Panorama: World Energy in 2005 Analysis and Impacts

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It is my pleasure to present the annual IFP overview of the past year. In my opinion, 2005 will be remembered as a year marked by:

- The end of cheap oil as well as the end of surplus capacity in production, refining and along the entire chain of oil supply.

- Tensions and fluctuations on the gas markets.

- A strong revival of government concern over energy policy, which is somewhat reminiscent of 1973 and 1979 and the oil shocks.

From the standpoint of oil, 2005 definitely marked the end of cheap oil because prices continued to climb. The Brent price started at $40 a barrel and reached $55-60 a barrel at year-end, peaking in September at $70 dollars after Hurricane Katrina. For many market watchers, the persistence of an uptrend that started in 2002 and the fact that prices stayed high without a major impact on demand mean the end of oil. We think differently. In our opinion, we are seeing the end of cheap oil, but not the end of oil.

The oil shocks in the 1970s created excess capacity all along the production and supply chain, in other words, in:

- Oil production (up to 10 million bpd in OPEC countries)
- Shipping (with very large crude carriers left to rust in Norwegian fiords)
- Refining (a crisis situation with zero or negative refining margins)
- Logistics (oil services).

Today, all of this excess capacity has disappeared. No longer is there any surplus capacity available for crude production or refining. The entire oil chain is operating on a just-in-time basis. On the oil market, there is a new paradigm. In my opinion, this paradigm is the end of "cheap oil", with a tight market that is here to stay. That the geopolitical situation is relatively tense – to use a euphemism – encourages a climate of uncertainty conducive to speculation.

In the third quarter of 2004, oil demand accelerated sharply. This reduced OPEC's available surplus capacity, which has been in the range of 1.1 to 2 million bpd since mid 2004 and which, despite the fact that oil demand slowed in 2005 to levels consistent with past figures, stayed below 2% of world consumption (compared to pre-2002 figures for world consumption in the neighborhood of 5 to 7%). This loss of flexibility makes the market prone to react to any decrease or threat of a decrease, even very small, in world production.

In addition to a tight situation with respect to available excess OPEC capacity, there were tensions in the refining sector. Last year, I stressed that there existed a shortage of refinery capacity due to a

lack of adequate investment following thirty years of low margins. World refining capacity was also in short supply. In major consuming zones like North America or the Asia/Pacific region, capacity was totally insufficient. In addition to a problem of quantity, there is one of quality: the refining infrastructure available does not adequately cover demand for higher-grade products. The sharp increase in world demand for motor fuels and, generally speaking, for light products, has not been covered by the increase in conversion capacity to produce light products from even fairly heavy crude. The problem of insufficient conversion capacity has become more acute with the mobilization of residual OPEC production capacity, consisting largely of heavy, high-sulfur crudes.

As we can see, the shortage of conversion capacity represents a bottleneck, beyond which distillation capacity is barely adequate. Although conversion capacity is up in various parts of the world, this increase falls far short of what is needed.

For conversion, the unit cost of investment is extremely high: about 500 million or one billion dollars. Discouraged by thirty years of low margins and closing refineries, the refining industry is hesitant. Nevertheless some investments are being made, such as Total's decision to build a conversion unit at its Gonfreville refinery.

This new paradigm is illustrated by the long-term price trend, which reflects market expectations concerning the long-term equilibrium between supply and demand. Today, one can buy oil for delivery in 2012. This market is not very large, yet it is still quite significant. Until late 2003 or early 2004, forecasts of long-term equilibrium on the oil market were based on a price equilibrium ranging between $15 and 25. The point of equilibrium has risen very significantly since then. Today, the long-term price is between $55 and 65 a barrel, which gives reason to think that the tensions that have affected the market since 2004 will last for a number of years.

Apparently, the market has lost a number of its points of reference. For analysts, the industrial stock trend used to be very important. Between 1995 and 2004, the correlation between OECD stocks and the crude price was extremely good. Starting in 2004, there was no longer any correlation: the crude price varied independently of changes in the stock levels. The crude price seemed to depend on other variables, with the oil market reacting to signals that were either structural (e.g. available OPEC capacity or refining capacity) or "situational" (e.g. related to the climate/weather or geopolitics). This loss of a reference framework is something new.

Stimulated by high prices, oil activity is up across the board, but limited by another bottleneck: human and technical resources are at saturation point. Order books for oil and gas companies and their equipment and service suppliers are completely full, and there are not enough high-level technical personal to meet demand. In the offshore sector, business is booming to such an extent that the drill-rig utilization rate is reaching record highs. Drilling platforms are reserved several months ahead of time. Day rates have soared in recent months and even tripled for semisubmersible platforms and jack-ups in the North Sea and the Gulf of Mexico.

Will the situation change in the short or medium term, for instance, as regards available OPEC production capacity, an important criterion? Over long periods, between 1990 and 1998, OPEC capacity increased by 0.7 to 0.8 million bpd on average (not including Iraq and Kuwait). In the wake of the 1998 price collapse and the demand slowdown tied to the Asian crisis, OPEC capacity stopped rising and even decreased slightly. Yet it has been announced that OPEC capacity will increase by 1.5 million bpd in 2006. Does this change of pace herald several years of increases similar to those observed early in the 1990s, or an effort that will be hard to sustain with the natural decline of the "old" fields typical of the Middle East?

As I mentioned earlier, the gas market in 2005 was tight. These tensions amplified the uptrends observed in the last five years. One can even consider that some geographic areas found themselves confronting real gas crises. In the United States, the gas price fluctuated in the vicinity of 10 dollars per MMbtu, compared to 2 to 3 dollars per MMbtu in the mid-1990s. The English spot market posted extreme highs, with the price even spiking at the equivalent of 150 dollars a barrel in recent months. This is much higher than the maximum prices ever reached on the oil market: in 1982, the price per barrel hit 120 dollars, but for only a day.

In 2005, gas prices rose in all geographic areas. In Europe, they rose by 50% to reach more than 6 dollars per MMbtu. The spot price at the National Balancing Point (NBP) in England approximated 7 dollars per MMbtu (+60%). The American market, which was already high, did not rise quite as far percentage-wise but reached equivalent levels in the vicinity of 7 dollars per MMbtu. In each case, the reasons were very different.

On the continental European market, the price is indexed on the oil price. Therefore, the increase in the price of gas reflects the increase in the price of oil.

In England and the United States, however, the market is deregulated and price hikes reflect the real imbalance between supply and demand. Domestic production is stagnating in the United States and falling in Great Britain, while growth is rising and other sources of supply are proving insufficient. This in itself can have major consequences on electricity production, which is increasingly the main driver behind gas consumption. These price uptrends were also affected by Hurricanes Rita and Katrina, causing very significant production decreases in the United States that aggravated tension on this market.

This leads to questions about the price trend and about how prices are set on the gas market. In continental Europe, the gas market is basically indexed on the price of petroleum products within the framework of long-term contracts. It is interesting to note that, in late 2004 or early 2005, the English company Centrica signed a fifteen-year contract with Petronas that indexed the price on the English spot market (NBP) prices. Usually, spot prices are opposed to long-term prices. As a matter of fact, the real opposition between the deregulated market and spot market lies in the way prices are set, i.e. what type of benchmark is used (gas sector or oil sector). The fact that gas prices are skyrocketing on all markets leads to the question: "Should this price-setting mechanism – apart from the issue of long-term contracts – be maintained and for how long? "

Soaring oil and gas prices have led to soaring profits for oil and gas majors, which have significantly increased their investments. Still, the latter remain limited, primarily for two reasons. First, there are still a number of inhibiting factors. Access to oil and gas acreage remains problematical, there are few opportunities and there is a shortage of technical and human resources. Second, although the outlook for the price per barrel is good, industry majors are acting cautiously, because they fear that oil prices will dive like in 1997-1998. They are still making investment decisions based on a price per barrel of 20-25 dollars. As a result, they are redistributing a large proportion of profits via dividends or stock repurchase operations.

These buyback operations and substantial profits have had some political repercussions: public opinion and government authorities think that oil and gas companies should reinvest their earnings more massively. This debate is still underway. In my opinion, as oil and gas companies in Europe and the United States disclose their financial results, this subject will be raised again.

Permit me a word about the environment, for 2005 was not a year of unmitigated success on the international scene. The results of the Montreal Summit were lackluster, with the United States and Australia still refusing to sign the Kyoto Protocol. The good news is that they are open to discussion about what direction to give Kyoto in the future. In Europe, however, this was the first year of operation for the CO_2 emissions allowance trading market. During this year, the price trend reflects the evolution of the industry's perception of the constraints represented by the allowance system and the fight against climate change. At the beginning of the year, the price started at about €5 per ton of CO_2 then stabilized at about €20-25/t. This gives us an indication of what the cost of CO_2 might be in the industry's energy-related investment decisions.

What does the long-term outlook look like?

In the oil industry, even if exploration-production activity rose very substantially in 2005, as illustrated by the services and equipment shortage, the market will probably not gain enough new production capacity to restore surplus capacity to the 1990s level. In non-OPEC countries, if there is any increase in production capacity, it is expected to be moderate. Production in certain key areas like the North Sea can only go down, which must be taken into account. In addition, OPEC production is increasing at a very prudent rate.

In the refining sector, a number of projects are on the table but most of them are still in the design phase. And bringing new distillation or conversion capacity onto the market, which would relieve pressure at current bottlenecks, will be a long and painstaking process.

The only thing that could help boost surplus capacity back up to the average 1990s level is a sharp slowdown in demand. Attempts to forecast future demand must integrate uncertainty concerning the real development potential of China and India, and the impact of prices on demand.

Generally speaking, there is a strong correlation between per capita consumption (electricity and oil for the transport sector) and per capita income. Today, China is posting per capita consumption (for both electricity and the transport sector) equivalent to that of Japan in 1955-1960. Recent travelers to China, at least to coastal areas, cannot help but notice the resemblance between current Chinese urban planning, transport systems and lifestyles with those of Japan. If we look at Japan's per capita consumption figures over the last forty years, we can get an idea of the magnitude of what lies ahead if, as is highly probable, all or part of China progressively follows suit.

Does demand respond to prices? This question brings us to the problem of domestic price systems, which vary greatly from one country to the next. Some countries tax prices very heavily (such as the OECD countries) whereas others heavily subsidize prices (often the case in developing countries). In the first case, when taxes are high and play the role of shock absorber, the impact of a price hike is very low. In France, for instance, if the crude price triples, the price at the pump only goes up 25%. Many developing countries have another type of system, so the mechanism works differently. For social reasons, petroleum product prices are very heavily subsidized, so when prices skyrocket, subsidies must be increased substantially.

I have been given one figure that I have a hard time believing. In Indonesia, about 30% of the national budget is spent on subsidizing petroleum product consumption. Obviously, an upsurge in prices places an unbearable burden on these national budgets, knowing that if subsidies were to be eliminated, the outcome would certainly be a revolution, with many bodies in the streets. In 1988, a slight increase in prices in Venezuela immediately led to a death toll of 7,000.

Some countries have run the risk of eliminating subsidies. In 2004, Thailand did so for gasoline but continued to subsidize diesel fuel to avoid the social repercussions, which would have been more serious. Demand immediately responded with a significant drop in gasoline consumption. The consumption of diesel fuel, however, continued to rise.

What will price trends look like in the next few years? That's the big question. Have we entered a new cycle in which prices will inexorably drop, perhaps even as far as the 1998 level? Or, on the contrary, do we find ourselves with a new paradigm that breaks with the past? I think both are true. Like all raw material markets since the second oil shock in 1986, the oil market is cyclical: prices go up, production increases, demand slows somewhat and prices come down. Today, what we can say is that the market has to remain cyclical and the phenomemon must subsist. But prices are very different today compared to 1986-2004, when the price per barrel fluctuated between $15 and 25. From now on, the market will continue to be a cyclical market, but with prices fluctuating in the $40 to 60 range.

On the gas market, what kind of changes can we expect? Looking long term, this market is characterized by a number of constants. Demand for gas should continue to accelerate faster than the total rate of growth for energy. Global exchange transactions should more than double between 2003 and 2030. The largest consumer regions should become increasingly dependent on imports.

But it should be stressed that there are new uncertainties. There is uncertainty about what the best price-setting system might be and how high prices will impact demand. With prices spiking occasionally at 150 dollars a barrel in Great Britain, one wonders how gas – for years the preferred option, especially for electricity production – can continue to be the energy of choice. Won't there be less call for natural gas, and more for nuclear power, coal or renewable energies? In this respect, it is significant to note that in the space of one year the International Energy Agency has lowered its demand trend forecasts. Last year, it said that gas demand would grow at a rate of 2.3% per year over the next thirty years. Today, its estimate has been reduced to 2.1%.

Let me conclude by making a point that I think is important. All over the world, political awareness of long-term consequences is rising. The upsurge in prices only had a marginal impact on energy demand in industrialized countries, but that does not mean that the long-term impact will be marginal. There has been an acceleration in the formulation and implementation of energy regulations and policies. Many national action plans have been developed to reduce energy dependence by reviving programs to curb demand or boost the use of domestic energies (nuclear, renewable, coal for countries holding large reserves). There is also a growing awareness of security of supply problems. For example, we might mention the recent "State of the Union" speech made by Georges W. Bush, in which he rediscovers the importance of energy policy.

Let me quote Mr. Bush. This is something I rarely do, but I think what he says is very significant, because it indicates a shift in policy and a new awareness to energy problems. Mr. Bush said: "America is addicted to oil which is often imported from unstable parts of the world. The best way to raise this addiction is through technology". He is perfectly right, and working on technology is what we do at IFP. We are convinced that technology will contribute many solutions. "Breakthoughs on this other new technology will help us to reach another break goal to replace more than 75% of our oil imports from the Middle East by 2025. By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy and make our dependence on Middle East oil a thing of the past". What he says might have an impact.

Let's take biofuels as an example. The United States and Brazil, the world's largest ethanol producers, plan to double production by 2010. Europe has set ambitious goals: biofuels must account for 5.75% of all motor fuels by 2010 and about 10% by 2020. In 2005, there was already a significant increase: the production of ethanol rose by 15% and biodiesel by 30%.

In conclusion, 2005 did not mark the end of oil, but the end of cheap oil. We must realize that a new era is starting. 2005 saw a tight gas market, sharp price fluctuations and an unprecedented gas crisis in some countries. During this past year, energy also made a comeback to the forefront of public and governmental concern, particularly in the industrialized countries, which may augur well for the future.