



## **European Energy Markets: Moving in a Common Direction?<sup>1</sup>**

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### **1. Introduction**

The road to full liberalisation of EU energy markets has still a long way to go. More than ten years after the process started, the energy sector in Europe is still highly concentrated, cross-border trade in energy is limited and prices differ substantially from country to country. European energy markets are poorly integrated not only because of the technical difficulties attached to energy markets but also because of the weak political support to the process of integration.

This paper highlights the main obstacles to integration of EU energy markets and analyses briefly the potential impact on market integration of the new legislation recently proposed by the European Commission in the fields of energy and climate change.

The existing conflicts between increasing global efficiency derived from further integration and national interests have to be addressed explicitly if the EU wants to continue making progress in the process of liberalisation.

### **2. A Common Market for Energy?**

Despite the process of liberalisation and regulatory harmonisation started by the European Commission in the mid-1990s, energy policy in the EU has traditionally remained a national issue. The European energy sector has remained fragmented not only due to the technical complexity of energy markets and to the geography of Europe but also due to the lack of political initiative at national level to eliminate obstacles to market integration. Despite the technical difficulties of establishing and managing large energy markets, there is still scope for further regional integration and overall price convergence.

The current picture of the EU energy sector is very fragmented. The energy mix differs substantially from country to country which stems from different policy priorities and concerns. Prices for gas and electricity also differ greatly.

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The European energy mix is composed of sixty percent oil and gas, twenty percent coal, fourteen percent nuclear and six percent hydro, renewable and other sources of energy. The energy mix however varies substantially across EU states. For example, forty percent of France's energy consumption is nuclear energy while gas only represents fifteen percent of the primary energy consumption. By contrast, in Germany, gas and coal constitute almost fifty percent of the total primary energy consumption and nuclear energy represents slightly above ten percent. This means that the concerns and priorities of France and Germany differ. While France is keen on expanding its nuclear base, Germany has a phase-out plan for nuclear energy and is looking to secure its gas supplies and promote the use of its domestic coal reserves and its renewable resources. Energy mix differs from country to country and so do each country's policies and priorities.

In addition, the energy dependence on non-EU countries also differs as well as the origin of such imports. For example, eighty percent of the energy consumed in Spain is imported (mostly gas and oil) while for Germany this figure is slightly above sixty percent. The origin of such imports is diverse. Germany obtains half of its gas imports from Russia while Spain's gas imports come mostly from Algeria and Nigeria. The lack of interconnection between the German and the Spanish gas markets implies that the external policy priorities of both countries regarding gas will differ. Given the different degree of import dependence and the diversity in the origin of such imports, it is difficult to find common interests amongst EU countries for their external energy policies.

What determines the energy mix? The energy mix is primarily determined by geographical factors and the availability of natural resources (eg the abundance of lignite in Germany and Poland, hydro resources in Nordic countries and Austria and biomass in Sweden and Finland) but also by political decisions. For example, the reaction of EU countries to the 1970s and 80s oil crisis or to the Chernobyl accident varied substantially. Sweden, for example, promoted heavily the investment in renewable energy after the first oil crisis. In 1980, after a national referendum, Sweden decided to phase out nuclear power. Italy decided, after the Chernobyl disaster, to shut down its four nuclear power plants. Other European countries such as Spain, Germany, Austria, the Netherlands or Belgium have decided to phase-out their nuclear programmes. On the other hand, France, Finland and several new member states have active nuclear programmes. Also, the share of renewables in the energy mix does not only depend on the availability of resources but also on the existence of specific policies to support the deployment of renewable technologies. Germany, for example, has in place generous policies to support renewables which have resulted in a rapid deployment of wind mills and solar panels. The level of commitment of different governments to implement climate change policies also contributes to determine the energy mix.

A common price for energy would indicate the existence of a common market for energy. Prices for gas and electricity differ however substantially across Europe. Wholesale gas prices are in most European markets determined by indexation mechanisms (mainly to oil and oil derivatives). Only a small share of gas is traded in the three main trading hubs NBP, Zeebrugge and the TTF. As reported by the European Commission's recent sector inquiry on energy<sup>3</sup>, prices determined by indexation mechanisms differ from hub prices. In general, long-term contracts

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<sup>3</sup> DG Competition report on the energy sector inquiry, 10 January 2007, paragraph 310. Available at <http://ec.europa.eu/comm/competition/sectors/energy/inquiry/index.html>

indexed to oil are much less volatile than those indexed to hub gas prices. There are no signs of price convergence, which shows the limited arbitrage possibilities between different markets due to the lack of interconnection.

In the case of electricity, prices also diverge across the EU both at wholesale level<sup>4</sup> but mostly at consumer level. Retail prices for different countries differ substantially even where wholesale prices are similar as is the case for France and Germany.

### **3. Obstacles to a Common Energy Market**

The obstacles to a common market for energy can be either of a technical or of a political/economic nature.

The technical barriers have to do mainly with the characteristics of energy. First, energy relies on a physical network which makes markets less liquid and adds technical complexity in the operation of markets. This implies some inherent tendency of energy markets – mainly gas and electricity markets – towards regional fragmentation. Electricity is non-storable and transportation is economically feasible only over limited distances. Non-storability of electricity strengthens the above-described tendency towards regional fragmentation. More importantly, it even creates strong interdependence between regions with respect to the operation of the network: network operators have to be closely coordinated in order to make trade possible.

The reliance on a network and the existence of geographical barriers do not always permit trade between different regions. This is for example the case of the UK or Ireland whose insular situation limits their interconnection with the rest of Europe. The Iberian Peninsula is also to a certain extent isolated from the rest of Europe.

However, not only is physical interconnection scarce but it is also, in many cases, underutilised. For example, some cross border interconnections in Europe are not governed by market mechanisms such as auctioning of capacity and market splitting which makes the operation of such interconnections suboptimal.<sup>5</sup> In many instances, existing cross-border interconnections do not respond to economic criteria but to arbitrary reliability criteria defined by system operators on each side of the border. Even in the cases where market mechanisms are in place, different market designs at each side of the interconnector mean that the result is not always efficient. For example, the sector inquiry reports that in 2004 for 40 percent of the hours of interconnection capacity between Germany and the Netherlands was allocated in the direction Germany-to-Netherlands even if prices in Germany were higher than in the Netherlands.<sup>6</sup>

The existence of multiple uncoordinated Transmission System Operators (TSOs) and the existence of different market designs in different countries also make cross-border trade difficult. For instance, the different imbalance settlement periods (for TSOs to balance the market) across EU countries limit the possibility to trade across different regions.

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<sup>4</sup> See Figure 38 in page 11 of the sector inquiry.

<sup>5</sup> See pages 184-185 of the sector inquiry.

<sup>6</sup> See sector inquiry, paragraph 552.

But perhaps the most important obstacles are of a political and economic nature<sup>7</sup>. The degree of implementation of the liberalisation directives and of competition law differs from country to country. Some governments have favoured the emergence of national champions arguing that they help to secure their energy supplies. There are several recent examples throughout Europe (e.g. E.ON/Ruhrgas in Germany in 2003, the failed acquisition of Endesa by Gas Natural in Spain in 2006 and the ongoing merger between Gaz de France and Suez in France/Belgium) where governments have promoted the creation of large national champions, thereby reducing competition, arguing that such mergers and takeovers promote supply security and investment. In many cases, governments also keep substantial economic interests in energy companies which might constraint business decisions and might be an impediment to the acquisition of such firms by private investors. The French EDF and GDF, the Italian ENEL, the Swedish Vattenfall or the Hungarian MVM are examples of dominant players where the respective states hold substantial stakes.

The integration of markets might also not be politically desirable by some governments especially in those countries that have relatively cheap energy sources. In a market where prices are determined by the marginal technology, market integration might cause a price increase in the country with the lowest cost marginal technology. Even if the global outcome of integration is more efficient, the uneven distribution of the gains might discourage some governments from pursuing further integration. This could be the case of France, where full integration with neighbouring countries might cause an increase in the price of electricity since most technologies have higher marginal costs than nuclear energy which is predominant in France.

With the argument of securing national supply, governments might favour bilateral agreements between their energy companies and foreign suppliers and limit the interconnection with other countries in order to make sure that gas remains within the national borders. An example of this strategy is the Baltic Sea Nordstream gas pipeline that links Russia with Germany, bypassing other European countries.

Finally, some of the current measures to fight climate change such as the policies to support the deployment of renewable energies have a national character and might contribute to the fragmentation of energy markets. For example, higher subsidies for renewable energy in a specific country might increase the cost of electricity and might cause prices to differ from country to country. Equally, investment decisions can be distorted by the existence of different mechanisms to support renewable energies and by the different allocation of emission permits in the context of the European Emissions Trading Scheme.

#### **4. What Do the Latest Proposals for Energy Regulation Mean for Market Integration?**

With the aim of increasing the efficiency of energy markets, fighting climate change and securing Europe's energy supply, the European Commission published in March 2006 a Green Paper on energy<sup>8</sup>. After the 2007 Spring Council gave its green light to

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<sup>7</sup> See Röller, Lars-Hendrik, Juan Delgado and Hans Friederiszick. *Energy: Choices for Europe*. Bruegel Blueprint Series. March 2007. Available at [www.bruegel.org](http://www.bruegel.org)

<sup>8</sup> Green paper on "A European Strategy for Sustainable, Competitive and Secure Energy", March 2006. Available at [http://ec.europa.eu/energy/green-paper-energy/index\\_en.htm](http://ec.europa.eu/energy/green-paper-energy/index_en.htm)

the proposals made by the Commission on the basis of the Green Paper,<sup>9</sup> the European Commission released on 19 September 2007 the so-called 'Third Liberalisation Package'<sup>10</sup> and on 23 January 2008 the so-called 'Climate Action' package.<sup>11</sup>

The Third Liberalisation Package aimed to further liberalise the energy sector in Europe and to increase the interconnection between EU energy markets in order to promote further market integration. The Climate Action package aimed to implement in Europe a comprehensive policy architecture to fight climate change.

The third package proposed the structural separation of the activities of transmission and generation (in the case of electricity) and supply (in the case of gas) in order to guarantee non-discriminatory access to networks. The package grants more powers to national regulators, increases cooperation between regulators and establishes coordination mechanisms for system operators.

The adoption of the third package would imply a step forward in the process of liberalisation by deepening the opening of markets at domestic level, by facilitating cross-border interconnection and by improving the conditions of access to networks. However, there does not seem to exist the political consensus to push it forward. The proposals of the Commission are not new but the momentum did not exist when the first and second liberalisation packages were adopted.

Does the momentum exist now? The main controversy around the third package is the network unbundling proposal. Eight countries (France and Germany amongst them) presented recently a 'third way' to proceed with the liberalisation process.<sup>12</sup> The so-called third way does not go beyond a proper implementation of the previous liberalisation package and excludes unbundling as a remedy.

The prospects of reaching a political agreement on this issue are poor. However, new policy developments have created new expectations for the progress of liberalisation: the German power company E.ON has recently proposed to commit to sell its electricity transmission system network to an operator which would have no interest in the electricity generation structural remedies to settle ongoing antitrust cases in the electricity sector.<sup>13</sup> The Commission has a number of ongoing cases in the energy sector that might result in new settlements contributing to the further opening of the energy sector despite the opposition of some governments.

On the climate change policy side, the European Commission has recently proposed a directive reforming the ETS after 2012<sup>14</sup> and a directive on the promotion of the use of energy from renewable sources.<sup>15</sup> The proposed reform of the ETS emphasises

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<sup>9</sup> See [http://www.consilium.europa.eu/ueDocs/cms\\_Data/docs/pressData/en/ec/93135.pdf](http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf)

<sup>10</sup> See [http://ec.europa.eu/energy/electricity/package\\_2007/index\\_en.htm](http://ec.europa.eu/energy/electricity/package_2007/index_en.htm)

<sup>11</sup> See [http://ec.europa.eu/energy/climate\\_actions/index\\_en.htm](http://ec.europa.eu/energy/climate_actions/index_en.htm)

<sup>12</sup> <http://www.euractiv.com/ndbtext/press/3rdoptionletter.pdf>

<sup>13</sup> See

<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/132&format=HTML&aged=0&language=EN&guiLanguage=en>

<sup>14</sup> [http://ec.europa.eu/environment/climat/climate\\_action.htm](http://ec.europa.eu/environment/climat/climate_action.htm)

<sup>15</sup> Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0019:FIN:EN:PDF>

its European character by replacing the national allocation plans by a European plan which reduces the distortions created by the existence of different allocation criteria. In addition, by increasing the share of permits that are auctioned, the efficiency of the allocation mechanism is improved. However, the mechanisms to promote the deployment of renewable energies continue to be mostly national in scope. The directive foresees a system of trade by which states can meet their targets by acquiring renewable certificates in other countries. Although trade in targets in theory favours efficient investment and guarantees the implementation of the least costly alternative, in practice, there are many restrictions to trade (eg trade is conditional on countries having met a share of their targets and trade should be authorised by the governments of the exporting and importing countries) which make the scheme not very flexible and do not guarantee an efficient outcome.

Technological progress and other market developments can affect the process of market integration. For example, increasing scarcity and world competition for resources may trigger the adoption of protectionist measures in order to guarantee domestic supply. The turn to nuclear may loosen the dependence on fossil fuels and then reduce the incentives for protectionism. Investment in LNG terminals may increase the entry gates for gas in Europe, increasing the number of suppliers and making the European gas market more liquid. Also, the decrease in the cost of renewable energy might make subsidies unnecessary and therefore might reduce the fragmentation of policies.

## **5. Conclusions**

The progress towards a common energy market is constrained by the physical characteristics of energy and by political and economic factors. The reliance of gas and electricity on a network and the difficulties of storing them create a tendency to market fragmentation. The technical complexity of operating networks and managing markets limits the expansion of markets. Also, the heterogeneity of market designs and the lack of coordination of system operators constitute obstacles to cross-border trade of energy.

In addition to the technical issues, there are also political and economic factors that prevent the integration of European energy markets. The protection of cheap domestic sources of energy, the promotion of national champions and of bilateral agreements in order to guarantee domestic supply and the national scope of some climate change policies contribute to the fragmentation of the European energy markets.

The adoption of the recently proposed Third Liberalisation Package would contribute to facilitating further market entry, cross-border interconnection and market integration. However, the political opposition by some governments to some of the crucial provisions of the proposal such as network unbundling might severely water down its ambitions. The climate change package also has implications for the common market for energy. While the reform of the ETS goes hand in hand with the removal of obstacles to the creation of a common energy market, the directive on renewable basically retains a national focus and, although it introduces some European instruments such as the possibility to trade targets, the way it is drafted does not seem sufficient to homogenise the different support mechanisms existing across Europe.

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Making further progress in the process of integration will increasingly imply dealing with the conflict between national interests and global efficiency. Market integration increases global efficiency but the distribution of the total benefits might not be even. This might create incentives by less-favoured states to free-ride. New policy developments should consider how to bypass national incentives to guarantee domestic energy supply, to protect access to domestic sources of energy and to protect national industry from the impact of stricter environmental regulation. More crucially, the effective fight against climate change requires common action in order to make an effective use of the complementarities across states. A single market for energy is the basis for a common approach to EU climate policy. A common climate policy will not deliver if markets are fragmented and prices do not converge.