

National energy policy in the context of the Northwest European market¹

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Faced with the consequences of an unbundled and regionalizing market, combined with a growing number of targets and policy measures that are being determined in the EU domain, national governments increasingly struggle to formulate a meaningful and effective national energy policy. A recent study by the Clingendael International Energy Programme focuses on these challenges and pays attention in particular to the international dimension and issues related to the fuel mix and infrastructure.

An emerging Northwest European power market

The regional integration of power markets in Northwest Europe is progressing in a gradual fashion, as cross-border interconnection capacity is being expanded. Just as historically provincial grids merged together into national electricity grids, increased grid integration is taking place at a supranational level at many different countries within Europe. Frontrunner in this trend has been the Scandinavian power market, where the first full market coupling took place with the creation of the Nordic Power Exchange (or Nord Pool) between Denmark, Norway, Sweden and Finland, which has been in operation now for several years. Moving in this direction, Germany, France and the Benelux have joined in the "Pentalateral Forum" with the aim of increasing cross-border connectivity and making smarter use of the existing interconnections. A next step, scheduled for September this

year, will be the addition of Luxembourg and Germany to the "Tri-Lateral Market Coupling (TLC)" already in existence between the Dutch, Belgian and French power markets to establish an integrated Central Western European (CWE) electricity market.

For the Netherlands, interconnection capacity is growing not only through overland connections but also by subsea cables with Norway (via NorNed, completed in 2008), the United Kingdom (via BritNed, construction started in 2009 and expected to be ready in 2011) and Denmark (via COBRA, still in planning phase). Even though the utilization and management of the interconnection capacity in Europe still leaves much room for improvement, the market coupling resulting from these increasing linkages and the cooperation within the Pentalateral Forum is expected to lead to a gradual convergence or 'harmonization' of electricity prices. Figure 1 shows a potential future sequence of European power market integration which was presented as part of discussions at the 17th EU Electricity Regulatory (Florence) Forum meeting of December 2009.

A second important trend taking place is the consolidation among European energy companies and the emergence of pan-European utilities. As a consequence of the unbundling process and market liberalization that have been put forward in the EU context, energy companies have increased their operations across borders. Major mergers and acquisitions have taken place, such as the merger between GDF and

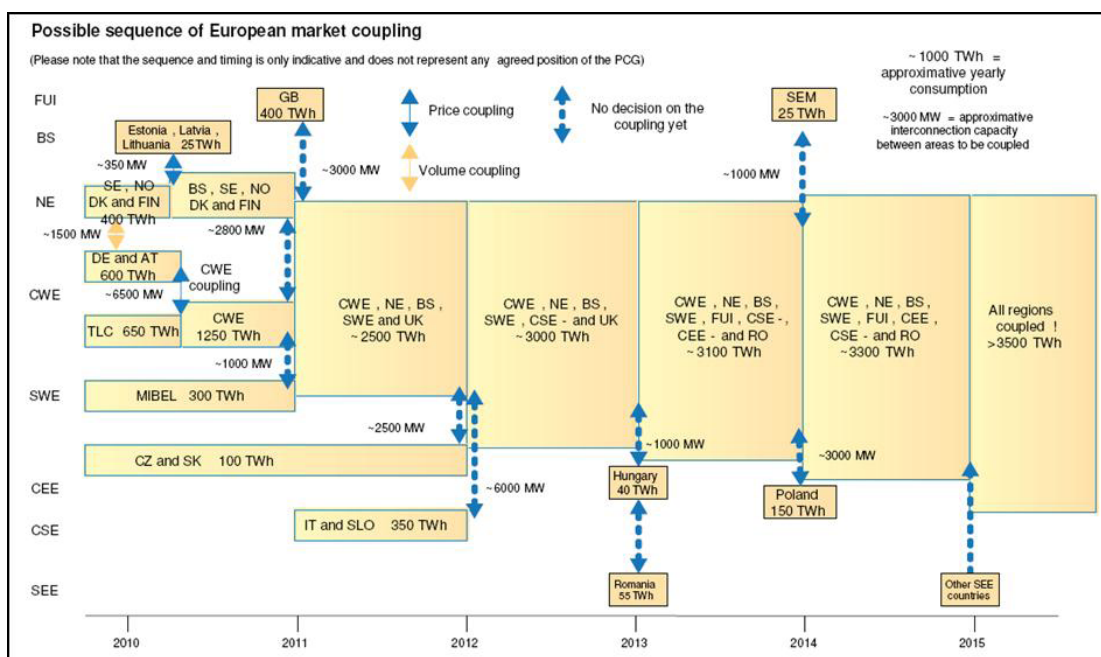


Figure 1. Potential sequence of European market coupling. Source: PCG Report to the XVIIth Florence Forum, 10&11 December 2009, Rome. Available online at: http://ec.europa.eu/energy/gas_electricity/forum_electricity_florence_en.htm.

Suez, the take-over of Endesa by Enel and Acciona, and the acquisition of power generation assets of Enel and Endesa by E.ON. Regarding the situation in the Netherlands, the takeover of Nuon by Vattenfall and Esent by RWE are cases in point. Given that many of the large firms hold a wide range of assets in the whole European market, they base their investment decisions not only on national energy market conditions or national energy policies, but weigh in considerations on their overall power plant portfolio and aim to spread risks related to capital investment and fluctuations of fuel and carbon prices².

Changing supply and demand patterns and the role of infrastructure

The impediments to a transformation towards a single European internal electricity market are manifold, but particularly challenging are the demands put onto infrastructure – both in terms of creating sufficient regional interconnection capacity, as well as accommodating more dynamic supply and demand patterns. There are several trends which can be identified. First of all, on the supply side, there is the increasing use of intermittent renewable energy sources. Of course this holds especially for the growth of wind energy, which already occupies a significant share of the energy mix in several EU member states and which ranked first in terms of the volume of newly installed capacity in the EU as a whole in 2008 and 2009. A second development is the (expected) growth of decentralized power generation. Integrating the supply of electricity by a large number of small-scale and dispersed sources requires the grid to be able to handle multi-directional flows and more complex balancing conditions.

On the demand side, it is expected that a trend towards electrification in various sectors will lead to a continued growth in electricity demand: for instance by a wider deployment of electric heat pumps and plug-in (hybrid) electric vehicles. The introduction of smart metering in combination with smart grids will be important to promote demand-side responsiveness: itself another key element in order to manage the increasingly volatile and complex dynamics of electricity supply and demand. However, for the deployment of smart metering and smart grids large investments are needed.

It is broadly recognized that increased regional interconnection can serve to balance out fluctuations in supply and to allow for a more optimal deployment of renewable energy sources across Europe. More generally, the coupling of electricity markets can permit a more efficient use of power generation assets. Experience proves that increased regional integration will be essential to accommodate the increased demand for flexibility in power generation, energy storage and balancing options that comes with a large-scale deployment of renewable energy sources. This is illustrated by the example of Denmark: the growth of wind power in Denmark would not have been possible without the opportunity to import and export electricity through strong interconnections with Norway, Sweden and Germany. In this case, the pumped storage and hydropower capacity in Scandinavia serves as a very effective means of providing a secure electricity supply complementary to the variable wind energy production. In future, there will be a larger role for balancing base-load electricity generation, intermittent renewable energy sources and flexible (gas-fired) power plants at a regional level.

The trends indicated above yield new requirements on infrastructure, both in terms of investment and management, and they put into ques-

tion the adequacy of current practices. Discussions have been going on as to whether current regulatory regimes and efficiency improvement obligations for system operators are sufficient to ensure the grid is future-proof³. There are also doubts whether sufficient large scale investment in cross-border interconnection capacity will materialize under current circumstances.

Another aspect to consider is that the new requirements for infrastructure mean that the cost balance between investments in production and infrastructure (both transmission and distribution) is shifting. Instead of being significantly smaller in terms of expenditure, it is projected that infrastructure investments in coming decades will become as important as investments in power generation capacity. This calls into question whether the subordinated role of infrastructure development with regard to power generation capacity should be maintained: should infrastructure continue to follow production without any conditions attached? There are good reasons to consider how a more coordinated approach can be developed, without interfering with market principles.

Implications for national energy policy making

A consequence of European market liberalization is that national governments are left with rather limited means to influence domestic energy markets. The most important instruments available are in the field of permitting procedures, regulation on environmental matters, subsidies and taxes. Scope for domestic policy is further limited since a major part of greenhouse gas emissions is currently regulated through the EU Emission Trading Scheme (EU ETS), of which the cap and allocation method of emission rights will become a strictly European prerogative from 2013 onwards.

The increasing regionalization also carries a series of consequences for policy making at the national level. First of all, due to increasing share of cross-border electricity flows, technical security of supply in terms of grid stability is increasingly a supranational question: in the case that a grid failure occurs in Northwest Germany, the impact on the Netherlands will likely be bigger than on Bavaria. The prospect of increasing interdependency points out the need for more cooperation and coordination at a regional level and makes it distinctly less sensible to only consider policies aimed at the national situation.

In fact, it can be argued that increased market integration makes it more difficult for European governments to follow their own nationally-specific policy that will impact locational advantages, such as the implementation of mandatory CCS requirements or emissions performance standards. Such nationally diverse measures do not seem desirable given the regional or even global objectives that these policy measures are intended to serve and given the fact that they might very well be detrimental to the overall effectiveness of the policy. This point has been raised often with respect to the optimal deployment of renewable energy sources and cost-effective lowering of greenhouse gas emissions within Europe. Again taking the Netherlands as an example, the unilateral implementation of very strict requirements on coal-fired power plants might lead to the decreased use or closure of such plants in the Netherlands, even though their plant efficiency might be greater than German coal plants located across the border.

In many European Member States discussions on the fuel mix still take place as if it were a solely a national affair: the fierce debates over

the expansion, extension or decommissioning of nuclear power plants being a key example. Yet, in particular for policies related to the fuel mix, it would make good sense to look at the regional context. Many of the concerns as well as the benefits, such as addressing climate change or increasing energy security, transcend the national interest. Moreover, it is recognized that trading and market coupling at a regional level will be necessary in order to achieve a minimization of costs related to the promotion of renewable energy sources.

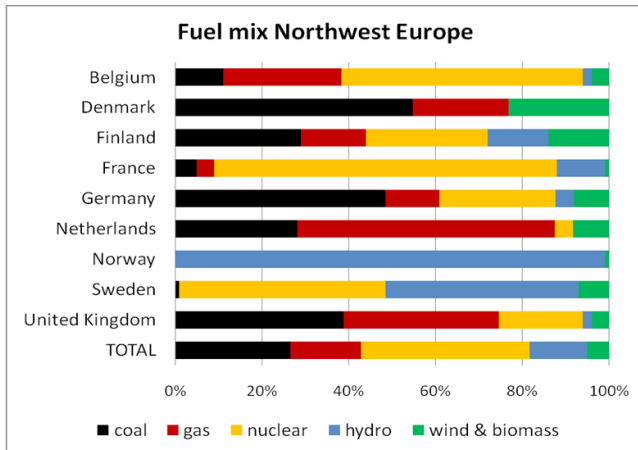


Figure 2. The fuel mix in Northwest Europe (2006). Source: DG TREN, EU Energy and Transport in Figures (gross electricity production), 2009.

When considering fuel mix issues in a regional context, it is worthwhile to notice that the Northwest European market as a whole has a rather balanced fuel mix, even though national markets have their strong peculiarities. If we look at the overall fuel mix of Northwest Europe, as illustrated by Figure 2 we see that the largest share of generated electricity comes from nuclear power (38%): of course due to France in particular, but also because of large shares in Sweden, Belgium and Germany. It is followed by coal (26%), which plays an important role in the UK, Germany and Denmark, and gas (16%). In terms of renewable energy sources there is a large share of hydro (13%); non-hydro renewable energy sources (such as wind and biomass) only occupy a share of 5%. Utilizing existing complementarities, insofar as possible, will need to play a larger role in future.

Conclusions

A discrepancy is growing between the effectiveness of national energy policy instruments and the evolving regional power markets in North-

Footnotes

¹ This article is based upon the Clingendael Energy Paper “Energy Policy and the Northwest European Market. Fuel Mix and Infrastructure” Available online in both Dutch and English at: <http://www.clingendael.nl/ciep/publications/energy-papers/?id=7826&&type=summary>

² Clingendael Energy Paper, “Energy Company Strategies in the Dynamic EU Energy Market (1995-2007)”, 2010. Available online at: http://www.clingendael.nl/publications/2010/20100608_CIEP_Energy_Paper_Energy_Company_Strategies.pdf

³ Algemene Energieraad (AER), “De Ruggengraat van de Energievoorziening”, September 2009.

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western Europe. On the one hand there are national targets, such as those related to the fuel mix and the share of renewable energy sources, as well as policy instruments such as subsidy schemes, fiscal measures and permitting procedures which can be utilized at a national level. On the other hand, much of the issues at stake cannot be dealt with in a meaningful way at only a national level. Grid stability, the development and accommodation of renewable energy sources are becoming supranational issues. Operations of European utilities extend across borders and an increasing share of policy and regulation is being made at a European level. It can be concluded that we are in a twilight zone in which the development of the fuel mix is still a part of national policy despite a growing impact of international factors.

Consequently, the observations made here call for a more supranational approach and greater regional coordination, for instance through bodies such as the Pentalateral Forum.

Second, it can be argued that there are reasons for governments to consider playing a stronger role in guiding investments and utilization concerning infrastructure. As infrastructure becomes more critical in terms of costs and deployment, it may become a stronger instrument for the government to influence developments within the power market. This holds for facilitating the expansion of cross-border interconnection capacity and the introduction of smart meters and smart grids. Another example is government involvement in the arrangements necessary for linking offshore wind farms to the grid. In order to avoid costly investments that might turn out to be unnecessary in the longer run, a closer cooperation on infrastructure development between government, market players and transmission system operators is warranted. To this end, it will be important for policy makers to attempt to sketch as clearly as possible a vision on the future of the energy landscape, however difficult that may be. At a European level attempts to improve coordination are also being made, for instance by requiring the European Network for Transmission System Operators for Electricity (ENTSO-E) to publish a Ten-Year Network Development Plan that provides an outlook on European infrastructure development. National energy policy is embedded in a changing regional context: the more that this will be taken into account, the better chances are that policy can be set out that will be effective and sustainable in the long run.