Paris Energy Club

October 6, 2010

A summary of remarks

Session 1 – Non conventional gas

This subject was already discussed on the previous days in the 15th Gas and Electricity Summit. The very large development of non conventional gas production is a miracle. Nobody expected this development ten years ago.
Today, non conventional gases are mainly tight gas, then CBM (Coal Bed Methane), then shale gas. Shale gas production is 65 Bcm in 2010, should reach 130 Bcm in 2020. Total non conventional gas production in the US should represent 64% of the US production in 2020.

Several factors explain the very large development of non-conventional gas in the US:

- Geology
- Non conventional gas are onshore, "easy to develop"
- Large and dense infrastructures available
- Big number of diversified service companies
- Creative companies
- Incentives for individuals (the owner of a land owns the sub-soil and can rent it for gas exploitation)
- Prices are favorable. There is a strong link between the number of wells drilled and the price of gas. Many companies have hedged their production at a time when the price of gas was high. The decline in prices could affect the development of non conventional gases but overall people remain optimistic.

Costs aspects are also favorable. In the US 400 Tcf can be exploited for less than $3/MMBTU. The development of non conventional gas is also the combination of high rate of returns (quick production) and tax reduction.

Other countries have also a fair potential for the development of non-conventional gas: Canada, Australia (CBM), China (Shale gas). However it will take time to develop them. This development will be extremely dependent on the development of service companies to ensure exploration and production. Drilling and fracturation technologies are available in US, not in Europe. A power of 3000 HP is necessary to drill a well. There is no expertise for the moment in Europe and it takes 5 years to develop a competent frac operator. The quality of services will be extraordinary important in Europe. Another problem: dealing with noise will be more difficult than in the US because of the density of population.

The development of non conventional gases had/has a large impact on the market. Non conventional gases are competitors to LNG but also a source of LNG.

Definitely, non conventional gases can be a chance for China. China is consuming large and increasing quantities of energy. Recently China became a coal importer. China was in 2009 the first gas consumer in Asia (before Japan) and is importing gas from Central Asia at a very high cost.
Some participants stress than in the present situation (low prices), importing LNG is probably a better solution than importing pipe gas from Central Asia.

The forecast imports of gas are very large. So, non conventional gases are an opportunity to develop the production of low cost and "clean" electricity. However the government could be slow in delivering the authorizations required for the development of non-conventional gases. Only State Owned Companies have access to the land.

There is no standard definition of non-conventional gas since "not all shale gases – for instance – are equal, even in one basin or reservoir". For shale gases, there are very different grain size and matrix composition. Depletion rates for shale gas are usually very high but variable: in one year, the production of one well could decrease from 10 MMSCF/D to 2!. However in another production area (Barnett), after 5 years some fields are still delivering 20% of the initial production.
The question of production decline is of course fundamental. Many organizations have data.

Land ownership or lease is key in the development of non conventional gases. The question of price is also an important one. Even if a cost as low as $3/MMBTU has been mentioned, equilibrium price should be more 5-6 to 7-8 $/MMBTU. But 5-6 or 7-8 makes a big difference!

Environmental impacts are numerous:

- Impact of the chemical components of the "fracturation fluids" – frac fluids. The quality of these components has been improved
- There is a risk of pollution of "wrong" zones (zone which should be protected) : this depends on the quality of operations. There is an evolution of the legislation. Special care must be given to shallow gases.

However there is – apparently – no record of important pollution due to water/chemicals use for the fracturation.

Improvements in the exploitation are linked to monitoring of the frac in real time and recycling of water (which can be reused). Environmental aspects have been largely discussed – as well as the issue of water availability (China?). However there was no significant case of pollution despite the number of wells already drilled in the US.

The development of non conventions gas production started in the US and was initiated by small companies. The large companies (IOC) were absent at the beginning. So new partnerships between IOC and smaller companies are developing.

The impact on the production of non conventional gas on the gas market is very important. Instead of being a large (LNG) importer today, as expected 5 years ago, the US could become a – small – exporting country. However this does not mean the death of LNG. Clearly the situation of LNG is difficult especially in the Atlantic basin dues to the very low spot price at Henry Hub for instance. But, if we take Qatar as an example the present low price for gas can be compensated by the sales of liquids. Condensate ensures the profitability of the Qatar LNG project.

Gas prices are low today because of the reduction in the demand in 2009, of the development of non conventional gas production, of the start up of the large LNG projects in Qatar. This is good news for the production of electricity from gas which gets an advantage over the production of electricity from nuclear or from renewable – and even from coal. The development of non conventional gas has improved the security of supply… and is good for fighting climate change. Some ecologists are strongly against non conventional gas, not so much because of the risks associated with drilling and production but because gas, which is the cleanest fuel among fossil fuels and was considered to be a "transition" fuel could become… a destination fuel, due to the very large reserves of non conventional gas.

However we should also think of an alternative scenario, less optimistic, taking into account the fact

that the development of the gas demand has simply been postponed by 2 years, and the potential production anticipated by 2 years.
So are non conventional gas really a game changer?

Afternoon

Session 2 – Current issues – The oil spill in the Gulf of Mexico (Macondo)

The accident is the result of a mix of technical and human failures. BP feels "responsible but not guilty". The Transocean drilling platform was well rated in terms of safety. The main reasons of the accident were probably first the cementing issues. Negative pressure tests were accepted by the staff. The well control response failed. Fire burst out. The BOP did not seal the well. It could not be activated from the platform.

The actions taken by BP after the accident were presented as appropriate. There was a massive and rapid reaction. Important changes took place within BP. BP worked closely with the European Commission in order to avoid overreaction from the authorities.

The impact on the industry was very large. The companies showed their solidarity to BP. Several companies created a Club to discuss these issues. The internal processes for drilling are different from one company to another one: the design of the well, the cementation, the casing is different.
The industry reaction was very quick. A lot of initiatives (API, OGP…) were taken. All the safety procedures were reviewed. Three areas of improvement were identified: well design, containment, oil spill response.

The consequences of the accident are important, on the BP share value for instance, but neither the price of oil, nor the values of the other IOC shares were affected. The situation is more difficult for the smaller companies and there will be a redistribution of cards. Risk cannot be avoided. It is recalled that BP is more exposed to accidents because 80% of the production comes from deep offshore vs 30% for Exxon.

This accident is particularly important for the IOCs which have a proportionally very large deep offshore production. IOC will get up to 15 % of their production from offshore between 2010 and 2020 and this proportion will increase. So many task forces have been internally created to deal with the problem.
There was a strong pressure of the Green Parties in the European Parliament to slow offshore exploration in Europe. Regulators in many countries request much stricter regulations.

There is a moratorium on offshore operations up to 30th of November (this moratorium has been lifted in October). It is vital for small companies to resume their job.
New regulations. new liabilities will make it more difficult or even impossible for small companies to continue operations.
However the oil offshore activities in the Gulf of Mexico are so important that it is impossible to set up too strict limitations.

There is a new focus on HSE regulations. It is difficult to find insurance companies ready to cover the risk. This will have an impact on the projects, duration, delays with consequences on costs and then prices. New relations will develop between operators and service companies, between operators and associates.

Clearly more stringent regulations will apply in the US. They will spread to Europe, Latin America and probably to the Gulf of Guinea? However general regulations which would apply all over the

world would not be a good solution

An impact of the accident should not be underestimated: there is a reduction of production in the US, at the time when the US is looking to energy independence. So more coal, more ethanol will be produced in the US which is not good news for the environment.

The consequences in terms of costs for the industry are large: increased costs (a platform like Deep Horizon is rent for $500 000/day and the cost of the platform is 500 millions. One consequence of the accident could be to make necessary to have 2 platforms (one in operation, another one waiting in case of accident).

Session3
Oil prices – Geopolitics - Environment

Oil prices : There are short term oscillations but much less volatility than a few years ago. There is a relatively narrow trading range of $65-$85/bbl since autumn 2009. The prompt market is weak but the non-OECD demand is buoyant. There is a convergence between economic expectation and price. However the perception of 'inevitable' future supply scarcity has not disappeared.
OPEC spare capacity, at 6 Mb/d, is now highest since 2002. OECD inventory represents 61.4 days of forward demand which is very high. The demand growth is expected to slow from 1.9 Mb/d (2010) to 1.3 Mb/d (2011) and to be met largely from outside OPEC. Any sustained move above 29 Mb/d in call on OPEC will not occur before 2H 2011 at the earliest
Some uncertainties remain for the future demand growth: are efficiency gains structurally embedded to ensure an 'oil-less' OECD recovery? Will data visibility for the non-OECD markets improve and will commitments to phase out price subsidies be fulfilled?
Regarding supply the main questions are: will the Macondo oil spill herald higher costs and stretching lead times or will supplies remain easier for longer? How will geopolitical risks (Iran) evolve?
Anyway, greater transparency in physical and financial markets could help sustain recent price stability; but how to make physical markets more price elastic, which would minimize LT volatility?

Geopolitics – China. China is now the 2nd largest economy (2009 GDP at $5 trillion ~ Japan's $5.07 trillion), largest energy consumer (?) - BP data: 2009 TPES at 2177 Mtoe ~ US level of 2205 Mtoe; IEA data: 2009 TPES at 2265 Mtoe vs 2169 Mtoe for US. China is also the 2nd largest oil importer (2009 at 215 Mt more than Japan's 197 Mt)
China has the largest population, is the largest emitter of local pollutants, is the largest CO2 emitter, is the largest consumer of main metals, has the largest foreign exchange reserve ($ 2.4 trillion).
There are similarities but differences between China and Japan.
The economic indicators are very different depending upon each region in China. The Eastern region – where production concentrates – is no more competitive vs. a vs. other Asian countries or other Chinese.

The proportion of some products manufactured in China is impressive:

	China Production	% of World Production	% for Export
Mobile Phone	480 m	50%	80%
Motorcycle	21 m	50%	50%
TV	88 m	45%	55%
PC	120 m	40%	75%
Shoes	11 bn pairs	55%	70%

This is of course the reason why China is securing – or trying to secure – sources of energy and minerals all over the world.

The energy demand will probably not peak before 2030. The supply cannot run behind demand So, how to control demand? There is a strong desire of electric vehicles: 100 millions e-motorbikes are in use. There are also ambitious objectives in term of electric cars.
Regarding gasoline, despite CAFE standards already better than in the US. the potential demand is huge and the requirements could increase from 90 Mt/y now to 450 Mt in 2020. The Chinese gasoline production will have difficulties in following the demand. However for the moment some exports of gasoline are observed and there are increasing.
China is also a leading investor in renewable energies.
Some very important questions:

1. Is foreign investment climate getting worse?
2. Should China pursue low carbon economy or low emission economy?
3. Chinese role in energy geopolitics

CTL is only part of a big agenda. A number of projects exist but their cost is very high. One CTL liquefaction plant works. SASOL continues with FT technology but the project is not approved
It is envisaged to produce different liquids from coal (not only oil products).

Geopolitics - Russia and CIS: Russia and the CIS will remain the most important hydrocarbons exporters in the next years.
The economic feasibility of Turkmenistan exports to China is discussed. With the present low price of gas, the best solution to supply China is to send LNG to Shanghai. But if Turkmenistan gas can be exported to Europe through South Stream, the price of Turkmenistan gas can become lower and the best solution to supply China can become … Turkmen gas.

South Stream will probably develop. The future of Nabucco is bleak except if we accept a limited size.

Environmental issues
Cancun Challenges

- Necessity of better measures of carbon emissions and reduction
- Necessity to make money available from reductions of emissions (CDM…)
- Fund will take a step forward

What is the future of ETS in Europe? There probably will not be any global ETS. Can new countries join the European system?

The question of CCS is key. CCS could represent 19 % in reduction of CO2 (if we go to Factor 2) nuclear 6, renewable 18. The Cap and Trade system is losing appeal. What is the alternative? Carbon tax? The climate change debate is viewed in the ME as petro phobia.

The next Club meetings will be:

- On Friday April 8, 2011 (the12th International Oil Summit will be on Wednesday April 6)
- On Wednesday October 26, 2011 (which will be before the 16th International Gas and Electricity Summit which will be on October 27 and 28)