for sufficient returns on investments, gaining access to finances should not be a major obstacle. After all, revenues are guaranteed to a large extent, due to the monopoly position of the network operators in most EU regions. Moreover, a greater number of supply companies will have to provide information to system operators as to the expected sources of their gas shipments, since it is in their interest to get their long-term supplies to the market.

7

Safety and security risks

In Annex A we have listed the most important economic, environmental and (geo)political risks in the international oil, natural gas and coal markets. Analysing the safety and security risks in the international energy markets crosses through the division between oil, natural gas and coal. Actors can choose from a variety of policy instruments to ensure a free flow of energy (oil and gas) from producer state to consumer state, including the employment of maritime assets with the objective of preventing and combating possible disruption and stagnation of the energy transport.

This section presents the chain process of the supply lines divided into a ‘dry’ (overland) and a ‘wet’ (over sea) route.

7.1. Supply line system

The transport of oil and gas from producer to consumer can best be described as a chain process containing several distinctive links depending upon the route taken and the transfer points and means employed. In general, the main routes can be distinguished as overland (pipeline or arterial system) or seaborne (by tanker). This distinction must be made, as security risks and the way to confront them are wholly dependent upon the set of inter(national) laws in force and thus the lawful use of any instrument of state.

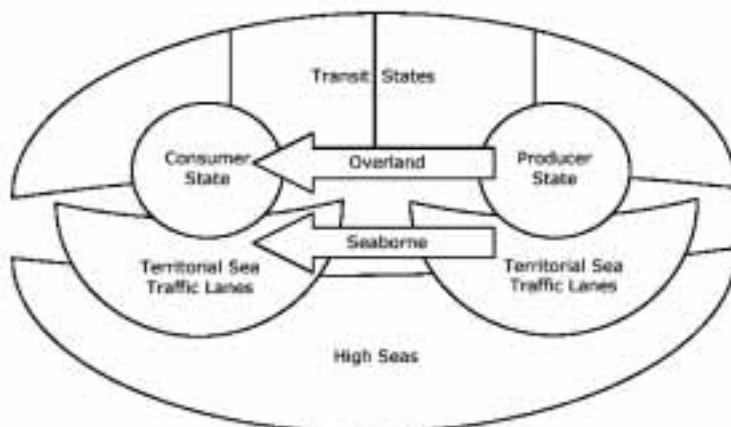


Figure 7.1 Chain process of energy supply

As is clear from Figure 7.1, the overland route consists of a chain of sovereign states in which only with consent of the host state and in strict accordance with national law provisions, foreign armed forces may be deployed to secure energy supply/transport. For the seaborne route a different set of conditions applies. Here the possibilities for deploying military-maritime assets are strictly regulated by international law, in this case, the United Nations Convention on the Law of the Sea (UNCLOS). The convention stipulates that in different sea areas different actors are responsible for implementing the rights and obligations of the convention and so-called “Good Governance at Sea”. These areas – indicated in the figure – are generally known as Territorial Sea, Sea Strait, and High Sea or international waters.

Within these areas several actors can be identified. First, there is the Coastal State with responsibility for enforcing law and order within its territorial waters, including the Sea Straits within or adjacent to these waters. In many cases there exists a shared responsibility of several coastal states, such as in the Malacca Strait where Indonesia, Malaysia and Singapore share the burden.

Second, there is the so-called flag state, whose flag is flown by the energy transport vessel. The flag state has rights and obligations when it comes to maritime security and safety issues. Important in the context of this study is the flag state's right to protect vessels flying its flag when they are transiting through Sea Straits or present in international waters. Furthermore, within the stipulations of UNCLOS any state has the right to pursue acts of piracy committed on the High Sea.

From the above description of the international regulations pertaining to the chain process of energy supply, it becomes clear that there is room for foreign policy initiatives at national, supranational or public-private levels to address security of energy supply lines.

In the case of The Netherlands as a consumer state, energy transport involves a mix of both routes. Typical routes of interest are the Persian Gulf, the Strait of Hormuz, The Cape of Good Hope, the Gulf of Biscay, the English Channel, and Rotterdam Harbour and its surrounding areas. Figure 7.2 illustrates the most important seaborne oil flows from producing to consuming countries expressed in millions of tons of oil per year. The lines represent approximate proportional width.

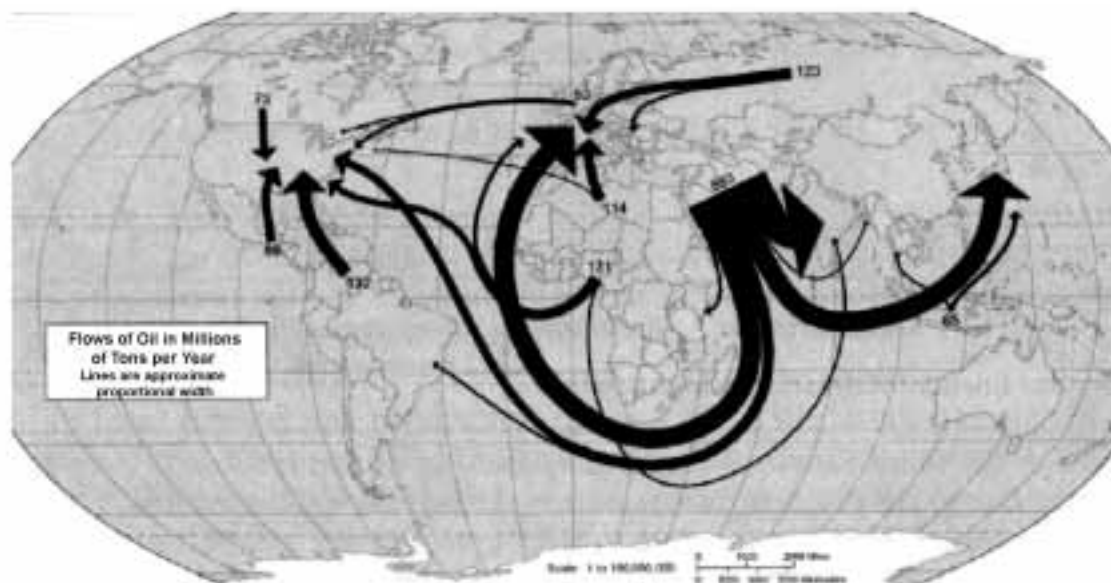


Figure 7.2 Flows of oil in millions of Tons per year¹

7.2. Critical link analysis

Prior to analysing the safety and security risks of the links typically involved in the EU it is necessary to establish which (inter)national laws or regulations (national and supranational conventions, agreements and treaties [e.g., UN UNCLOS/IMO resolutions; EC, EU and national regulations]) are applicable to the links involved. This will serve to identify the rights and obligations of the actors impacting on safety and security within the link area. It will also give an indication of the legal responsibilities and possibilities of the responsible authority involved in addressing safety and security risks.

¹ Source: Adams, N., *Terrorism and Oil*, US, Pennwell, 2003.

Extents of jurisdiction are studied at the national and supranational levels. At the supranational level, the UNCLOS for Territorial Waters is of particular interest, as is the Traffic Separation Lanes and High Seas and Agreements on waterways (Suez, Panama).

Actors with responsibilities for safety and security are producer/consumer states, coastal states (of relevance to transit and traffic lanes), flag states and shipping companies. Actors negatively impacting security are organised crime (including piracy) and terrorists.

8

Energy and climate

8.1. Energy and global warming

Burning of fossil fuels leads to air pollution. Small particles of soot, mostly from the transport sector, have a negative impact on health, and emissions of sulphates lead to acid rain. Such problems stretch beyond borders; acid rain in Western Europe has been combated regionally, since “acid rain was ravaging forests (and even the paint on houses) thousands of miles downwind from smokestacks that emitted sulphates.”¹ Acid rain and other energy related pollution remain a problem in the relations between countries. At the moment this is probably best illustrated by the acidification of Japanese soil caused by pollution originating in China, where both soot and sulphate levels in cities are among the highest in the world.

Another byproduct of burning fossil fuels is CO₂, one of the greenhouse gases.² Since the industrial revolution, the level of CO₂ in the Earth’s atmosphere has increased from 280 p.p.m. to 375 p.p.m. From 1970 to 2000 the rise was 60%. The average global temperature rose 0.6 degrees Celsius. On the basis of their expectations for economic growth, energy consumption, and the continuing dominance of fossil fuels - almost 90% of energy consumed - the International Energy Agency (IEA) predicts another 70% rise in CO₂ emissions in the period 2000-2030. By 2025 the developing countries will have surpassed the developed countries as the biggest source of new CO₂ in the atmosphere.³ Some 30% of current emissions come from the United States. East Asia, including China, will become a bigger source of new CO₂ in the atmosphere than the US by 2020. South Asia, including India, will surpass East Asia in 2040.⁴ However, emissions per capita will remain higher in the US and Europe.

Future emissions and their effects on global temperature are difficult to calculate. Inevitably such calculations require piling the assumptions about population growth and economic growth upon assumptions about technological developments. Furthermore, our understanding of the functioning of climate systems is still developing. The debate about whether there is human influence on climate change may not be over completely, although a vast majority of scientists, policy makers, and politicians acknowledge the problem.⁵ There is much more uncertainty about the extent of that influence, its consequences, and the direction in which solutions need to be sought.

¹ Weart, S. R., 2003: *The Discovery of Global Warming*; London, Harvard University Press, pp. 144.

² “Many chemical compounds found in the Earth’s atmosphere act as ‘greenhouse gases’. These gases allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth’s surface, some of it is reflected back towards space as infrared radiation (heat). Greenhouse gases absorb this infrared radiation and trap the heat in the atmosphere.” Gases that exhibit these properties and exist in nature are water vapor, carbon dioxide, methane, and nitrous oxide. Other gases, including sulphates, result strictly from human actions. Of human-related greenhouse gas emissions, some 75% is CO₂ from burning fossil fuels. The remaining 25% is also partly related to the use of fossil fuels. <http://www.eia.doe.gov/oiaf/1605/ggcebpro/chapter1.html>.

³ IEA, *World energy outlook 2004*, Paris, OECD/IEA.

⁴ Numbers are based on the so-called A1b-scenario of the 2001 Report of the IPCC. See: Vuuren, D. van, Strengers, B. and Eickhout, B., *A new IMAGE on future emissions and climate impacts*, Presentation at CoP-6-bis side event, July 25th, 2001. <http://arch.rivm.nl/iweb/iweb/index.html>.

⁵ “Cold facts or hot air?”, *Financial Times*, July 2, 2005. In the United States, “climate-change skeptics” have the upper hand.

The IPCC report of 2001 cites a range of possible scenarios.⁶ In these scenarios, temperature rise for the period 1990 to 2100 varies from 1.4 degrees Celsius to 5.8.⁷ The potential effects include vanishing coral reefs, retreating glaciers, the melting of polar ice caps and the ice in Greenland, rising sea levels, an increasing number of storms and droughts, and the shifting of climate zones.⁸ Countries now located in semi-arid areas could see a reduction of arable land. Atolls in the Pacific may disappear. Generally speaking, developing countries face the greatest consequences. Not only are they located in more sensitive areas ecologically; these countries do not have the financial resources to mitigate the negative effects of climate change.

8.2. Kyoto

1992 was a landmark year for recognition of man-made global warming and attempts to curb greenhouse gas emissions. During the United Nations Earth Summit in Rio de Janeiro a treaty was agreed upon to stabilise greenhouse gas emissions in the Earth's atmosphere. More than 186 countries, including the United States, ratified the treaty. A series of negotiations followed, culminating in 1997 with an implementation agreement, the Kyoto Protocol. In the Kyoto Protocol, the main historical polluters, OECD and transition countries (referred to in the treaty as Annex 1 countries) agreed to bring CO₂ emissions down 5.2% by 2012, compared with 1990 levels.⁹ Developing countries have no commitments. Despite numerous adaptations of the Protocol in subsequent conferences, including one in November 2000 in the Hague, the Bush administration, followed by Australia, decided not to ratify the agreement.

The Bush administration's key argument is that the US will not sign a treaty that harms the economic competitiveness of the American economy vis-à-vis rising economic powers such as China and India. Other countries tried to keep the US in the Protocol. Kyoto has an important provision for emission trading, largely because the Americans wanted it. In the Protocol not all of the reductions need to be achieved within a particular country. Through clean investments in developing countries (the Clean Development Mechanism) and transition economies (Joint Implementation), part of a country's reduction can be achieved elsewhere. Emission control in these other countries can be less costly so the reductions can be achieved more economically. The plan might also secure cleaner development paths in developing countries. The effectiveness of these measures remains to be seen.

The future of the Protocol hung in the balance once the US decided to opt out. Fifty-five countries and enough Annex 1 countries to represent 55% of the emissions of 1990 were needed to ratify the treaty before it came into force. Since the US alone was responsible for 30%, the fate of the Protocol was in the hands of Russia, responsible for 17%. Only after long negotiations between Russia and the EU, the biggest

⁶ IPCC, *Climate Change 2001: Synthesis Report. Summary for Policy Makers*. <http://www.ipcc.ch>.

⁷ The temperature is an average increase. The globe will not be affected uniformly. Certain areas, especially the North Pole, will see a stronger increase. The many variables within a climate change make it difficult to predict the consequences in each region. There might even be a cooling of Western Europe if melted ice from Greenland and the North Pole disrupts the warm Gulf Stream, the North Atlantic arm of the global thermohaline conveyor. This possibility is also central to a highly debated report that consultants wrote for the Pentagon in which abrupt climate change is seen as a plausible, although not the most likely, scenario, with severe impact on the national security of the United States. Schwartz, P. and Randall, D., *An Abrupt Climate Change Scenario and Its Implications for United States National Security*, October 2003. <http://www.ems.org>.

⁸ The exact changes depend very much on the adaptability of the Earth's climate system. Scientific research of ice cores since the 2001 IPCC report has disclosed that rapid climate change, a dramatic shift, is possible within a century and perhaps even a decade. Change more rapid and serious than currently expected could occur. <http://www.aip.org/history/climate/rapid.htm>.

⁹ The Netherlands played an important role in the creation of the Protocol, first in the EU and later as part of the EU in negotiations with other countries. For insight into the role of The Netherlands and the internal Dutch dynamics see Kanie N., "Domestic capacity, regional organization and global negotiation: lessons from The Netherlands-EU Kyoto Protocol negotiation", in: Faure, M., Gupta, J. and Nentjes, A., *Climate Change and the Kyoto Protocol: The Role of Institutions to Control Global Change*, Cheltenham (UK), 2003, pp 230–247.

driving force behind the Protocol, did Russia agree to ratify in what seems to have been a package deal. This included the support of the EU for a WTO membership for Russia.

The Kyoto Protocol came into effect on February 16, 2005. This has led to both celebrations and protests. The protesters are an odd mix of people, among them economists who say that Kyoto is not an economically viable solution, liberal politicians who think the Protocol is too state-oriented, European businessmen who express their concern about the international level playing field where their businesses operate, and representatives of NGOs who see the Kyoto protocol as only a small step stopping global warming.

The latter is not under dispute. Kyoto has always been presented as a first small step — but a step necessary to gain experience in effective climate policies, to build international consensus, and to build trust and commitment for the large-scale emission reductions to come. Considering the long and difficult road of the Protocol so far and the apparent problems of countries such as Japan and The Netherlands in achieving the Kyoto targets, it is an open question as to whether this first step is too ambitious. From the eight countries in table 2.1 that have Kyoto commitments, France, Germany, Russia and the United Kingdom are closest to reaching their targets in 2012. However, all four countries are predicted to have rising emissions in the coming years.¹⁰

8.3. Post-Kyoto and the most important actors

The focus and attention of the international community has changed considerably since the first round of climate negotiations began in the early nineties. In the wake of the fall of the Berlin Wall it seemed that a new era of cooperation and multilateralism had begun. In the post 9/11 world, however, national objectives and security issues have risen on the political agenda, especially but certainly not exclusively in the US. International agreement now seems more difficult to achieve, and the role of international institutions appears to have been weakened. Possible storylines for the future are discussed in the next chapter. The direction world events take will have a considerable impact on post-Kyoto negotiation processes.

The EU has announced that it wants to limit the rise in temperature to two degrees Celsius in comparison to pre-industrial levels. Based on the current climate models, this means that the average amount of CO₂ in this century needs to stabilize around 550 p.p.m.¹¹ Such an overall target is not global policy and will be part of future post-Kyoto negotiations. The real challenge will be to find consensus between the major actors – US, EU, China, Russia, India, Japan and Canada - on their commitments to reduce emissions and the principles upon which these commitments will be based.

¹⁰ France has seen rising emissions in transport and households. In the projections this rise can no longer be offset by industrial emission reductions. Germany had an ambitious Kyoto target, because it included former East Germany. The declining trend can be explained by Germany's dismantling or cleanup of industrial and power plants in former East Germany and by promotion of renewables. The enormous downfall of the Russian economy during the 1990s explains why Russia is so far below its Kyoto target. However, Russia is an extremely inefficient energy user and has one of the highest CO₂ emission levels per unit GDP worldwide. Although staying below the Kyoto target, CO₂ emissions are expected to increase now that economic growth is back on track. The UK is below the Kyoto target, but 2003 and 2004 has shown increases again, so the UK will end up on or around the Kyoto target in 2012. Source: Ecofys and WWF, *Climate Scorecards; comparison of the climate performance of the G8 countries*, 2005. <http://www.ecofys.nl/nl/publicaties/documents/g8scorecardsJuly2005.pdf>.

¹¹ France has announced a national target of 75% decrease of emissions in comparison with 1990 level by 2050.

Country	Past emission trend from 1990-2003	Current distance to Kyoto target	Emissions per capita tCO ₂ eq/cap	Emissions per GDP tCO ₂ eq/MUSD
Canada	20%	26%	23	807
China	33% *	--	3.9	1024
France	-1.9%	-1.9%	9.3	360
Germany	-18.2%	2.8%	12	464
India	41% *	--	1.8	745
Italy	11.5%	18%	10	370
Japan	8.3%	14.3%	10	386
Russia	-35%	-35%	13	1858
Netherlands ^a	1.1%	6.1%	13.1	453
United Kingdom	-13%	-0.5%	11	435
United States	13%	20%	24	694

a. Based on figures from RIVM, *The Netherlands NIR*, 2004 by the RIVM. <http://www.rivm.nl>. From 1990-2002. Distance to Kyoto in 2002. Population 2002 16.192.572, <http://www.cbs.nl>. GDP in PPP USD in 2002.

Table 8.1 Overview of emissions of the G8 countries, China, India and The Netherlands¹²

* From 1990-2000

In the 2005 European Commission communication “Winning the battle against global climate change” a so-called staged approach is being discussed. On the basis of a set of indicators, for example GDP, countries are divided into groups. Some receive absolute ‘Kyoto-like’ targets. For countries with strong economic growth there can be intensity targets to decouple economic growth from growth in CO₂ emissions. The negotiations will probably focus not on the overall design, but on the set of indicators and what it means for the different countries. Will China receive an absolute target, or will it fall under one of the other categories? The same questions can be asked with regard to India or Russia. And how will the US react if China’s target indicators are markedly different from those of the US?

A staged approach leaves room for the development-first principle, which is part of Kyoto and which also has to be part of a successor, considering UN millennium goals to reduce poverty. Developing countries will be assisted in reaching sustainable economic growth until their GDP meets the target indicators, at which point a different set of regulations becomes applicable. The problem again lies in setting the indicators. At what point should certain countries be placed in a new category? This question is the most pressing for China and India, which in absolute GDP terms belong to the top twenty economies of the world, while their per capita GDP is still low.

On July 28 of this year, the United States together with Australia, China, India, Japan and South Korea¹³ envisioned an Asia Pacific Partnership on Clean Development and Climate (APPCDC). In this partnership the desire is expressed to develop, deploy and transfer cleaner, more efficient technologies and to meet national pollution reduction, energy security and climate change concerns, consistent with the principles of the UN Framework Convention on Climate Change (UNFCCC).¹⁴ In this partnership, the different partners are free to set their own goals of reducing emissions, and no enforcement mechanism is incorporated (in contrast with Kyoto). The focal point of this agreement is the exchange of technologies for clea-

¹² Source: Ecofys and WWF, *Climate Scorecards; comparison of the climate performance of the G8 countries*, 2005. <http://www.ecofys.nl/nl/publicaties/documents/g8scorecardsJuly2005.pdf>.

¹³ Together these six states represent more than 50% of greenhouse gas emissions.

¹⁴ US Department of State, <http://www.state.gov/g/oes/rls/fs/50335.htm>.

ner energy. Within Kyoto this appears to be much more difficult, because technology exchange has to be approved by UN inspectors and is therefore subject to a rather cumbersome bureaucratic process.¹⁵ So far it is unclear whether the new initiative will contribute to or conflict with establishing a better starting point for a post-Kyoto strategy.¹⁶

8.4. EU position

In a time of changes to the political landscape and a world economy where non-Western countries are increasing in importance, the EU cannot take the sole lead in fighting man-made global warming. The chance that the EU will bear enormous costs without having a significant effect is too great.¹⁷ At the same time, it is clear that action needs to be taken and that none of the important actors except for the EU seems to be ready to take on a leadership role.¹⁸ The latest communications from the European Commission recognise this difficult position and are an attempt to formulate a policy around it. The aim of the EU policy will be a multilateral treaty similar to the Kyoto protocol and falling within the UNFCCC. Before making clear what the possible commitment is of the EU after 2012, the EU is aiming for a series of bilateral talks to figure out the position of the other actors and what the possibilities are for a post-Kyoto treaty.

However, a new overall agreement may be long in the making and might even fail considering the objections of the United States and possible opposition by the major developing countries. It might therefore be a good strategy to expand the bilateral talks beyond climate change and take into account numerous other energy-related issues in which multiple objectives might be reached. In the meantime, the statement of the G8 might be seen as a step backwards in comparison to the Kyoto Protocol and even previous G8 statements. It is, however, the closest the world has come to recognising climate change as a global problem and to suggesting some steps toward solving climate change. Since the Bush Administration decided not to participate in Kyoto, the G8 statement is the most encouraging sign on an international level in quite some time.

¹⁵ Chrystal, B., "Clean energy special: the big clean up", in: *New Scientist*, September 2005 <http://www.newscientist.com/channel/mech-tech/mg18725151.400>.

¹⁶ See also Perlot, W., *Post-Kyoto and the position of the European Union*. CIEP briefing papers number 2, 2005, <http://www.clingendael.nl/ciep>.

¹⁷ This difficulty is recognised more and more as also becomes clear from the most recent energy report of the Dutch Ministry of Economic Affairs. Ministerie voor Economische Zaken, *Nu voor later, Energierapport 2005*. <http://www.minez.nl>.

¹⁸ As is clearly being done this year by the UK government in putting climate change on the G8 agenda.

9

Energy and poverty

9.1. Without energy

Energy is vital for developed economies to maintain current levels of welfare; it is also vital for developing countries as a precondition for development and economic growth. Not only does energy consumption grow with economic growth, but energy is a necessity for economic growth and to reach higher levels of welfare.

In the World Energy Outlook of 2004, the International Energy Agency presented for the first time an Energy Development Index (EDI). It is based on three factors: per capita consumption of commercial energy, national share of commercial energy in total world-wide energy consumption and the share of the population with access to electricity.¹ More interesting is that this EDI is compared with the Human Development Index (HDI) of the UNDP. This comparison clearly shows the correlation between low levels of EDI and low levels of HDI. Especially in the poorest countries, increase in EDI and HDI seem to go hand in hand until a certain level of HDI is reached and increased energy consumption no longer leads to strong increases in HDI.

It is currently estimated that 1.6 billion people do not have access to electricity. Electrification rates have increased slightly over the past decades, but improvements have been largely offset by population growth. The number of people without electricity is lower now than in 1990, but that is because of the massive achievements of China. Without China, access to electricity would have decreased in the past three decades.² Between now and 2030 about two billion people are expected to gain access to electricity. However, due to population growth, the number of people without electricity will still be 1.4 billion.³ Most of these people will be located in South Asia and sub-Saharan Africa.

China has been very successful in decreasing energy poverty. As a side effect, the amount of greenhouse gases emitted by Chinese coal-fired power plants has increased sharply. Although no one will dispute the right of poor people to energy, the case of China clearly shows the problematic implications: increased pollution levels and increased demand for fossil fuels. Higher electrification rates lead to higher economic growth, higher household income, higher energy consumption, and higher emission levels. The priorities of the international community, on the one hand to address global warming and on the other to reduce energy poverty, are conflicting in this case.

It is doubtful that the targets mentioned above will be reached. Reducing energy poverty requires confronting traditional development-related problems. First of all, funds are needed to invest in power plants and infrastructure. Development aid is not enough to supply the funds needed; moreover, such aid also has to be used for other development goals. The willingness of companies to invest billions of dollars is low. Regulatory frameworks and rules of law in general are largely lacking in most developing countries. Creating a market for electricity, i.e. customers who can afford to pay electricity bills, is also problematic. Unpaid invoices and illegal tapping of electricity are major problems in developing countries. The promotion of good governance and the implementation of market forces as called for at the Energy for Development

¹ IEA, *World Energy Outlook 2004*, Paris, OECD/IEA, pp. 339-346.

² *Ibid.*, p. 339.

³ *Ibid.*, P. 348.

Conference, as organised by The Netherlands in Katwijk in December 2004, is easier said than done.⁴ These two issues have been on the development agenda for years.

9.2. International commitment to decrease energy poverty

The need for energy to fuel growth and the need for a certain amount of welfare to pay for electricity and other forms of commercial energy is a chicken-or-egg problem. Without strong financial backing from major donor countries, new energy projects in developing countries are unlikely to get off the ground, and the problem remains that if the investments fail to kick-start economic growth there will be no funds available for maintenance. Large-scale subsidising of energy use to first create demand is also problematic. Subsidisation will distort market forces and will also create social unrest when the time comes to decrease subsidies.

However, one of the Millennium Goals adopted by the United Nations is the eradication of extreme poverty and hunger. One of two targets to measure progress in achieving this goal is to halve the number of people living on 1USD a day by 2015. "Because of the strong link between income and access to electricity, meeting this target implies an enormous increase in electrification rates in very poor countries."⁵ Reaching this target is very difficult without improving access to electricity for poor people. In the period until 2015, electricity should become available to at least 500 million people, which will cost as much as 200 billion USD.⁶ On top of that, modern cooking and heating fuels will need to replace traditional biomass consumption and be made available to at least 700 million people by 2015 to reach the 1USD target.⁷ Availability of energy is also helpful in reaching other Millennium Goals as well.⁸

As the situation stands now, the Millennium Goals will not be reached since the EDI will not substantially improve in the coming decade. The only way to change this situation is with new policies, good governance and increased funding. Perhaps the recent attention on Africa and the statements flowing from the G8 justify some optimism. However, the challenge that energy poverty is posing in combination with other development and energy problems should not be underestimated. Past experiences justify reservations as to the extent to which such ambitious goals can be reached.

⁴ Kok, M.T.J. et al., *Energy for development 2004; conference paper*, December 2004 and *Energy for development 2004 conference; chair's conclusions*, Noordwijk/ Netherlands, 14 December 2004. <http://www.energyfordevelopment.org>.

⁵ IEA, *World Energy Outlook 2004*, Paris, OECD/ IEA. p. 350.

⁶ Ibid.

⁷ Ibid.

⁸ UNDP, UNDESA, WEC, *World Energy Assessment - Overview: 2004 Update*, New York/ USA, <http://www.undp.org/energy>.



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