Europe Needs Oil Indexation More than Ever

Sergei Komlev

Head of Contract Structuring and Price Formation Gazprom Export

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What we often hear is that the gas market must react to the dramatic, or even tectonic, market changes that have taken place in Continental Europe over recent years with wholesale adjustments to long standing, proven, pricing mechanisms. Before delving into details of these possible adjustments let me first bring your attention to the various options available to the European buyers and sellers.

On one extreme there is an Asian pricing model. There are LT contracts in place with 100 percent oil indexation, no hubs, but OTC trading is available. Although similar contracts could be found in Europe with respect to LNG contract deliveries, it is unlikely that this pricing model will ever become established on the Continent, even though it is fully acceptable to gas producers.

The second option in our array of choices is the already existing hybrid, two-tiered, pricing model. This model is represented as a combination of mainly oil product indexed LT contracts plus hub pricing. I am using the term hybrid in order to indicate that these two different pricing methods within one model do not exist in the parallel worlds, while they are closely interconnected and operate as a single, unique, mechanism.

Please allow me one observation before we go further on. We have an impression in Gazprom that there is a tendency for Europeans to experience a self-imposed “inferiority complex” when comparing their existing pricing model with that of the liberalized American or British variants. The meaning of the word “liberalized” is, in itself, key to understanding this complex. This word implies that the existing pricing system on the Continent, dominated by the LT oil product-indexed prices, is archaic and outdated. The new “liberalized” subsystem within it is immature.

I will try to illustrate that Continental Europe has developed a unique hybrid pricing system based on the symbiotic coexistence of oil and gas indexation. Under the existing model, oil-indexed prices play a leading and dominant role, while hub prices play a balancing and subordinate role. This comprises a purely market-driven and highly competitive system although competition manifests itself in a different way compared to the Anglo-Saxon pricing model. What I will demonstrate in my presentation is that the Continental market has not only its own unique organization but it is mature enough to perform the functions that it is designed for. There is no cause for such an inferiority complex.

Most surprisingly, perhaps, is that those who call for changes on the Continent, British consultants including, do not point their finger at the USA with its paramount model based on supply and demand. Rather, they point their finger to something else. One of our clients dubbed this model a “re-engineered” pricing model. I would personally tend to call it “genetically modified” because this model combines two incompatible things - hub pricing and LT contracts with nominations coming from a buyer.

Put differently, while there are four options available the choice is in reality between the existing hybrid and the American gas pricing models. Indeed, if you want pricing based on supply and demand and there are liquid hubs available there really is no need for LT contracts. However, in this case nominations will come from the producers. If you prefer LT contracts as a security of supply instrument than you must adhere to the existing hybrid model. There is no other manner in which one might combine the best of the two worlds in the interest of the buyer simply because it leads to unfair allocation of contract risks which simply are not acceptable to a supplier.

Chart 1. Optional Pricing Models for Continental Europe Gas Market

Model	Applicable To	Description	Supplier Acceptance
Oil Indexation	Asia	• LT contracts • 100% indexed to oil • No hubs.	Yes
Hybrid	Continental Europe	• Primarily, LT oil/oil product indexed contracts • Minimal gas-indexed component in LT contracts • Hub pricing	Yes
Modified	Continental Europe (?)	• LT contracts linked to gas indexes • Hub pricing	No
Hub	North America	• Absence of LT contracts • Pricing based on supply & demand	Not the best option for Continental Europe

Nevertheless, there is strong pressure on Gazprom to adopt a “reengineered” pricing model. There are analysts who suggest that transformations of the hybrid pricing model could be carried out in an evolutionary way, simply by means of increasing the share of spot component in the LT contracts at the expense of oil indexation. Although we understand the interests behind this proposal, we can only say that a move towards supply and demand pricing desired by so many could not be accomplished because hub prices on the Continent are not a function of total supply and demand.

In contrast to North American hubs, hubs in the hybrid pricing model do not provide a true indication of the supply-demand balance because the Continental European market comprises a complicated structure of long-term and short-term contracts. Therefore, Continental hub pricing is not a function of total supply and demand but a function of

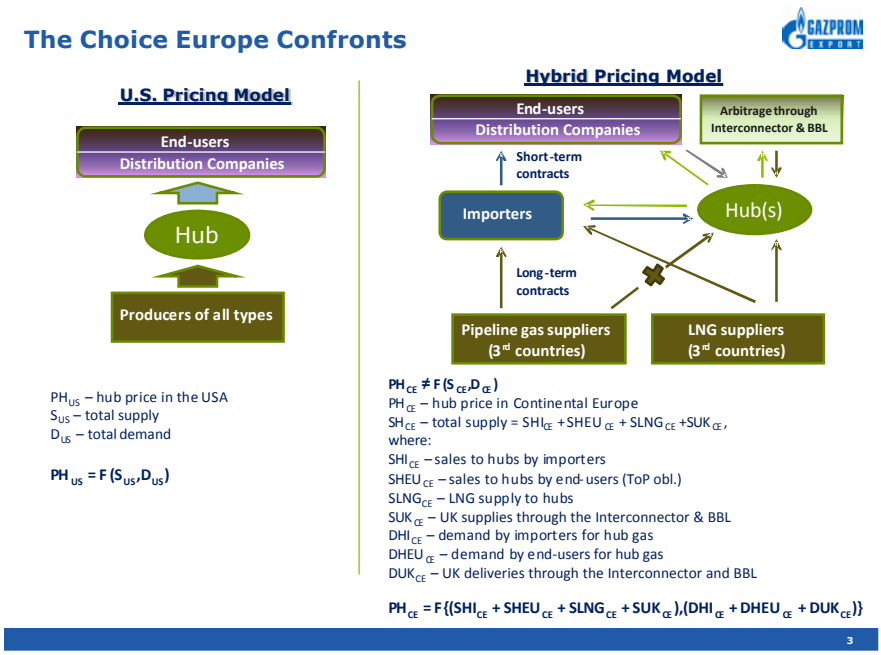
something quite different; arbitrage of all kinds, between different contract pricing structures, between contract and spot prices, between hubs, between the UK and the Continent. In fact, the market in Continental Europe is an ideal stage for arbitrage. Is there a need to devastate this paradise for the arbitragers?

Continental Europe utilizes a multiplicity of supply prices. This contrasts starkly with the USA where there exists the one price (Henry Hub) and all other pricing is derived from it. Portfolio optimization on the Continent falls upon the gas procurement managers who evaluate and select from among the existing supply options. Should the Continent drift to the American model, the nominal "one price" will take the form of the most expensive marginal shipper. Consequently, all buyers will have to pay this price.

One should pay special attention to Chart 2. Leading European gas analysts will likely not show you anything of this kind as it probably perceives no difference between the models, and apply the same neoclassical postulates to both the USA and European gas markets.

Another important conclusion you may draw from this chart is that our clients are not interested in preserving the value of the commodity they are selling. Low spot prices increase revenues from arbitrage and are only limited by take-or-pay obligations.

Chart 2



Let me turn from the rather abstract observations to real world evidence that hub prices on the Continent are not set by total supply and demand.

I will remind you of the hub price behavior at the time of the Ukrainian transit crisis. When the Ukrainians reversed "East to West" gas glows to the opposite direction, the Continent was shorted 240 mmcm a day of gas supply in the first three weeks of January 2009. Regardless, prices on the liquid hubs did not react.

Please allow me also point out that the growth in hub prices in the third quarter of 2010 came as a great surprise to nearly all market participants and their well-paid consultants. These consultants had already trumpeted the accuracy of their longtime predictions and proclaimed a new era in European gas pricing.

However, the growth in hub prices occurred at a time when the recession was not yet over and Europe was not yet short of gas; indeed, demand in the third quarter of 2010 was lower than in the third quarter of 2009. Expectations of a new wave of LNG, as reflected in the low futures prices seen at the end of 2009, were negatively affecting sentiment in the market, but not the real price curve. What had, in truth, occurred is that additional volumes of Qatari gas reached the European market in the third quarter of 2010. But contrary to economic theory and conventional wisdom, these volumes have not led to a further decline in the spot price but rather to a major increase in hub prices and their convergence with the oil-indexed contract prices.

It is clear that supply and demand drive Continental hub prices only to a limited extent and that arbitrage opportunities produce unexpected effects on prices. A new development in arbitrage on Continental hubs over the crisis period is the involvement of large volumes of gas under take-or-pay obligations of the short-term contracts.

Many end-users and distribution companies in the EU lost their right to make-up gas because of the short-term nature of their contracts. You might have noted that BKartA (Germany) introduced limitations on contract duration beginning October 1, 2007. End-users and distribution companies have only two options – to pay fines for gas that is not taken, or to dump the gas on trading hubs, thus reducing their losses by whatever revenues they may earn from those sales.

Gas volumes under take-or-pay obligations dumped on the hubs, in our view, put enormous pressure on spot prices and this has been the main reason behind the divergence in spot and contract prices. This divergence was misinterpreted by many analysts as signal of a complete “de-marriage” of oil-indexed and gas-indexed prices. If the make-up gas opportunity was available, there would be no need to dump “take-or-pay” gas on the hubs. No major diversion of the hub and contract prices would take place as a result.

Not capable of explaining hub price boost in the third quarter of 2010, many analysts simply preferred to ignore it, claiming that gap between the hub and contracts prices narrowed as a result of the cold winter, the Fukushima accident, and the turbulent political environment in North Africa. To argue that markets anticipated these events several months before they occurred does not seem credible. In reality it was a reset of the arrangements under short-term contracts as new contracts took effect at the beginning of the new gas on October 1, 2010. Dumping of the over contracted gas volumes stopped and that caused escalation of hub prices in Europe in the third quarter of 2010.

Two and a half years of abominably low spot prices in Europe have created the illusion that gas has lost its link to oil once and forever. This is not true and could not happen simply because oil-indexed contract prices serve as the underlying benchmark for arbitrage on the Continental market. Temporary decoupling of prices occurred as an unintended result of end-user contract duration shortening at a time of unexpected demand contraction.

What we often hear is that the hybrid pricing system is outdated due to a lack of competition.

Oil-indexed contract prices serve as the benchmark price on the Continental market. But that does not mean that the hybrid pricing system creates impediments to upstream competition and therefore has to be replaced with something else? In fact the Continental market is highly competitive (as shown on the Chart 4).

This market is amply supplied with gas originating from long-term contracts. The existing contracts that Gazprom has with its European clients alone allow for a supply boost of 30 bcm, from the current 150 bcm per annum to 180 bcm. Competition among the major exporters in the Continental market is already tough and gas importers have additional supply options available to them. If they prefer to take only 150 bcm of Russian gas, that means that there must be other sources of cheaper gas that could be acquired through other long-term contracts or from the hubs. In 2011 gas from Qatar and Nigeria turned out to be more competitive than other sources and, as a result, increased market share for these two suppliers.

Chart 4

Dual Pricing Model Supports Competition

Major Gas Exporters

(bcm)

	2010	2011	Δ (bcm)	Δ (%)
Gazprom	138.6	150.0	+11.4	+8.2%
Algeria (incl. LNG)	57.3	52.0	-5.2	-9.1%
Libya (incl. LNG)	10.3	2.5	-7.8	-75.8%
Qatar	32.9	41.6	+8.7	+26.5%
Nigeria	13.5	18.1	+4.7	+34.7%

Major Gas Producers

(bcm)

	2010	2011	Δ (bcm)	Δ (%)
Norway (incl. LNG)	115.4	111.9	-3.5	-3.0%
Netherlands	76.5	76.3	-0.1	-0.2%
UK	64.5	51.8	-12.7	-19.7%

Sources: International Energy Agency database , Eurostat, national statistical agencies, Wood MacKenzie, Lloyds as of January 2012

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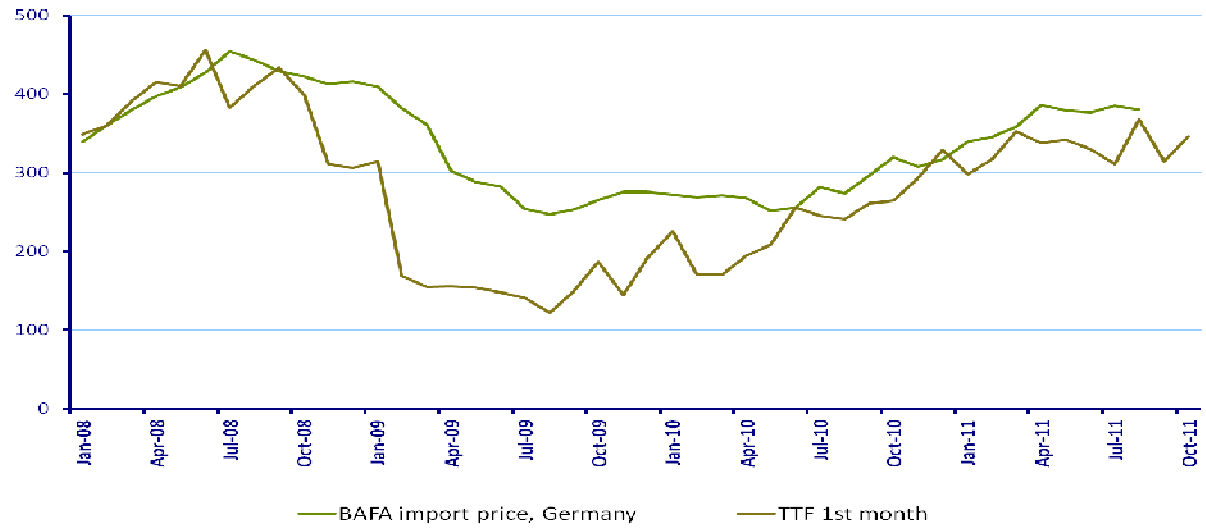
In the USA prices are low now and serve as indication of the oversupply caused by shale production boom. As previously mentioned, spot prices on the Continent are a function of balancing rather than total supply and demand relationship. Therefore, strictly speaking, Continental hub prices do not serve to indicate whether there is a glut or deficit of gas irrespective how high they are in the absolute terms. The only representative indication of gas glut on the Continent is the emergence of volumes of “make-up” gas.

Once the importers who typically hold LT contracts with multiple suppliers have exercised arbitrage options, spot prices tend to settle at a discount to the contract prices (adjusted for the transportation costs) and the value of flexibility provided by the pipeline suppliers. A

good question might surround the price for this flexibility? One, two, or could be 3 dollars per MMBTU?

Chart 5. **Asymptotic Contract and Spot Price Behavior**



A second reason why spot prices usually lag behind contract prices is the existence of one-side balancing on hubs. In the case of a short-term undersupply, it would be more convenient to use the existing long-term contracts arrangements for securing additional deliveries. In the case of oversupply, selling gas at hubs is a quick-fix. A good example of a one-sided fix is the Finnish market, a "gas island" with prices lower on a small hub than that coming from one single supplier under LT contracts.

In the few cases when spot gas is more expensive than contract gas on the Continental market, it is a result of the inadequate capacity of the gas infrastructure at a time of strong demand for gas. The more developed this infrastructure is and the more integrated the EU domestic market is, the rarer will be instances when spot prices rise higher than as contracted.

The relationship between hub and contract prices may best be described by the mathematical term, “asymptotic”. The asymptote in our case is the distance between the contract and hub prices that approaches zero when market moves to equilibrium and is becoming more and more integrated. Hub prices may cross the contract price line yet that constitutes the exception rather than the rule.

There is also another reason why producers can not accept the "re-engineered” pricing model.

The specific character of natural gas price signals in Europe is demonstrated by the extremely low churn ratios at Continental hubs. Let me remind you that churn ratio is a ratio

of total trades including paper trading conducted at a hub to trades that imply physical delivery. In order to produce sustainable price signals, the churn ratio has to be at least 15. In Europe, only the NBP meets this condition. Continental markets do not pass this test. Some analysts say that low churn ratios on the Continent are a reflection of the transition phase, and that, as hub markets mature, churn ratios will grow. I am pessimistic with respect to the further virtualization of the hub trades. It is not because there is a lack of appetite on behalf of European financial institutions to play with the forward curve. Simply put, it is extremely hard to predict what the price on a balancing market will be in two or three years because these prices are not about supply and demand but rather about arbitrage opportunities. There are too many moving parts in the balancing market that must be taken into consideration. To establish a rational forecast for a period of time extending more than 9 months appears to be a “Mission Impossible”.

On the Continent the available financial instruments usually offer hedging opportunities that are limited in duration to only six to nine months. It is no simple coincidence that the maturity of forward instruments equates to a base period in the LT supply contract formulas. Prices of LT contracts for oil products indexed formulas are usually more or less predictable.

Churn ratios for Continental hubs are low and do not look likely to increase. The major conclusion from it is that we will not have just one global price for gas in the foreseeable future. Prices in the USA are a function of supply and demand. Contract prices in Japan have nothing to do with gas supply and demand. Hub prices on the Continent are a function of arbitrage and this environment is a paradise for the arbitrageurs already. In this sense, it is a mature market by now. In a similar way, it would be wrong to say that a pony is not, in actuality, a horse but that it is simply another animal.

Gas producers cannot accept a proposal to make contract and spot prices comparable by lowering contract prices. In most cases, spot prices will respond immediately by decreasing further. That is, any further decreases of contract oil-indexed prices would result in a new cycle of spot price downward adjustment. Contract price reduction may make sense only in the case it increases long-term contracts offtake. This is likely to occur only when there are other suppliers that are hesitant to deliver gas at a reduced price.

A summary of the fundamental differences between the two pricing models is presented on Chary 6. One has to make a clear distinction between the models. The drive towards the American pricing model in electricity trading in Europe has already resulted in higher prices. A recent study published in the European Energy Review shows that in France, since the coupling of markets with its neighbors, nuclear power has become the marginal producer (and thus sets the price of electricity) only 12 percent of the time against 60 percent of the time when France was isolated. This means that in the new situation, electricity in France will be billed at a higher rate at least half the time compared to the old situation. In respect to gas market it means that a country with a source of cheap gas supply could loose this benefit once prices will be determined by the total supply and demand.

Chart 6. USA & Continental Europe Pricing Models Fundamental Diffrences

1	USA	Hub price is a functio n of total demand and supply
	Continental Europe	Hub prices are a function of multiple examples of arbitrage
2	USA	One price at a level determined by Henry Hub
	Continental Europe	Multiplicity of prices Company supply managers determine the price of gas portfolio
3	USA	Majority of gas is sold on hubs Majority of LT export contracts incorporate diversion clause
	Continental Europe	Less than ¼ of physical trade on hubs represent primary sales The remaining volumes of gas traded come from LT contracts for pipeline gas
4	USA	High churn ratios
	Continental Europe	Churn ratio below 4 (low, but sufficient for balancing market)

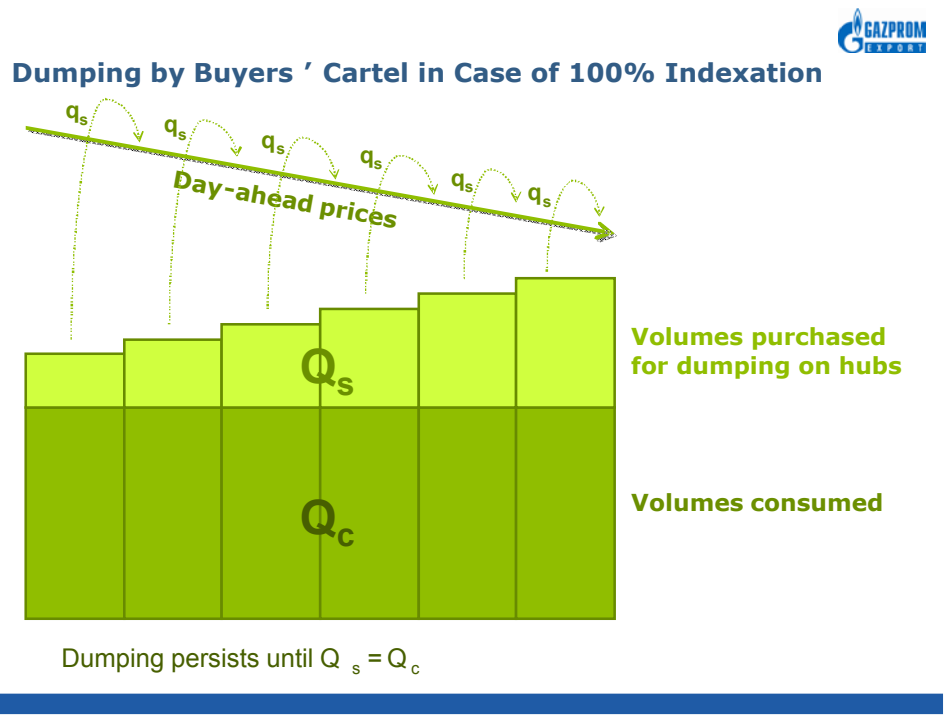
Elimination of oil-indexation and, thus, a two-tiered pricing system is not an appropriate means of simplifying interactions between market participants on the Continent. The move to 100% gas indexation in long-term contracts is unacceptable to gas producers. The fact that low churn ratios at Continental hubs raise doubts as to the quality of their price signals is only one factor.

Chart 7 illustrates a mechanism for predatory pricing in case of 100% gas indexation. As I have already mentioned today, transitioning to gas-indexed contracts will not change the balancing nature of the European gas market. It doesn't matter how much lipstick you put on a pig, it still remains a pig. As prices here are not determined by the total continental supply and demand relatively small additional volumes bought for the dumping purposes could bring day-ahead prices down. Losses from dumping by a cartel of buyers will be fully compensated next day with a profit when a lower day-ahead price from a previous day

devalues the entire supply portfolio. This predatory pricing is possible until volumes needed to lower hub prices reach the size of the volumes consumed.

Producers from the third countries will be running an intolerable risk of gas price erosion because there is virtually no force in Europe interested in preserving the value of natural gas. Producers in the EU (Dutch and British) are definitely not interested in selling gas below cost though it is lower than for suppliers from the third countries due to their high transportation and liquefaction costs. Indigenous producers have easy access to the hubs and can buy gas to meet their contract obligations when hub prices drop too much. Production could be resumed in a swing mode when prices are higher than their costs.
Pipeline producers from the third countries who do not have easy access to the market hubs find themselves disadvantaged. Practically speaking, it is not possible for Gazprom to agree with its clients that it will meet its contract requirements with gas bought at the hubs when it is cheaper than contract gas. If the oil-linked benchmark price ceases to exist, exporters selling gas under LT contracts will be forced to accept prices irrespective of how low they are without any leverage to influence these prices.
To conclude. Unjustified demands of gas importers that producers should be fully responsible for price risks in long-term contracts alter the fragile balance of interests between buyer and seller. Pushing these demands will lead to nothing else but the demolition of long term supply contracts. Indeed, if markets are liquid enough, there is no need for long term supply contracts.

Chart 7



Critics of oil indexation often claim that it is outdated because there is not much demand side substitution between oil and gas nowadays. However, demand side substitution has not been the case in Europe for more than 20 years. Residential users that switched once to gas from fuel oil were not keeping a fuel tank in their backyard in order to use it should gas prices become the higher cost fuel choice. Limited day-to-day substitution or even its absence does not rule out a deep rooted relationship between oil and gas.

There are several reasons the days of oil indexation have not passed, apart from its unique role in supporting long-term investments:

1. Gas competes with oil in the residential sector. One third of houses in Germany still use oil products for heating.
2. Gas nearly replaced oil in European power generation 20 year ago. Therefore, the argument presented by the Oxford Institute for Energy Studies suggesting this means there is no longer a rationale for oil indexation is invalid.
3. Even though there is not much demand-side substitution between oil and gas in power generation in Europe, there is still more than a virtual relationship between the two fuels;
    - Merit order puts oil products and gas in the same category of fuels used in peak or semi-peak. In that sense, there is a stronger competition with oil products than with coal which is used in base load only.
    - Oil products are a reserve fuel for many power plants and industries if gas supply fails.
4. The oil-gas linkage will only strengthen in the future as a result of direct competition in the transportation sector due to the increasing popularity of natural gas-powered vehicles and the use of LNG as a marine bunker fuel. Gazprom anticipates that European consumption of gas in transportation applications may grow from the current 3 billion cubic meters per annum to as much as 100 billion cubic meters in 2030.
5. There is a new rationale for oil indexation – that relying on the linkage with oil makes gas inflation-indexed. Factoring oil products into the formula perform the function of a universal deflator better than any other man-made price index, be it CPI or PPI.

The existing market structure on the Continent is, at a minimum, satisfactory in that it offers win-win options for both buyers and sellers. However, the balancing nature of the Continental market has to be taken into consideration by major players, including the regulators. We fully understand our clients who tell us that do not care about the theoretical pricing models but prefer spot-priced gas because it is cheaper. However when we tell them to buy more from hubs to lower the average price of their portfolio they say that they cannot fully rely on hubs as their source of supply, would still prefer to get gas from us but at a gas-indexed price.

But we cannot support market reforms that are conducted without a full comprehension of its consequences. An obvious lack of even modest resultant benefits to end-users only compounds the negative aspects of this issue. Reformists should be careful when giving competitive advantages to one group of market participants at the expense of another. They should clearly understand that what they are reforming is a unique market which is in fact a balancing market. It is a "different beast" than the U.S. market and therefore has to be treated in a way that allows long-term oil-indexed contracts and spot gas to complement each other. It is not a dilemma - oil-indexed gas or spot. It should be both.

So far competition enhancement policy has only divided European gas market participants. A broad group of market players emerged that have no import contracts, bring no gas to Europe under long-term arrangements, and are not responsible for its storage and deliveries structuring. Advantages without responsibilities for this group of players results in unfair competition. If the market reformists are not pursuing an implicit aim of pushing importers out of the business what they have to do is to protect these holders of LT upstream contracts from unfair rules of the game. Participants of end-user supply tenders should meet strict qualification standards including a requirement to have import contracts. That qualification is also important for a security of supply purposes as many discount suppliers without the import contracts have already went out of business (like TelDaFax in Germany) because they were not able to keep their promise to deliver cheap gas when hub start to converge with contract prices.

Transitioning to the American model; that of hub pricing without long-term contracts and direct sales by natural gas producers, is not a suitable option for Europe. As a matter of fact, Europe is increasingly import-dependent and there are oligopolistic structures on both sides of the market that will end up opening a Pandora's Box of endless conflicts. With oil-indexation in place, consumers of gas in Europe are protected from any form of price manipulation by the dominant supplier because none of these suppliers is able to influence the price of oil. We can expect that inspections by the EU antitrust authorities similar to those conducted in Gazprom affiliates in October 2011 will be conducted on an on-going basis once Europe adopts an American style hub model. Acrimonious, rather than cooperative, relations are not in the interests of Europeans, as they will undermine the security of supply.