



Europe

# Energy Bulletin n°2

June 2006

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## Market news

### *Europe in general:*



#### European Commission (EC) future policy

An EC Green Paper is presently inviting comments on six specific priority areas:

- one European energy grid code, one European Energy Regulator
- security of supply
- a more sustainable, efficient and diverse energy mix
- global warming
- new generation of technologies and processes
- a common external energy policy (to speak with a single voice in discussions with e.g. Gazprom)

The 1<sup>st</sup> item should allow preventing weird things from happening as e.g. a gas ship was diverted from the UK to the continent during the winter while prices in the UK were hitting records...

#### Speculative traders setting in!!!

According to Financial News, Barclays and Société Générale among others are going to hire traders (40 for Barclays, number unknown for SG) for their commodities division, more precisely to “seize opportunities” arising in the European energy market. This is worrying as speculative trading tends to increase margins but also volatility and therefore risk premiums. Nevertheless, in a free market, it is impossible to prevent it.

#### Kyoto



On May the 15<sup>th</sup>, the EU countries had to report their progress towards their commitments under the Kyoto protocol (1<sup>st</sup> phase). The results were better than anticipated by the traders (see Market Price Information below) but the announcement was quite chaotic as a number of countries leaked information to the press before due date and as information on Germany's achievements was apparently difficult to interpret. Only 5 countries: UK, Eire,

Spain, Italy and Austria haven't met their commitments.

#### Nuclear Power

European leaders are reported to have recently debated fiercely over the future of nuclear power. Angela Merkel is against, Thierry Breton (French FM) and Tony Blair are in favour.

### *United Kingdom:*

#### New power plants

2000 MW electrical capacity has been recently added and 3300 MW have administrative consent and could be available to run at full capacity in 2010.

#### UK: National Grid publishes preliminary report on energy supplies

In its first preliminary report on energy supplies, National Grid highlights that gas supplies may be tighter next winter (2006-2007). In an Ofgem statement, it is further explained that less gas from the North Sea and uncertainty about whether the Rough Storage facility may be filled in time could see tighter gas supplies, especially at the start of next winter. There is a potential increase of supplies on last winter if the major new import projects are delivered on time and all facilities are used to import gas to Britain at full capacity when required. At the moment it has been confirmed that all projects are on schedule to deliver gas this winter.

## Germany:

### Transmission tariff decrease

The unbundling starts taking effects in Germany as a 12% tariff decrease has just been imposed to Vattenfall Transmission. Transmission tariffs in Germany are amongst the highest in Europe and similar decisions could affect other transmission operators. Vattenfall have said they will take legal action against the decision.

### New power plant

Steag plans to build a 750 MW power plant (coal-fired) in Herne.

### Centrica to enter the market

Centrica, with the opening of an office in Dusseldorf, is entering Germany's energy market. Industry reports claim that Centrica will initially concentrate on the supply of power to municipal utilities and business users, with the aim of marketing gas in due course.

## France:

### New power plants

→ EDF's Board of Directors has decided to launch the building of its first European Pressurised Reactor unit (EPR) on the Flamanville site in Normandy. The site already has two existing units. EDF stated that the commissioning of this EPR project 'is an essential step in renewing EDF's nuclear generation mix'. The estimated cost in 2005 terms is **€3.3 billion**, which equates to an estimated generation cost of **€46/MWh**. The completion of the 'Flamanville 3' nuclear plant is planned for 2012.



→ As expected EDF has announced that it will increase its "thermal" generation capacity but it will be achieved by retrofitting old power plants (that were held in medium-term stand-by, or in other words, in cocoons) rather than by building new power plants that would have a better efficiency.

### CRE

The French regulator CRE considers that the co-existence of two markets is unbearable. The price in the free market is now 30% to 35% higher than the regulated tariffs. In France, regulated tariffs are set by the government (not by the regulator) and before election periods, tariff increases are generally very limited. CRE hereby agrees with incumbents GDF and EDF lobbying strongly to abandon the regulated tariffs.

## Benelux:

### RWE Plans €1.5bn Power Plant

RWE CEO announced that the company plans to construct a combined hard-coal/biomass fired power plant in the Netherlands, with a gross output of 1,600 to 2,200 MW. The facility could come on stream in 2012.

### Distrigas



The European Commission sent a Statement of Objections to Distrigas (our gas supplier in Belgium) - part of the Suez Group - concerning the concerns that Distrigas is in practice preventing new suppliers from entering the Belgian gas market, which is in violation of EC Treaty rules on abuse of a dominant market position. A significant proportion of the Belgian gas market is unavailable for competition for long periods because Distrigas – the dominant gas supplier in Belgium – has concluded long term gas supply contracts with many of its industrial customers.

## Spain:

### Gas Market Continues to Grow

Spain has one of the fastest growing markets in the world (now ranked 6th in the EU according to figures published by Asociación Española del Gas). Spanish natural gas demand increased by nearly 20% last year. Practically, all of Spain's requirements are imported with approximately two thirds coming from Liquefied Natural Gas (LNG). The power generation sector witnessed the largest increase as demand rose by 68%.

Practically all of the gas consumed by the electricity sector was in plants commissioned in 2002. Gas-fired generation now accounts for roughly a fifth of electricity generation.

### In brief...

→ Electricity spot prices in Spain crashed early in June, following Iberdrola ordering its distribution business not to pay more than the artificially low price (€42.35/MWh) set by the Spanish government. This was intended as a form of protest to the new regulations and had exactly the effect intended as the system operator had to step in and call on premium priced backup plant to generate **in order to avoid blackouts**.

→ A common Iberian (Spain and Portugal) electricity spot market is due to start in quarter 3 of 2006. Its name is MIBEL.

→ Endesa plans to build a 800 MW power plant (combined cycled) in Catalonia but will close two current oil-fired units (for ~600MW).

## Scandinavia

### Nordpool

Torger Lien, CEO of Nordpool (the Scandinavian power exchange), told Financial Times he is expecting a concentration within the energy branch in Europe, as economies of scale are more pronounced in this sector than in others.

### Denmark: European Commission approves DONG acquisitions

The European Commission has announced its approval, subject to conditions, of Danish state-owned gas incumbent DONG's acquisition of sole control of Elsam and Energi E2 (E2), Denmark's regional electricity generation incumbents, and of Københavns Energi Holding A/S (KE) and Frederiksberg Elnet A/S (FE), Danish electricity suppliers.

## Russia

### Gazprom

Gas giant Gazprom has now become the **3<sup>rd</sup> largest market value in the world** after Exxon and General Electric...



## Mergers

### GDF-Suez or ENEL-Suez?

Enel renewed €50 Billion bank financing to expand (e.g. by taking Suez over).

### E.on-Endesa

EU calls on Spain to revoke anti-e.on decree; authorizes e.on take-over of Endesa.

### Union Fenosa?

Construction company ASC seems interested in Union Fenosa (3<sup>rd</sup> largest utility in Spain).

## General information about the market mechanisms

### *What are the so-called delivered electricity price and the locked electricity price?*

In the last Energy Bulletin, we have seen the definitions of (1) the forward market prices, (2) the spot market prices and of (3) the power exchanges. In this bulletin, let's see the definitions of the delivered electricity prices and of the locked electricity prices.

The **delivered electricity price** over a period (and for one particular site) is the total electricity spend (related to this period and this site), divided by the total electricity consumption over the same period. Generally, one can split this delivered electricity price into:

- the **commodity price**, i.e. the price paid for the active energy
- the transmission & distribution prices (these are usually not negotiable)
- the taxes and levies (e.g. green or Kyoto taxes...)

but this is not always possible as some suppliers (mainly in regulated countries) use an all-in price.

It is important to note that the **commodity price is NOT equal to the locked price**. One defines the locked price as the value of the corresponding market index (for baseload and commodity only) when the decision to purchase is taken. They are different because:

- the actual consumption profile of the site is not a perfect baseload (e.g. some sites stop during the WE, some cause big instantaneous peaks...)
- the supplier includes a management fee (his margin) in the rates
- and because of the contract structure, for example if one locks the price for one year, usually the supplier splits this price into several rates (e.g. winter/summer, peak hours, off-peak hours...), hence the commodity price will vary over time while the locked price is constant...

**Obviously, the goal of Amcor is to lock the price when the market index is the lowest.**

When there is no market index coinciding with the considered period, the most representative market index is used. For example if we want to buy electricity in Germany for one year starting in March 07, we will probably use the index called "EEX Cal 07" as a reference (EEX being the German power exchange).

### ***What is a contract with a flexible pricing mechanism?***

In a number of countries, we use the so-called flexible pricing mechanisms. Such mechanisms allow Amcor to lock (fix) the price of energy progressively rather than fixing it for the full volume and for the full contract duration. Depending on the exact mechanism used, Amcor can e.g.:

- lock the price of one particular month or quarter in the future
- lock just a 'tranche' (chunk) of the volume needed, e.g. 25% of the future needs
- or a combination of the abovementioned

Typically, such mechanisms are reserved for companies consuming more than 30000 to 40000 MWh a year. Individual sites of Amcor are generally too small to enter such a contract on their own but by pooling volumes Amcor gets access to them.

In terms of risk management, one might think that this is risky (especially vs. the budgets)... well on the other hand we are sure not to lock 100% of our needs at a bad time. This type of procurement is actually more in line with what we are used do for raw material. And important advantages (when buying short ahead) are that:

- such mechanisms allow us to avoid the risk premiums asked by the suppliers for a delivery ahead in the future (typically 5 £/MWh for next Winter in the UK)
- when we wait closer to one particular month, we generally have more reliable information to select the best time to buy

Disadvantages:

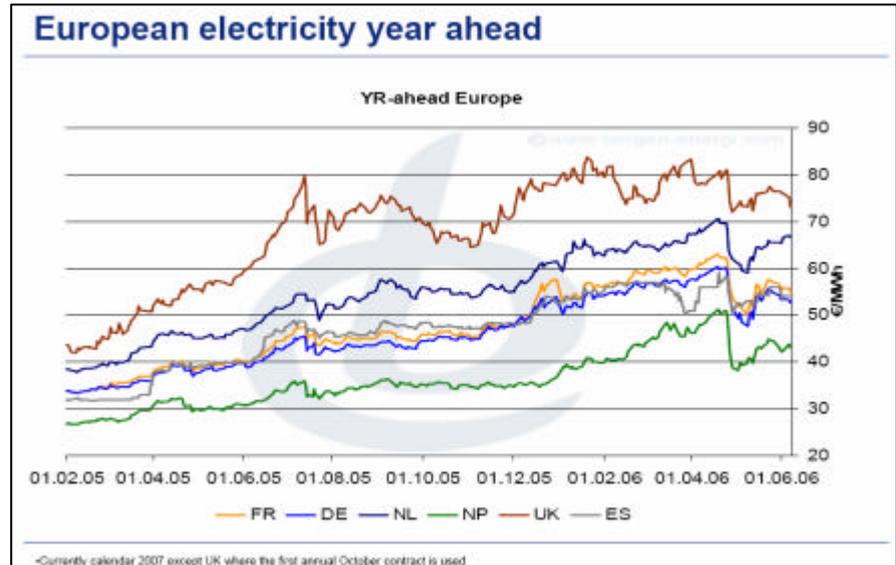
- Less visibility vs. the budget
- More work
- Amcor must cope with the volatility

In the UK, Amcor was actually amongst the first companies to use it for electricity.



## Market price information

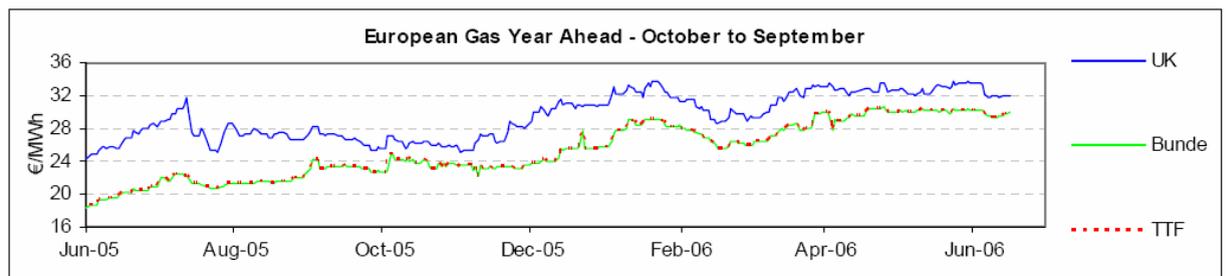
### Electricity:



Note : the prices above are for baseload (i.e. for a flat supply) and for commodity only. **These are forward prices.** For an explanation about forward prices, see Energy Bulletin n°1.

From Jan to April 2006, all the electricity prices increased a lot, mainly on the back of oil and CO2 allowances. In May, all the prices went down because of a mini-crash of the CO2 market (see more information below). In June, more versatile trends were observed because of local fundamentals like power plant outages and ambient temperature.

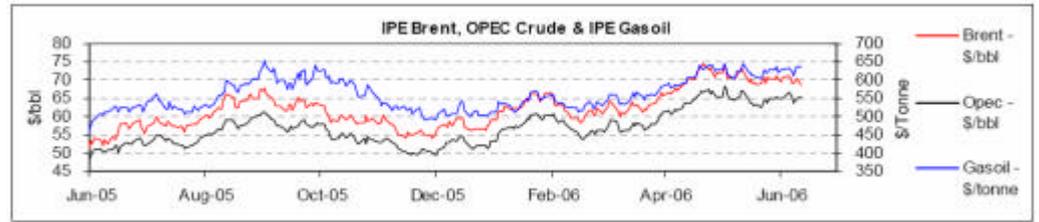
### Gas:



Note : the prices above are for commodity only. **These are forward prices.** For an explanation about forward prices, see Energy Bulletin n°1.

The evolution of the gas prices is usually similar to electricity (as the gas price is one of the drivers for the electricity price), but the mini-crash of the CO2 market modified this for once. Demand for gas was expected to decrease (indeed, with a "low" CO2 price, electricity producers can burn "darker" fuels like coal instead of gas) but the gas price barely decreased on the back of the oil price and relatively bad weather in May.

## Oil:

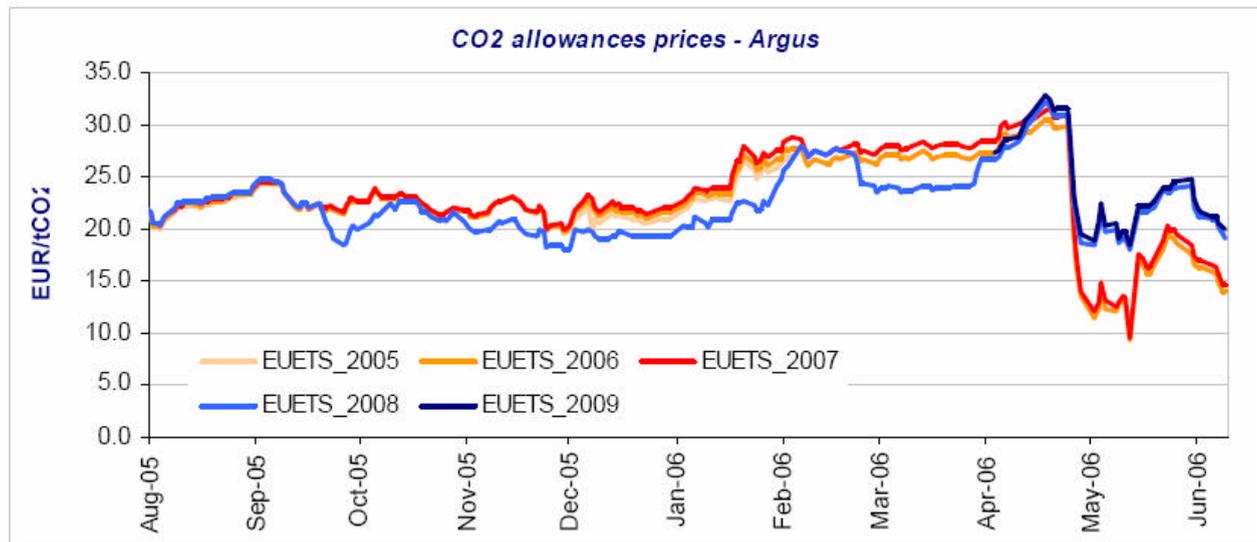


The oil price has increased a lot over the last months, back to its record levels, among others because of the difficult geopolitical situation in the Middle East. Nevertheless, it is now expected that the prices will decrease a bit as refining capacity in the US is improving, even if an active hurricane season expected. Of course, if Iran and US don't find a diplomatic solution to the nuclear crisis, prices will be bullish again.

Note for the future: a dozen new oil finds are reported in non-OPEC territories, eg :

- Canada (mostly light oil): Eagle Rock (Antelope Lake), Endev (Majorville), Magnus Energy
- US Gulf of Mexico and Texas: Petsec, Total, Amadeus (Hallettsville)
- Australia, Timor Sea: Coogee (Swallow), AED (Puffin 9)
- India: Cairn (Rajahstan), Reliance (KG: Krishna Godavari)
- Africa: BP/Total (Angola: Urano); Viet Nam: Vietsoupetro; China: ROC Oil (Bei Bu)
- CNOOC announces high oil & gas production target: + 10Mt/yr by 2010, 50 new fields being developed

## CO2 allowances (Kyoto protocol):



Reminder: CO2 allowances (which are tradable rights to emit CO2) have a direct impact on the energy price as electricity producers must buy such allowances to produce more electricity. Moreover, it prompts them to run with gas power plants that emit less CO2 than coal fired power plants, which in turn increases the gas price.

All CO2 actors were waiting anxiously for mid May when the balance "actually saved CO2 vs. target" had to be assessed exactly for the 1st time. Most actors bet that the targets had been missed but on the 26<sup>th</sup> of April, the price of CO2 decreased by 30% as some countries leaked to the press the fact that their results were better than expected. The decrease continued with the official results as nearly all the European countries had finally met their commitments made under the Kyoto protocol. After hitting a low of 8 €/ton CO2, the 2008 forward price re-increased because the drop had been abnormally important (it seems a lot of traders have misinterpreted the CO2 results of Germany).

## Market Price forecasts:

In December 06, all the Financial Controllers will receive market price forecasts (and delivered price forecasts) for their country for the budget exercise. These forecasts will be based partly on forward prices and partly on scenarios with different assumptions about oil demand, infrastructure availability, weather...

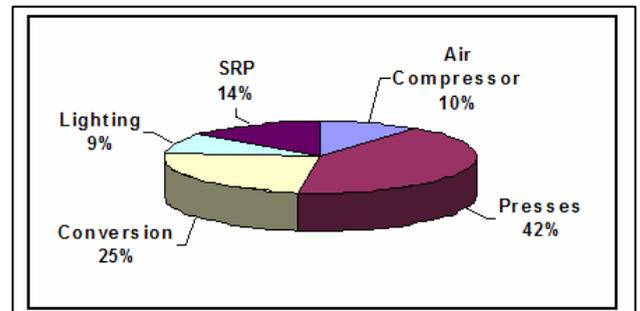
## Best Practices

### SEC:



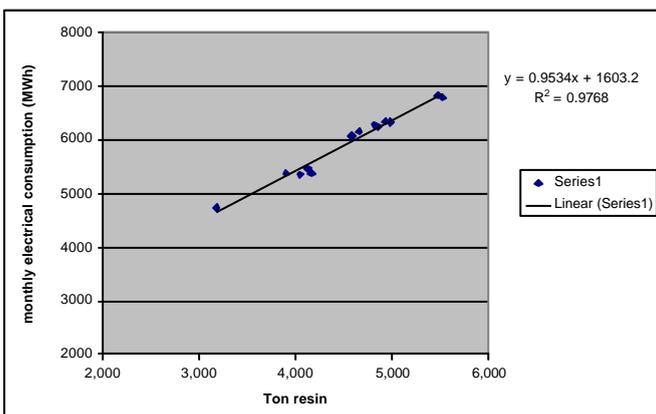
**KNOW  
THY  
ENERGY!**

Ask our colleagues in the UK and they will tell it to you. The first step towards energy efficiency is to know more about your energy usage. To that end, two key actions must be undertaken at site level: (1) producing a breakdown like the one below (for electricity in this example), which is necessary to have a good basis for energy efficiency investments.



To produce such a breakdown, one can make some calculations using the installed capacities and consumption pattern but it is better to use metering devices, especially if the consumption pattern is complex. Portable metering devices are available at 2500 € (for electricity) but if you think long term for your site, installed submetering is better, submeters cost typically 750 € for electricity and 1000 to 1500 € for gas. Next to energy savings, such submeters will have indirect positive side effects for your site:

- early detection of abnormal energy consumption patterns (one of our German sites detected herewith an oil leak that wasn't directly visible) &
- better understanding of the production and its impact on energy usage



(2) the marginal specific electrical consumption (MSEC) and base consumption of your site must also be calculated. The MSEC is the marginal amount of electricity needed to produce each extra m<sup>2</sup> of film or kg of processed resin. This indicator is very important to assess your own performance and it is also very important for pricing purposes as energy costs will be more and more passed through to customers in the future. It can be calculated based on linear regressions between monthly usage and monthly production (but reconciliation with theoretical calculations and submetering is recommended). On the left hand side, you find a fictitious example for an extrusion plant. The so-called base consumption is the intercept between the linear regression and the Y-axis.

#### Remarks:

- The MSEC is not a perfect indicator. Usage also depends on product mix, ambient temperature... **but that's not a good reason not to use it.** For a few special sites, little corrections will have to be considered if there is no reasonable correlation between consumption and production (in this case, one can define an alternative indicator called average specific energy consumption).
- Each site could come up with different MSEC definitions (e.g. in MWh per m<sup>2</sup> in the UK and in GJ per ton solvent in Gent...). That's not a problem, the main goal is to improve your site. Comparisons between the sites will be considered in the long term, not to pinpoint sites with a higher MSEC but to help them to improve further. Inbetween, if you haven't produced such indicators yet, we recommend to work in kWh/m<sup>2</sup> for the conversion sites, in kWh per kg resin for the extrusion sites and in kWh per blown m<sup>3</sup> for the blowing sites (APET).
- The base consumption is also an important indicator. Air leakage for example will have a direct impact on it. Any savings target should also bear on this indicator.
- Note that for gas, similar indicators could be defined but they are less important as APET uses very little gas and for AFE, there is rarely a linear regression to be found (e.g. the RTO's can consume less when there is more production). Of course, the gas consumption still has to be borne in mind.

### **Compressors and compressed air network:**

The last Energy Bulletin triggered a lot of positive reactions regarding the article about compressors, thanks for that. Following these reactions, here are a few more things worth mentioning:

- To lower the compressors room temperature, one can bring fresh air to it by using registers but it is even better to recover the heat by ducting it to another area where it is useful...
- Match your needs but don't overkill! Don't use 10 bar pressure if 9 bar is enough (sometimes, one doesn't know exactly what is enough, in this case try to decrease the pressure progressively). This item is a recurrent item in the audits of our Australian colleagues. In the same token, you can even use separate networks (each at the right pressure), APET is in the process of doing this with important savings...
- Important, isolate the machines (i.e. close the compressed air infeeds you don't need) when you stop them for maintenance or product change.
- Don't use compressed air as a driver. For example, some small pumps on the market are to be driven by compressed air (expanded in a turbine) rather than by a small dedicated motor. In most cases, this is very inefficient!

And remember, a leak detector set is quickly paid back...

### **Important target:**

In the near future, most of the European sites will receive an energy policy setting a target of 10% improvement of their MSEC and base consumption over the next five years. In the coming months, 3 sites will be used as pilots in order to centralize and roll-out the results of these audits.