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Faut-il gérer ou céder les risques ?

DIFFÉRENTES MÉTHODES, MARQUÉES TEMPORELLEMENT ET GÉOGRAPHIQUEMENT, PERMETTENT DE LIMITER LES RISQUES EN MATIÈRE DE FIXATION DES PRIX DU GAZ. PANORAMA DES DIFFÉRENTES OPTIONS OUVERTES À L'EUROPE CONTINENTALE.

How to manage gas price risk?

THERE ARE THREE KEY PRICING MECHANISMS for non-renewable (energy) resources in general and for gas in particular. They are aimed at different methods of diminishing/mitigating gas price risks.

Cost-plus (net-forward) pricing dominates at initial and non-competitive stages of “physical gas” markets development. This pricing method mitigates gas price risk by forming and supporting the price always above the level of production as well as transportation costs (CAPEX plus OPEX plus taxes) up to the delivery point. Additional “plus” component is rate of return which, within non-competitive gas world at its early stages, could be both “reasonable” and unreasonably high, but also low or even negative (say, in non-market-based economies).

Net-back replacement-value-based (NBRV) pricing dominates at the next stages of gas markets development – at the periods of steady “physical gas” markets growth. This is the stage of competitive energy markets. Gas at this stage competes with other energies in the end-use. This is why gas price risk is mitigated by establishing special formulas linking gas price to the prices of its replacement (competing) fuels with the relevant discount. It also provides regular price reviews. Mechanism of such indexation guarantees that gas price is always competitive to (below than) its alternative fuels in the end-use.

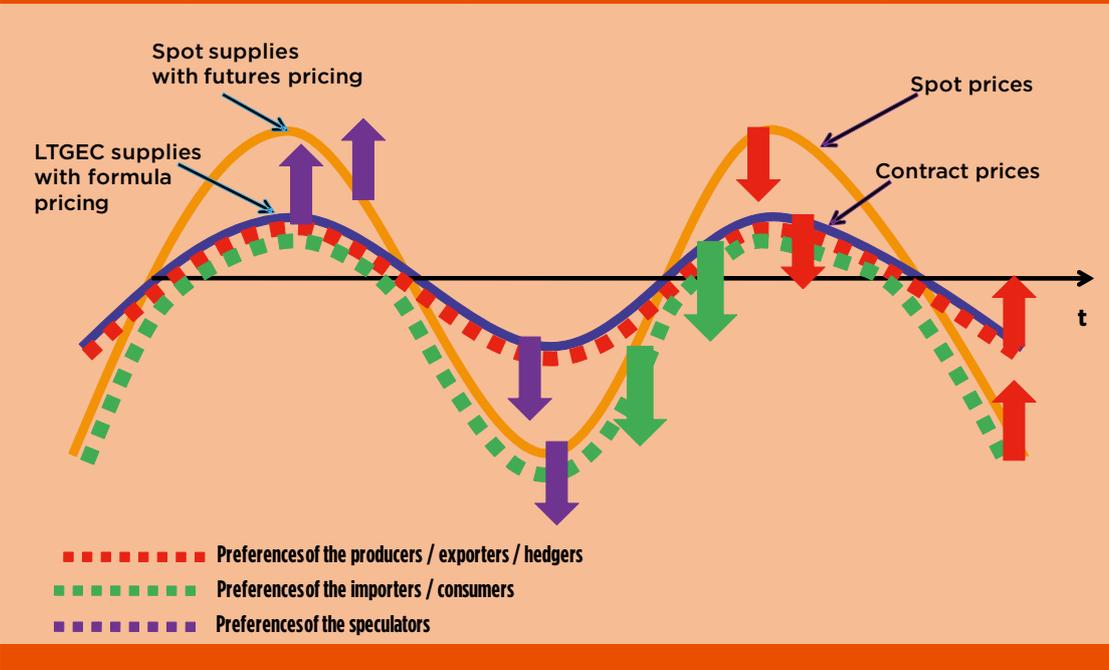
Exchange-based (commodities) pricing usually appears at the mature stages of gas markets development and represents pricing mechanism of the

competitive markets, where both “physical” and “paper gas” markets coexist. This price is based not only on demand-supply equilibrium, but accounts for changing perceptions of the market players. The more “paper gas market” is developed, the more perceptions of the speculators (those who sell and buy gas contract without aim to deliver physical gas) and not of the hedgers (those who use financial instruments to mitigate price risks of their transactions in “physical gas” market by instruments of “paper gas” market) dominate in price fluctuations. The more international/global the market of individual commodities is (say, today’s oil and – possibly? – future gas) the more it is integrated with the global financial markets, the easier it is for financial speculators to provide “horizontal” flows of their liquidity from global financial to “paper” segments of individual commodities markets. Finally (as it happened in the global oil market since mid-2000, and may happen in the future gas market if it follows the path of global oil) exchange-based price could be dominated by speculators and would reflect not an equilibrium in supply and demand of physical gas, but supply and demand in “paper” gas or gas financial derivatives.

FROM COST-PLUS TO NBRV THROUGH-OVER EUROPE & CIS

Prior to 1962 gas pricing in Europe was organized on a cost-plus basis. In 1962, the Netherlands’ government has proclaimed its new energy policy aimed at maximizing the long-term resource rent

Producers, Consumers & Speculators Price / Pricing Preferences



from the development of the then newly discovered super-giant Groningen gas field. Based on this principle a concept of long-term gas export contract (LTGEC) was established, known worldwide since then as the “Groningen LTGEC model”. LTGEC is not a pure trading instrument. It is, first of all, a financial tool which develops long-term capital intensive upstream projects (gas field development and creation of transportation infrastructure up to delivery points). Groningen LTGEC uses a net-back replacement value (NBRV) pricing mechanism with indexation formulae linking gas price to its replacement values at the burner-tip. At that time those were the prices of petroleum products which competed in the 1960’s with natural gas and electricity generation (residual fuel oil - FRO) and in the households consumption (light fuel oil – LFO). Since then petroleum-products-indexation within LTGEC has been the dominant export gas pricing mechanism in Continental Europe, slowly but steadily spreading over Europe and FSU in Eastward direction. USSR started to use LTGEC with this pricing mechanism since its first deliveries to the EU in 1968.

Due to petroleum-products-indexation, the higher the international oil price is, the higher the contractual price of gas calculated by the NBRV principles and the bigger the gap between the price levels calculated by two different pricing mechanisms (NBRV and cost-plus) is as well. This explains a lot about economic reasons behind political turbulences related to shifts from politically-motivated

cost-plus pricing to economically-motivated NBRV pricing within the FSU area in 2006 & 2009 and the absence of political turbulences when such shifts took place in the EU in 1962 and 1998.

It took almost 50 years to expand the NBRV pricing principle through Continental Europe and the FSU area via the existing EU-oriented gas value chains (network). In 2009-2010 it finally reached the Central Asian states.

THE PRICE DEBATE AND PRICING OPTIONS

During 2009 global economic crisis which, inter alia, has resulted in oversupply of gas in Continental Europe, share of spot market has increased significantly because (1) contracted gas above take-and/or-pay (TOP) provisions of LTGEC which was not in demand at contractual prices was sold at the hubs with a discount (primary sales), and (2) that one bought at minimum TOP levels and not fully in demand was also resold at the hubs with discount (secondary sales). At the same time the Third EU Energy Package (TEP) has entered into force in September 2009. Its further development has been initially aimed at spreading over Europe only spot/futures pricing. According to TEP, the future architecture of the internal EU gas market is to be based on entry-exit regional zones with virtual liquid hubs (marketplaces). And there is still an intention among the regulatory authorities that all ■■■

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■■■ existing contracts should be adapted to this new trading model, though it is the author's view that this adaptation is not practically possible!

CONTRACT VS SPOT: DIFFERENT STIMULI FOR DIFFERENT PLAYERS

In a gas market with both term and spot tradings there is a conflict of interests between three group of players: (i) producers/exporters, (ii) consumers/importers, who can be considered as hedgers (physical market participants), and (iii) speculators (paper market participants). Industrialists and their CFOs, are hedgers only with no interest to speculate since at the end of the day they will/may transfer the variability of input price to the consumers.

When the markets are tight and contractual prices going upward slowly (since in the contractual formulae gas price equals to weighted average for 6-9 previous months), spot prices grow quickly up with advanced speed. During that period, consumers and importers would prefer not spot, but contract prices. On the other hand, when there is oversupply in the market, spot prices diminish quicker than contractual prices and fall much below the latter thus explaining current preference of the consumers and importers for spot pricing. But price volatility (both corridors and frequency of price fluctuations) of the spot curve is much higher than of the contractual one (see "Producers, Consumers & Speculators Price/Pricing Preferences"). It was once again documented during recent extra-cold days in early February 2012: price difference between Russian contractual gas price and NBP price was equal to about plus 150 USD/mcm in mid-January, has overturned to minus 200 USD/mcm in early February, and then converted back to plus 100 USD/mcm in mid-February.

Producers/exporters/hedgers (Industrialists) are interested to go along the LTGEC pricing curve since it provides the lowest level of price fluctuations, the highest predictability and transparency of future price behavior due to indexation formulae. And they will be interested to diminishor/and narrow the price fluctuations gap, to decrease price volatility all of them being adverse to their (mostly long-term) investment and trade decisions irrespectively of the absolute level of gas prices.

As opposed to the previous situation, commoditization (Anglo-Saxon model) is the main driver of risks and volatility increases, with no benefits for Industrialists. The only beneficiaries are the Banks and other financial institutions which propose

derivatives to mitigate these increasing risks. But Commoditization develops a vicious circle of risks (as was clearly shown by the oil market development prior to and immediately after oil price peak of 2008): the broader the spectrum of risks at the paper market (due to globalization trends), the broader the spectrum of financial tools to mitigate these risks presented to the market by Banks. This results in higher earnings for financial institutions from their operations at paper commodities market with spot and futures pricing. The "losers" are the Industrialists (investors in upstream and downstream gas projects) since Anglo-Saxon model is detrimental to project investments and project financing.

GAS PRICING: WHICH OPTION FOR CONTINENTAL EUROPE?

Within current debate on future gas pricing trends in Continental Europe, five major routes exist:

- Switching to overall spot/futures pricing within the emerging internal EU gas market;
- Maintaining status-quo (staying with current LTGEC with oil-indexation formulae);
- Moving from current gas-to-oil price ratio equal to 0.6-0.8 to gas-to-oil parity;
- Possible radical changing of energy-pricing formulae in the long-term when gas price in result might even exceed oil parity;
- Adapting of current petroleum-products-indexation formulae within European LTGEC in line with historical evolution of the NBRV pricing concept in Europe.

Option 1. Go to spot/futures pricing? Such Anglo-Saxon model is the

preferred option for the EU regulatory authorities presented in their vision of further development of TEP provisions (regional zones with virtual liquid hubs). This vision was reflected in the initial drafts of the EU Gas Target Model (GTM) — late 2010 and till mid-2011. Even agreeing nowadays with de facto two-segment contractual model of emerging internal EU gas market (both term contracts and spot transactions), the preferred choice for EU regulators is still hub-based pricing (gas-to-gas competition as a pricing tool) for the whole EU market: both for term (even for LTGEC) and spot transactions.

But currently European gas hubs are not liquid with churn ratios measured in just single digits — at best from 3 to 5 and lower while it is generally accepted that break-even churn level for liquid marketplace is equal to 15. Only UK virtual hub NBP has its churn fluctuating around the marginal

**"COMPARED TO OIL,
GAS PRICE IS TO BE AT LEAST
2-3 TIMES HIGHER" (GECF)**

level of 15. Draft GTM has proposed even a lower breakeven churn level for European hubs to consider them liquid – 8 instead of 15.

On the contrary, today's level of US Henry Hub churn is about 400 thus exceeding most liquid European hub's (UK NBP) by more than 20 times and of other EU hubs by 100 times. And all gas hubs are much less liquid than key oil marketplaces (like NYMEX and ICE) with their churn levels measured by 5-digit figures and exceeding 2000. The highest possible level of liquidity has its own negative features since it opens the door for non-energy speculators to dominate at the energy paper markets (as happened in oil in mid-2000-ies) which, in turn, increase volatility and decrease predictability of the energy prices. This is good for speculators and financial institutions behind them and is not good for Industrialists.

Option 2: To maintain status-quo? As previously mentioned, dominant type of gas pricing in Europe is the petroleum-products-indexation formulae within Groningen-type LTGEC. Three-fourth of gas pricing basket in the pre-crisis EU import contracts referred to LFO and RFO. Major gas exporters to the EU (Russia, Norway, The Netherlands) has an even higher LFO+RFO ratio – around 90%. When petroleum-products-indexation was established in 1962 in Europe, it has reflected the concept of “replacement value for gas in the end-use”. At that time LFO and RFO have been really presenting replacement fuels for gas in the households (LFO) and in the industry and electricity generation (RFO). Since that time the spectrum of replacement fuels for gas in different sectors has been expanding, but the contractual formulae have been still fixed to LFO and RFO. The 20-30-years-long duration of LTGEC has expanded implementation of these indexation formulae, relevant for the pre-oil-crises 1960's, to the post-oil-crises era. This means that the gap has been increasing between the economic substance of the “replacement value formulae” and its contractual embodiment, especially in the 1970s and beyond, when after the oil shocks both LFO and RFO began to lose their competitive niches in their respective areas, especially RFO which is no more a dominant fuel both in industry and in electricity generation. To maintain status quo in these given circumstances means to further deviate from economic substance of the “replacement value” concept presented in the LTGEC of the Groningen type. The debate on future prospects of oil indexation is today the hottest one, with a number of arguments both in favour and against (see LTGEC *petroleum-products-based price indexation: arguments “in favour” and “against”*).

Proponents of oil indexation argue that it is mostly used now as a hedging instrument since all financial institutions got used to deal with oil-linked

LTGEC petroleum-products-based price indexation:

Arguments “in favour” and “against”

| “In favour” | “Against” |
|---|--|
| It has been worked out in practice for 50 years, thus convenient for users | Its conservation without changes does not correspond to evolution of “replacement value” mechanism within LTGEC |
| It narrows corridor of price fluctuations, increases price predictability, minimizes investment risks | Liquid fuel is displaced from competitive with gas areas of consumption (industry, electricity generation); it ceased to be a replacement fuel for gas, but just a reserve one |
| Convenient tool for financial institutions (hedging) providing debt financing | It withholds gas price below oil parity (price of oil in energy equivalent) |
| Transparent and understandable pricing mechanism (at least for professionals) | It links gas price to highly liquid, but manipulated and unpredictable futures oil (oil derivatives) market |
| Professional, stable and narrow circle of market participants | Confidentiality, thus closed and non-transparent for the public |
| Proposed alternatives (spot/futures) is not better: low liquidity, high possibility for manipulations | Currently: higher contractual prices compared to spot transactions |

derivatives. In these supporters' view, this helps to escape gas price manipulations by the gas actors at the yet non-liquid gas hubs since oil-indexed gas price is linked to price of oil which is developed at the most liquid and global market. However, this argument must be challenged.

Deviation of oil pricing from oil fundamentals link the gas price to the price of commodity which is established mostly by the non-oil speculators as a virtual price with high volatility based on perceptions of global financial players. Secondly, oil price established at the commodities exchanges can be manipulated, for example by the major investment banks who are the key actors at oil derivatives markets (this was proven by the US Congress/Senate's investigations regarding the 2008 oil price developments).

Option 3: To stay with oil-indexation and to reach oil parity. To stay with oil-indexation and to move from long-standing 0.6-0.8 gas-to-oil ■■■

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■■■ price ratio in LTGEC to oil parity (gas-to-oil price ratio equal to 1.0) is the Gazprom's and Gas Exporting Countries Forum's (GECF) stated preferences, presented, inter alia, in few GECF Ministerial Declarations and statements of GECF Secretary General who stated that "...compared to oil, gas price is to be at least 2-3 times higher". There is only one technically possible way to stay within petroleum-products-indexed gas pricing and to reach oil parity – to link gas price almost only to LFO. But although being technically possible (at least theoretically), it is not only violating the "replacement value" concept of gas pricing but, it will be more than difficult to persuade the gas buyers to switch to this new gas pricing formulae leading to the price increase, especially nowadays when they are fighting with Gazprom and other gas exporters, including in the arbitration courts, for price discounts.

Option 4: To stay with indexation and to exceed oil parity? It might be possible to exceed oil parity with indexation pricing principle in case of possible radical change of indexation formulae in the long-term by, say, adding ecological component into it based on generally internationally accepted "polluter pays" principle. Since gas is the cleanest fossil fuel, it can obtain the lowest pre-tax price among its competitors (replacement fuels). In this case the final result might be the one desired by the gas producers/exporters (like Gazprom and/or GECF). It seems that the potential for this kind of development is now seriously delayed due to the failure of the Copenhagen December 2009 Conference on Climate Change, Canada's withdrawal from Kyoto Protocol, etc.

Option 5: Adaptation of indexation in line with historical evolution of NBRV. There are few trends in evolution of LTGEC pricing formula structure in Europe:

- from more simple to more complicated (non-dependent when contractual relations began to be implemented in the respective countries);
- the longer the history of contractual relation between the exporters and importers is, the more liberalized the importer's market is. The more sophisticated the pricing basket within the LTGEC is and the lower

oil-indexation ratio within its pricing formulae is. It starts from 100% oil-indexation in the pioneering contractual structures (pioneering in the EU 1962 original Groningen LTGEC, pioneering in the FSU 2009 Russia-Ukraine LTGEC), it downgraded to 95%

of oil-indexation in least liberalized within the EU Eastern Europe, further decreased to 80% in more liberalized Western Europe, and finally diminished to 30% in the most liberalized UK.

The general trend is evident for me: further away from oil parity through diminishing oil-indexation in Continental Europe during recent 50 years – but in evolutionary, not revolutionary manner. From this author's view, adaptation of current LTGEC with petroleum-products-indexation formulas in line with historical evolution of the NBRV concept is the preferable and most probable scenario of LTGEC pricing formulas changes in Continental Europe.

Should option 5 be chosen, EU market structure should have two competitive segments of gas supplies: long-term supplies (firm contracts to cover main/basic demand of load curve) which should be based on shorter-term LTGEC which should be more flexible in terms of off-taking contractual volumes, pricing formulae and price review rules. Indexation will stay as a gas pricing mechanism but will not be limited to petroleum products only. Long-term access to long-distant transportation capacity for full duration and volume of LTGEC should be provided. The integrated and coordinated throughout the whole EU system of "open season" procedures, as an annually/bi-annually repeated element of 10-year network development plan, should be the core element of matching future demand for gas with adequate availability of transportation infrastructure without its deficit in any given regional zone and entry-exit point.

Second segment - short-term supplies (interruptible contracts to cover additional/semi-peak and peak demand of load curve) - should be based on short-term/spot contracts and spot/exchange pricing established at the regional European – sometimes, hopefully, to become finally liquid - hubs (futures quotations, gas indexes, forward curves).

Under such architecture of the emerging internal EU gas market Commoditization (implementation of the Anglo-Saxon model), which is the main driver of risks & volatility increases, will have only limited and not overall application within the EU. Its competitive niche is to be defined not by administrative decisions of the regulators, but by the competitive choice of the market players. The coexistence of both term contracts (new-type LTGEC) and spot transaction with commodities will provide for the market players their best choice of instruments to mitigate gas price risks: those who need to invest (project financiers) would prefer term contracts, the same as Industrialists (hedgers), pure traders (speculators) will definitely prefer spot/futures trading. Each market participant will have a competitive opportunity to choose its own best effective pricing instrument for its type of transactions to mitigate its type of price risks. ■

EUROPE SHOULD HAVE TWO COMPETITIVE SEGMENTS OF GAS SUPPLIES