

European Energy Markets Observatory

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In collaboration with



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A strategic overview of the European energy markets

Editorial by Colette Lewiner

Before writing this editorial, I read again the one I wrote last year. It is a valuable exercise. I found that many predictions we made at that time turned out to be right. Most of the trends that we identified then continued to materialize in the past year, but we were too optimistic on security of supply improvement and competitiveness growth in the retail market.

We believe that the most striking event in the last 12 months was the oil price volatility

In our previous report we concluded: *“This overall situation is not rosy, and it is clear that unless the worldwide economy will experience a downturn, the (energy) supply and demand balance will be more and more difficult to reach with conventional oil.”* and later *“oil spikes are not precluded in the following months.”* This analysis has been proved right. Crude oil price increased from \$70 per barrel in July 2007 to nearly \$150 in July 2008. It stayed in the range of \$90 to \$150 during the first half of 2008.

These high oil prices reflect all the tensions that have been detailed in our previous reports between high growth in global demand, especially from emerging countries, and fears that oil output growth would not match the speed of rising demand. The bottleneck in output growth comes from various technical and economic problems:

- Inflation in raw material costs and a lack of skilled personnel have pushed up the cost of production from existing fields,
- Mature fields are depleting,
- Costs of new exploration projects are escalating,
- Newly discovered large fields¹ are very difficult to exploit and it will take years before oil can be produced from them.

Based on these underlying difficulties, “surface” problems became more acute. Nationalistic attitudes from producing countries grew stronger, therefore raising geopolitical tensions. The US dollar continued to depreciate against all major currencies thereby decreasing the actual purchasing power each barrel of oil can exchange. There have been active speculations. All these factors pushed oil prices up.

Recently, oil prices started to drop. First of all, demand pressure is reducing a little bit. In June 2008, to curb oil demand, some emerging countries decided to lower their domestic subsidies on gasoline. Prices increased 29% in Indonesia, 16% in China and 10% in India. People in the US and other western countries also started to react to high energy prices and fears of economic recession, by lowering their consumption. For example, oil consumption in the US decreased by 3.8% in the first half of 2008. These developments led the International Energy Agency (IEA) to revise downward its world demand growth forecast².

On the supply side, Saudi Arabia increased its production by 500,000 barrels per day in May and June 2008. In addition, the US dollar strengthened, and speculation decreased. Oil prices dropped to less than \$70 in October, below its January 2008 level.

Central banks welcomed this oil price drop as it decreases inflation risks. In the context of the worsening credit crunch, central banks have to take quick decisions with two different objectives. On one side, they need to inject massive liquidities into the markets in order to avoid a total collapse of the financial system. On the other hand they have to control inflation

to avoid longer term damage to general economies. Lower oil prices can provide maneuvering space for bolder decisions.

However, this round of oil price drop could be short-lived. IEA lowered its forecast on non-OPEC production growth for 2008 to 270 thousand barrels per day, which is less than a third of the one million barrels per day growth predicted at the start of the year. In its September conference, OPEC decided to decrease its overall oil production by 520,000 b/d. In its October monthly report, OPEC foresees in 2007, a 890,000 b/d oil consumption decrease in OECD countries. For 2009, the global demand should grow by 760,000 b/d (compared to 600,000 b/d in 2008). Hence, the oil price level for the next few months is difficult to predict.

What conclusions can we draw for the future?

- Long term investments in exploration projects require stability in oil prices. Price volatility increases investment risks,
- A big drop in oil price will render expensive projects no longer financially viable. According to one of the IOCs³, \$90 per barrel is about the threshold below which production from the extra heavy oil sand in Canada would not give a satisfactory Return on Investment. At the same time, this heavy oil is needed for the future, and investment needs to start now,
- Even if economies of Western countries slow down or even go into recession, pushing down their oil consumption, it will not be enough to offset the steady consumption growth in the developing world,
- Technical difficulties to replace current oil production with new discoveries will remain,
- Unfortunately, there is little hope that geopolitical tensions between some oil and gas producing countries, notably

¹ Last year's biggest discovery was the Tupi field in Rio bay in Brazil, containing an estimate of 5 to 8 billion barrels of oil.

It is located more than 250 km off the coast. The oil is trapped around 7,000 meters below sea level; above it are 2,000 meters of water and up to 2,000 meters of hot high pressure volatile salt, among other factors.

² IEA forecast: In 2008 demand should reach 86.8 mb/d. It is 0.8% or 0.7 mb/d increase versus 2007, but it is 0.1 mb/d lower than previously estimated. Forecast for 2009 is 87.6 mb/d, which is 1.0% growth year on year and 0.14mb/d lower than previously estimated.

³ IOC : International Oil Company (or Major)

Russia and Iran, and the western import countries, will ease soon.

With a stronger US dollar and a foreseeable economic recession, oil prices should decrease on the short term. On the longer term, the tensions described above will remain pushing again the prices up.

Limited progress on the crucial question: “How to respond to European energy demand, while decreasing CO₂ emissions?”

Huge investments in energy infrastructures are needed

In order to comply with the forecasted energy demand growth and replace aging infrastructure, huge investments are needed. At 2% global economic growth rate, the world would need about \$22 trillion cumulative investments in energy (oil, gas and electricity) infrastructure between 2006 and 2030⁴, half of them in developing countries.

In the previous EEMO editions, we estimated that €1 trillion investment is needed in electricity and gas infrastructures in Europe. Our report cautioned that without a vigorous construction program, security of energy supply would be threatened. Since then, raw material cost growth and difficulties in finding qualified human resources have pushed investment amounts up and delayed commissioning dates of some much needed plants, electrical grids and pipelines. We will come back on these points later on.

Building these infrastructures on time is already a huge challenge. It is made more complex because of the need to curb CO₂ emissions in order to fight climate change. So, it is not just any investment, but of the right kind, that is required.

Are we on the right track?

On CO₂ emission limitation, the European Union (EU) is a front runner with the Emission Trading System (ETS—a “cap and trade” system for CO₂ emissions) implemented since 2006. Many measures are taken based on this system. In March 2007, the Member States agreed to a 20% reduction in CO₂ emissions by 2020, together with a 20% reduction in energy consumption and a 20% share of renewable energies in the total consumption, all compared with the actual levels of 2005.

In early 2008, the ETS was reformed. It now allows full emission certificates banking from Phase II (2008-2012) to Phase III (2013-2020). This change is in line with what we suggested in our previous EEMO edition. Also, during the first half of 2008, all EU Member States agreed with the European Commission (EC) on more restrictive Phase II (2008-2012) National Allocation Plans on CO₂ emissions. It totals 2,082 million tons of CO₂ per year compared to 2,298 Mt/year during Phase I (2005 to 2007). The combined effect of all these measures have pushed the CO₂ Emission Certificate price up from €0.05/ton at the end of 2007 to around €23/ton in September 2008. However, we need to point out that even as the CO₂ price soared, no real switches from coal to gas generation have been observed so far.

These measures are on the right track, but will probably not be sufficient to meet the 2020 objectives.

This is why the EC has proposed a “Climate Package” in January 2008. It is viewed as a priority for the French European Presidency in the second half of 2008. This “Climate Package” includes plans during phase III (2013-2020) that

will extend coverage from CO₂ to other greenhouse effect gases. It will impose very significant reductions of overall emissions, including from sectors that are currently out of the ETS scope. Also it will impose a big boost in renewable energy contribution to the total energy supply.

This package will also further reform ETS, by imposing the following changes:

- A phased reduction of the ETS cap on emission rights, from 2,082 Mt/y during Phase II (2008 to 2012) to 1,720 Mt/y by the end of Phase III (2013-2020),
- Starting from 2013, 100% of the Emission Rights will be auctioned to the power sector which currently gets most of them free of charge. This change will result in tens of billions of euros in extra cost for the Utilities which will certainly be passed onto the electricity prices. The auction revenue will be only partially reallocated on Climate Change related R&D projects,
- Over phase III, there will be much tighter control on emission certificates acquired through the Clean Development Mechanism⁵ or Joint Implementation mechanism⁶.

These “Climate Package” proposals have raised concerns and protests from certain industrial sectors as well as politicians. Oppositions argue that industries would outsource their production from Europe to countries with less stringent conditions, therefore resulting in job losses (“carbon leakage”). Moreover, certain Eastern European countries, notably Poland, are fighting against the plan on the basis that these measures would compromise their economic development.

No matter how, time will be very short to have this “Climate Package” adopted before the next European Parliament elections in June 2009.

⁴ International Energy Agency Nov 2007 report

⁵ The **Clean Development Mechanism (CDM)** is an arrangement under the Kyoto protocol allowing industrialized countries with a greenhouse gas reduction commitment (called Annex 1 countries) to invest in projects that reduce emissions in developing countries, thus acquiring emission rights.

⁶ The **Joint Implementation (JI)** mechanism is an arrangement under the Kyoto protocol allowing Annex 1 countries to earn emission reduction units from an emission-reduction project in another Annex 1 country.

Windfall profits: In many regional power markets in the European Union, the full price of ETS certificates is already reflected in the wholesale power market prices, despite the fact that many of these certificates are actually allocated to electricity generators free of charge. This is a clear windfall profit for those Utilities that are able to get free CO₂ certificates and charge them at full price to their customers.

The calculation of windfall profit depends on valuation methods and underlying assumptions, such as the percentage of free certificate allocation, ETS price, etc. For example, we estimate that the two biggest German Utilities, E.ON and RWE, had earned additional € 5 billion profits from free certificates in 2007 alone. Such huge profits have triggered taxation proposals from politicians in many European countries, notably in the UK and Belgium. These politicians are also alerted by increasing retail electricity prices, as household budgets are coming under more and more pressure from rising food, gasoline and home heating bills with an economic slowdown or even recession looming.

In Germany, the large electricity users' association VIK complained that German consumers paid €5 billion in 2005 for an actual nine million tons of CO₂ emission reduction in Germany, or about €550 per ton of CO₂ emission reduced, "the equivalent of €10/MWh [extra price] that companies are taking from customers without any service in return." The debate is far from closed. It will only come to an end if the "Climate Package" is adopted, in which clearly rules will be set on CO₂ emission rights auctioning during phase III (2013-2020).

Where are we standing now?

Despite the existing and future regulations, it is disappointing to see that Europe is not on the right trajectory to

meet its 2020 objectives. For example, CO₂ emissions in the EU were stable in 2007, whereas the objective was a decrease!

It is worse on a worldwide perspective⁷: CO₂ emission is expected to increase by 46% by 2030.

This worrying trend has to be reverted. Strong actions are needed to:

- Boost energy conservation,
- Develop sustained renewable energies,
- Make carbon capture and storage a reality,
- Sustain the current nuclear energy revival.

Energy conservation: In 2007, the EU countries had a mild average temperature in the summer and winter. However, electricity consumption continued to grow by 0.9% year-on-year, although this pace is slower than the previous years. Gas consumption decreased slightly by 1.6%. All forms of primary energy consumption in EU-25 decreased by a small 0.15%.

These figures show that for the first time in many years, the trend is reverting or at least energy demand growth has stopped. Barring the scenario of an abnormally cold winter, this tendency is likely to be confirmed in 2008 because energy demand decreases as a response to high prices and economic slowdown. Though we are on the right direction here, the target of 20% demand reduction is very ambitious.

We are in a critical situation but there are some reasons for hope:

- In the last year, some interesting actions were launched by politicians in various European countries. For example:
 - In August 2007, **German** ministers agreed on a 30-point program to reduce 35% of CO₂ emissions by 2020,

compared to the 1990 level. Energy demand and CO₂ reduction should come from cars, industries, public buildings and private homes,

- In **France**, a major debate took place around the "Grenelle de l'environnement" in October 2007. After this gathering, different measures are being adopted by the French Parliament to build insulation regulation and have incentives that switch towards less CO₂ emitting transportation means,
- The **Danish** government reached a broad parliamentary agreement in February 2008 to have 20% gross energy consumption reduction by 2011, compared to the 2006 level. The government will provide energy technologies R&D funding of one billion Denmark Kroner (€135 million) by 2010,
- In September 2008, the **UK** Prime Minister revealed a £1 billion (€1.26 billion) energy package funded by the "big 6" energy companies operating in the country. It is designed to help low income families make necessary renovations which will bring long term benefits by reducing energy consumption and therefore energy bills. Among the measures, insulation funding is a prominent one.
- Individuals are more and more sensitive to **sustainable development**. People are starting to change their behavior. For example, smaller hybrid cars and electrical cars are becoming increasingly popular,
- The same is true for **company executives** who now rank sustainable development among their top priorities. They should start taking actions⁸,
- **Innovative devices** are being developed and marketed to limit energy consumption and thus CO₂ emissions. For example, Light Emitting Diodes consume a fraction of the electricity used by equivalent incandescent lights,

⁷ International Energy Agency November 2007 report

⁸ <http://www.us.capgemini.com/PlattsStudy/>

- Some Utilities are launching **Demand Response programs**, incentivizing their customers to reduce their consumption. These programs, enabled by innovative devices such as smart meters, can save significant amounts of energy and CO₂ emissions⁹.

However, these positive signs are not enough. Tougher measures should be taken in developed countries in order to conserve energy. Also, more funds need to be allocated to fundamental and applied energy research such as solar energy, CO₂ capture and storage, second generation bio-fuel, fourth generation nuclear plants, etc.

Adapted measures, including energy efficiency improvements, need to be designed for developing countries, keeping in mind that their energy consumption and CO₂ emissions per capita are still very low and they want, rightfully, to reach better standards of living. They should take advantage of new technologies and innovation to limit their CO₂ emission growth.

Fighting climate change is a global challenge. If big CO₂ emitting countries such as the US, Russia, Japan, India and China don't curb their emissions, the EU efforts will be like a drop of water in the ocean, and at the same time jeopardize Europe's economic competitiveness.

Growth in renewable energies: The pace of investment into renewable and sustainable energy is increasing fast. Worldwide, it attracted \$112 billion investments¹⁰ in 2007. This is a 41% increase compared to 2006. Wind energy continues to be the industry's favorite, with 20 GW of new capacity installed in 2007. Solar technology continues to grow fast, albeit on a small scale. Estimates suggest a global investment of around \$20 billion during 2007.

In Europe, RES (Renewable Energy Sources), particularly wind, contributed to generation capacity increase by adding 8.3

GW in 2007. RES now represents 9% of European generation capacity.

Today, the cost of electricity generated by wind farms is much higher than that of many existing energy sources. In France, it is estimated to be twice as expensive as nuclear energy. Solar electricity has a significant higher cost than wind power. This is why the development of these two new forms of energy is strongly linked to financial incentives. Countries such as Spain, Denmark and Germany, with a large share of RES in their electrical generation capacity, have established long term regulations with incentives, for example, obliging Utilities to buy RES electricity at higher prices. In turn, the Utilities will pass this extra cost to their end customers.

While allocating seed money for innovative equipment is well understandable, subsidizing costly energies on a long term basis is questionable. It is not a sustainable business model because government policies could change. So, even if wind power continues to develop in the next few years, it is not obvious that it will be sustained in the long term. The case for solar energy is different.

Though today solar power is more costly than wind power, it has a much bigger potential for improvement, both in terms of energy efficiency with different photovoltaic cells matrices, and in terms of the manufacturing process and technologies. Both wind and solar energies are not schedulable; therefore pose many problems to grid operators both on grid development and on instantaneous balance of electricity supply and demand. Also, grid operators cannot rely on these "theoretical" installed capacities to provide electricity needed on peak load days. If there is no wind, there will be no electricity output.

Clean Coal technologies' first industrial steps: Carbon capture and storage is a

process by which carbon dioxide is separated at power plants, transported and then buried underground. It has long been seen by the energy industry as a means to make coal a climate-friendly fuel.

Many Utility companies have plans to build carbon capture technology enabled coal plants. In September 2008, Vattenfall fired up a 30 megawatts carbon capture plant in eastern Germany. It sees this €70 million project as an important milestone on the road towards widespread use of carbon capture and storage technology. Others, such as E.ON and Enel, have investment plans totaling hundreds of millions of euros for this technology.

However, the experience at British Petroleum has underscored the complexity of these projects. In May, BP abandoned plans for a plant in Australia after it discovered that geological problems made the long term storage of CO₂ unfeasible.

Today, CO₂ capture equipments installed at coal plants significantly decrease production efficiency, thereby roughly doubling electricity generation cost. CO₂ transportation and storage would increase the cost even more. More research work is needed on finding reliable CO₂ storage technologies. It is clear that only very high and sustained CO₂ emission prices could render these projects economically viable. In the meantime, Utility companies have plans to retrofit their coal fired plants which can increase efficiency up to 50%.

Nuclear revival: Having been out in the cold for many years, nuclear is now once again being embraced as an important energy source. There are 439 reactors in operation, 34 under construction and around 320 new nuclear projects planned all over the world. The IAEA¹¹ expects global nuclear power capacity in 2030 to range from a low-case scenario of 473 GW, 27% higher than today's 372 GW, to a high-case scenario of 748 GW.

There is an appetite for nuclear power in

⁹ Capgemini "Demand Response" study, in collaboration with VaasaETT and Enerdata, shows if these programs are implemented actively, they could achieve 25 to 50% of the EU's 2020 energy savings and CO₂ emission reductions targets.

¹⁰ Source: EFI and New Energy finance report

¹¹ IAEA: International Atomic Energy Agency

“old” nuclear countries as well as in new ones, in developed countries as well as in the developing world, in countries with experienced nuclear authorities and in those where they don’t yet exist, and finally, countries with savvy nuclear operators as well as those with non-experienced ones. There are prerequisites for this nuclear energy “renaissance” to sustain and turn into a success.

As with other large scale industrial projects, nuclear plants construction carries multidimensional risks related to technical difficulties, contractual and environmental concerns, regulatory complexity, skilled human resource scarcity and local communities’ opposition. All these factors can lead to construction delays and cost overruns that have to be borne by the various stakeholders including the end customers.

In addition, the nuclear industry has some unique and especially stringent requirements to comply with. Capabilities to meet these requirements are paramount prerequisites for the industry to succeed. The most important ones are¹²:

- Nuclear non proliferation control,
- Safety management over a nuclear plant’s entire lifetime, from design, construction, operation, radioactive waste treatment to decommissioning,
- Mastering the exceptionally long project lifetime and large investment: Lead construction time and plant operation lifetime combined is well in excess of half a century. €4 to 5 billion are needed for a 1,600 MW plant,
- Long term financial competitiveness based on stable environmental regulatory frameworks and sound business models,
- Smooth industrial ramp up in the face of this sudden and big revival, including revamping the entire supply chain as well as attracting competent human resources,
- Public acceptance is a specially sensitive and difficult point.

In existing nuclear countries as well as in “new” countries, governments, local authorities, financial institutions and mainly the whole value chain of the nuclear industry has to get organized quickly in order to make this nuclear renaissance a long standing success.

Security of supply

We have already pointed out that it is imperative to quickly invest significant amounts on energy infrastructures in Europe. In this respect, it is encouraging to see that since the low point in 2005, Utilities have started to invest again on infrastructures.

However their energy mix choices raise concerns. The majority (58%) of the planned generation plants in Europe will be fossil fuelled, dominantly gas fired, and thus CO₂ emitters. Moreover, investments on RES whose outputs are not schedulable do not contribute much to guarantee peak hour generation capacities.

These unfavorable energy mix choices, combined with long plant construction times, delays in plant commissioning and lower availability of the French nuclear plants due to maintenances, explain why despite increased investments, the overall electricity security of supply actually deteriorated in 2007.

Electricity security of supply deteriorated

Despite the mild weather, the real generating margins in the UCTE¹³ perimeter, taking into account non-usable and unavailable generation capacities, dropped from 7.6% in 2006 to 5.3% in 2007. Some worrying signs can be noticed:

- In France the real margin is at -5.7%. In the UK it is down from 7.9% to 2.2% compared with 2006. In Germany it is down from 4.4% to 2.0%,
- Central and Eastern European (CEE) countries have low margins: Hungary (-8.3%), Slovakia (-11.2%), Slovenia (-21.5%) and Latvia (-25.9%). CEE

countries struggled with supply shortages due to big plant maintenance in Bulgaria and Slovakia, as well as generation capacity drop.

Some countries kept their real generation margin high, such as Austria (+26.3%), Norway (+11.8%) and Lithuania (+17.1%).

We can notice that although theoretical generation margins increased, the real margins did not follow. This is partly due—as explained earlier—to the increased share of wind power in the installed capacity.

*This new deterioration of electricity security of supply, after improvements seen in 2006, reinforces our message on the need to speed up investments in infrastructures and to choose the **right** energy mix!*

Gas security of supply: Last year’s trends continued to materialize

In last year’s editorial, we wrote, “*One can easily predict that the EU/Russia battle for gas supply and value chain control is only starting.*” This is a hot issue as the share of Russian gas in total European gas supply should reach 50% in 2030, with varying dependency levels from one European country to another. Finland and many Eastern European countries will be more than 80% dependent.

As in the year before, this battle notably continues through the control of transportation and local pipelines:

- Russia successfully signed more partnership commitments to the South Stream pipeline project which was launched in 2006 between Gazprom and Eni (Italy),
- Gazprom recently agreed with Kazakhstan and Turkmenistan to construct a new pipeline along the Black Sea coast.

All these agreements are undermining the European sponsored Nabucco project, which could end up with not having enough gas to transport. In addition:

¹² Point of View « How to sustain the nuclear renaissance », by Colette Lewiner and Alva Qian, Capgemini

¹³ UCTE: Union for the Co-ordination of Transmission of Electricity

- Gazprom took joint control of local pipeline companies in Serbia and Belarus,
- Also Gazprom has increased its presence all along the value chain by strengthening its retail operations in many European countries, such as Germany, the UK, Italy and France.

While Gazprom is increasing its control on cross border pipelines, it seems that its grip on the Russian gas industry is weakening. Russian State regulators said that Gazprom would be fined for restricting an independent gas producer from accessing its vast pipeline network. In view of the same, will networks unbundling happen in Russia before Europe?

More worrying is the recent war in Georgia that is compromising the stability in the Caucasus region. Large populations of the Russian minority are living in countries like Georgia, Kazakhstan, Ukraine and Moldavia, and this unstable political situation is threatening gas security of supply because numerous oil and gas pipelines run across this sensitive region.

All these facts analyzed above reinforce our last year's message: *"Europe needs to decrease its dependence on Russian gas supply."*

To have better control over the situation and to improve its security of gas supply, Europe should take the following measures:

- Increase its gas storage capacities: In 2007, gas storage capacity in Europe increased by roughly 7% reaching almost 80 bcm. Over 59 bcm of additional storage capacity can be expected by 2015,
- Develop greater fluidity within the European market to enable more efficient pooling of resources among different countries in the event of supply crisis,
- Diversify supply sources by importing larger quantities of Liquefied Natural Gas (LNG), which currently accounts for

only 7% of European gas consumption. It is estimated that LNG could represent 15% to 18% of European gas supply by 2020.

We observed the same movement in the US and in Asia, where LNG demand is also growing to bridge the gap between gas demand and supply. This trend will lead to a tight LNG market in the 2015¹⁴ timeframe.

The LNG market is increasingly dominated by the LNG producers because there are now much less technical or have contractual obstacles to LNG cargo arbitrage between destinations. According to a study on LNG regasification terminals commissioned by the French Regulatory Authorities (CRE), the major challenge for Europe is how to attract LNG supply into terminals located in Europe rather than to those in US or Asia.¹⁵

Over the period, progress was made towards a common electricity market in Europe

In last year's editorial, we briefly analyzed the then freshly announced EC Third Package and especially the ownership unbundling proposal for electrical grids and gas pipelines. We concluded that *"unbundling alone is not enough (to create a truly liberalized energy market) and other measures would also need to be implemented to achieve that objective."*

In fact, the Third Package was not adopted. On June 17 (for electricity) and July 8, 2008 (for gas), the European Parliament voted on different texts in lieu of the EC's compromise. On October 10, 2008, the Energy Council reached formal agreement on this Package. Now, co-ordinations and reconciliations between the Parliament texts and the Commission text need to take place before the term of the present Parliament that ends Easter 2009.

The political wrangling over ownership unbundling did not prevent the energy

market actors (TSOs¹⁶ and Power Exchanges) from entering into agreements enabling progress towards a common market. This is reflected in the increased convergence between wholesale electricity prices in different European markets.

- Consolidation in the power exchange business is accelerating:
 - December 2007, Powernext (France) and EEX (Germany) signed a cooperation deal regarding their spot and futures trading operations,
 - March 2007, OMEL (Spain) and OMIP (Portugal) agreed to implement a single Iberian power market (OMI) by the end of 2007,
 - Belpex, Europe's first project of market coupling started two years ago. In June 2007, a memorandum of understanding was signed to extend the Belpex market coupling to Luxembourg and Germany in 2009.
- Some major new infrastructure were commissioned in 2007/2008:
 - The 580 km 700 MW NorNed subsea power cable linking Norway and the Netherlands went into full operation in May 2008,
 - The 350 MW Estlink HVDC submarine cable between Estonia and Finland is the first interconnection between the Baltic and the Nordic electricity markets,
 - A new line between Romania and Hungary should be completed soon.
- Some other projects have also been agreed upon or proposed in 2008:
 - The long awaited interconnection reinforcement between France and Spain,
 - TenneT (The Netherlands) and National Grid (UK) agreed to build BritNed link interconnector,
 - Italy and Albania decided to build a new interconnector,
 - A new 550 MW connection cable between Finland and Sweden (Fennoskan 2) and a 600 MW power cable between Denmark and Norway (new Skagerrak cable) have been submitted

¹⁴ 2015 corresponds to the commissioning of many planned LNG regasification infrastructures.

¹⁵ <http://gttm.cre.fr/>

¹⁶ TSO : Transmission System Operator

for government approval,

- In Ireland, the second interconnector to the UK has been approved,
- RTE (France) and National Grid (UK) have launched consultations for the construction of a second interconnection between the two countries.
- Three (E.ON, RWE and Vattenfall) out of the four German network operators are presently discussing to create a unique German transmission electrical grid unbundled from the incumbent Utilities,
- TSOs have significant investment plans: According to a recent UCTE study¹⁷, TSOs plan to invest €17 billion on their national grids and on interconnections in the next five years.

This demonstrates that even without the Third Package, the players are voluntarily pushing towards a liberalized fluid electricity market and they have plans to invest!

Changes in the Utilities landscape **Market consolidation**

Mergers and Acquisitions continued during the period. The long awaited Gaz de France/Suez and Enel/Endesa mergers were finalized. Both cases took almost two years to complete, during which the Utilities had to struggle with

governments' nationalistic attitudes, convince their own personnel and bow to EC requests for divestments.

These divested assets were acquired by other Utilities: Eni took Distrigas and Centrica took SPE, both in Belgium. To comply with the EU anti-trust legislation, Enel had to sell its assets in France, Italy and Poland to E.ON.

After this long and difficult gestation, GDF Suez emerged as one of the largest convergent (gas and electricity) players with big ambitions. It has announced a €30 billion investment plan over the next three years and is actively acquiring electricity and gas assets all over the world.

Most recently, EDF took over British Energy at £12.4 billion. It will give EDF almost all the UK's nuclear power stations and control over most of the best sites for building new nuclear plants, giving it a dominant position in the planned revival of the UK's nuclear industry.

We could expect other mergers and acquisition in the year to come, notably the Gas Natural/Unión Fenosa merger which is expected to be completed in the first half of 2009.

How will the market look like in the coming years?

Impact of the present financial and economic crisis

It is probably too early to evaluate the full extent and impact of the present financial and economic crisis. We believe that the Utility sector will surely be much more resilient than many others, but this does not mean that it is immune to the current turbulences.

Governments confronted with financial and economic crisis will have less tax revenues, and therefore will have to limit their spending, for example, by reducing financial subsidies to renewable energies. The Spanish government has started by limiting its incentives to solar development. As renewable energies need subsidies to be financially competitive, such decisions could jeopardize their growth, especially as far as wind power and solar energy are concerned.

Traded companies could suffer from significant stock price falls due to negative analyst assessments or credit rating downgrade. In the present hectic financial environment, sudden and large share price drops can quickly turn into a matter of survival. This is what happened with Constellation Energy, which, after experiencing a 70% share price drop in one day, concluded a purchase agreement with Warren Buffet owned MidAmerican Energy. The negotiated price was \$4.7 billion, less than half of what Florida Power and Light offered just two years ago. However, EDF that owns 9.5% of Constellation shares is preparing together with investment funds a counter offer.

More generally, this financial crisis should trigger more M&A activities (e.g. the announced Exelon/NGR Energy merger in the US). Companies with weak balance sheets (notably new entrants) will be especially vulnerable.

Longer term view

In a recent statement, GDF Suez's chairman split the current European power Utility sector into three categories:

- The very big players and ultimate consolidators, including EDF, GDF Suez and E.ON,
- The second tier, which includes Iberdrola, RWE and Enel. All three have the

¹⁷ UCTE Transmission Development Plan, edition 2008

necessary size to also become consolidators,

- The third tier is made up of a whole range of smaller Utilities that will need either to forge a partnership with one of the bigger players or will be consolidated.

Utilities have to accelerate their business model changes

In the past period, Utilities have benefited from high electricity prices and sometimes received big windfall profits linked to the CO₂ Emission Trading System. They have started to spend their war chest on internal or external investments.

In the near future, with a looming economic slowdown, pressures will mount on Utilities to reduce electricity prices. Customer associations will complain more and more on the electricity retail prices surge that is eroding purchasing power of household customers. Politicians could react by imposing price caps or taxes. Competition from existing rivals or new entrants will increase.

Utilities have to adapt to this new landscape by thriving towards operational excellence. This means that they will have to streamline their internal processes, simplify their organizations and increase their reactivity while continuously benchmarking their results with the “best in class.”

Some parts of the value chain are particularly urged to move fast. For example:

- The profitability of Utility retail, once unbundled from distribution, is usually quite low or in some cases even incurring losses. The “cost to serve” is high due to ineffective processes and high customer contact ratios. Our experiences indicate that to be competitive, the incumbent Utility retailer should drive down their cost to serve by 30-50%.
- Our recent Distribution Network Operators (DNO)¹⁸ Benchmark Study, shows big discrepancies among European DNOs on key performance indicators such as:

- Cost per customer,
- Average access time to connect a new customer,
- Time commitment for responding to supply failure,
- Average time for meter reading.

As analyzed in this benchmarking study, there are many reasons to explain these differences in performance levels. Nevertheless, there is often large room for improvement for Utilities to progress towards “best in class.”

And the customers?

The situation is not rosy for the customers:

Prices have continued to go up:

Electricity retail prices have skyrocketed in most European geographies since last winter, with year-on-year increases between 5 and 40%. Compared to 2006 levels, gas retail prices in all consuming segments have remained substantially stable in 2007 but have increased dramatically since the beginning of 2008, reflecting the delayed effect¹⁹ from the oil price surge. As oil prices declined in the second half of 2008, retail gas prices should also decrease in 2009.

Competition in newly deregulated countries did not significantly increase, while the footprint of large incumbents has steadily grown across Europe.

Innovation in energy retail markets is progressing slowly, focusing primarily on energy efficiency and billing schemes. And finally, as discussed earlier, **security of energy supply** has not improved.

In the future, customers should become more active players that are conscious of energy conservation and perhaps also become energy generators, thanks to solar photovoltaic technologies.

The relationship between Utilities and their customers would change radically. Utilities will become energy and CO₂ savings advisors and no longer thriving for constant sales increase. This would be a kind of revolution, triggering thorough changes in the Utility retail business,

calling for a new set of mission statements, objectives, organizations and IT systems.

Now, it is my pleasure to introduce the 10th edition of the European Energy Markets Observatory (EEMO), in which we continue to monitor the main indicators within the European electricity and gas markets.

For this edition, our partners continue to enrich our analysis by providing us with their sound expertise on regulations and legal questions at the European level (CMS Bureau Francis Lefebvre), on customer switch and behavior in electricity retail markets (VaasaETT) and on financial performances and strategies of the main Utility companies (Société Générale Equity Research).

Again, throughout the report, the main energy issues for key European markets (Belgium, Denmark, Eastern Europe, France, Germany, Italy, the Netherlands, Spain, Switzerland, Sweden and the UK) are embedded in various chapters.

I hope that you will enjoy reading this new edition of the European Energy Markets Observatory and that the information and analysis it provides will be useful for you.

Paris, October 20, 2008



Colette Lewiner

Global Leader of Energy,
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¹⁸ Capgemini European distribution benchmarking survey 2008.

¹⁹ There is usually a delay of six to nine months for oil price fluctuation to be reflected on gas prices, mainly due to long term gas supply contracts.

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VaasaETT is a highly innovative research and advisory agency, providing world leading customer psychometrics and related strategies through research and collaboration with the Global Energy Think Tank®. Unrivalled expertise of utility customer psychology and behaviour is applied to three core focus areas: Customer Value, Market Efficiency and Demand Response within liberalized and smart metering environments. VaasaETT is arguably the world's leading collector and analyst of global customer switching, churn, loyalty and elasticity trends in competitive (liberalized / deregulated) retail electricity and gas markets.

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