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Gazprom and the complexity of the EU gas market: A strategy to define

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Abstract

Confronted with an increasingly competitive market in the European Union and the credible threat of a new entrant, in the form of liquefied natural gas imports from the United States, Gazprom's traditional export strategy is open to question. The company must decide whether it should launch a price war in order passively to adapt to impending competition and its role as a 'residual supplier' to the EU gas market, or should it take advantage of the current price uncertainty.

We shall therefore explore scope for long-term strategic action other than simply a price war. We shall show that Gazprom could be seen as a key player in the EU gas market capable of playing the same role and the same strategy as Saudi Arabia on the oil market.

Key Words : Competition on the EU gas market, strategy of Gazprom on the UE market.

The export strategy of the Russian gas company Gazprom is subject to debate, given the far-reaching changes – substantial drop in oil and gas prices, revolutionary non-conventional energy sources, surplus supply and an increasingly competitive environment – affecting international hydrocarbon markets, including the European Union's gas market. These changes have brought about a situation that is relatively unfavourable to hydrocarbon suppliers. Meanwhile in its home market Gazprom must respond to the strategic behaviour of new competitors, in particular Rosneft and Novatek, both of which intend to market their gas reserves, at home and abroad¹. The Russian gas market has deeply changed in comparison to the 2000s, creating opportunities but also constraints for Gazprom, which used to enjoy a monopoly of transports and exports.

These key evolutions are an incentive for substantial changes in Gazprom's export strategy, particularly with regard to the EU. The latter market absorbs most of its gas exports, amounting to 153 Bcm in 2015 out of a total of about 200 Bcm. Despite the firm's very real determination to diversify into Asia, its strategic goal is still – perhaps surpassing any consideration of revenue – to preserve (or indeed increase) its share of the European market. Over and above any concern for profit, this goal may reflect the strategic goals of the Russian State, Gazprom's main shareholder (Jansen *et al.* 2012; Yang *et al.* 2016).

The question of Gazprom's market share and market power in the EU has also a geopolitic importance, begging the question of whether it is in a position to counter (or delay) the arrival of a new entrant, in the form of US exports of liquefied natural gas produced through large-scale exploitation of shale gas². Such exports could seriously compete with Russian gas and meet the needs of the EU's projected policy of diversifying sources of supply. EU policy explicitly seeks to guard against dependence on Russian imports, seen as accounting for too great a share of the overall total, and more broadly to mitigate the supposedly specific 'Russian risk', particularly since the gas crises between Russia and Ukraine and the subsequent armed conflict between the two countries.

The answer to this question depends to a large extent on the position Gazprom adopts in the European market and how it defines new strategies governing its contractual relations with the Union. The factors determining relations between the EU and Russia with regard to natural gas have given rise to a substantial volume of literature, often contradictory but mainly based on two observations. On the one hand there is considerable inter-dependence between the two blocs with respect to natural gas. On the other hand Gazprom enjoys market power or a dominant position in Europe due to its

¹ It should be borne in mind that although Gazprom still has a monopoly over gas exports conveyed by pipeline, this does not cover LNG. Novatek, thanks to the Yamal project, and Rosneft could start exporting large volumes of LNG or at least compete with Gazprom in this sector.

² Some authors have argued that the large-scale development of non-conventional hydrocarbons in the US represents that a major geopolitical challenge for producers of oil and conventional gas, primarily OPEC and Russia. See Dunn and McClelland, 2013. Importing LNG from the US would be a major diversification strategy for the EU, enabling it to substantially reduce its dependence (Coote, 2016). Others take the opposite view, arguing that such imports would not substantially change Russia's part in supplying the EU (Boersma *et al.*, 2014; Mitrova *et al.*, 2016).

large (30%) share of the EU market (Jansen *et al*, 2011; Sagen and Tsygankova, 2006, 2008). There is now little doubt on the matter of inter-dependence, but the reality of Gazprom's market power is subject to many questions. It is certainly a major supplier of gas to the EU market. Yet, despite its weight, it is not a price maker, as it only enjoys limited market power in the competitive north-west European market. It has consequently had to adapt to the growth of free markets (spot markets and gas hubs) and a decline in demand since 2008 by making more or less substantial changes to its long-term contracts.

The question Gazprom must now settle is whether or not to launch a price war in order passively to adapt to impending competition and its role as a 'residual supplier' to the EU gas market, or alternatively to take advantage of the current price uncertainty. The present article seeks to determine which strategy Gazprom may adopt in its efforts to preserve existing market share. In particular we aim to explore possible long-term strategic action, other than simply defending volume by means of a price war. Is it, for instance, plausible that it might deploy a strategy along similar lines to the one attributed to Saudi Arabia by Sadek Boussena (1994a, b, 2016), which would involve playing on uncertainty about future prices to its own advantage?

Our analysis is organized in the following way. In a first step, we will start by defining the adaptation strategies Gazprom is deploying to restore its competitive position, undermined by changes in the EU gas market. There being no single gas market in the EU, we shall focus our attention on north-western Europe, where the market is more competitive. As yet Gazprom's attempts passively to adapt have mainly involved updating its long-term contracts. In a second step, we shall show how, threatened by potential competition, Gazprom enjoys relative advantages enabling it to adopt an alternative strategy to just a price war. Although it is inevitable (to preserve its market share), the price war is a short-term answer. It would not be the ideal mid and long-term strategy for Gazprom. The other course of action would be to play on uncertainty about future prices to its own advantage.

I – Gazprom forced passively to adapt to changes in European Union's gas market

To cope with changes in the EU gas market and to preserve its market share Gazprom must strike a balance between prices and volume. Initially (2008-12) the firm opted to give priority to prices but, lacking real market power in the key market of north-western Europe³, this behaviour resulted in a substantial drop in market share. Responding to this setback it sought to restore its competitive edge by updating the long-term Take-or-Pay (TOP) contracts which govern most of its sales in Europe.

1.1 Gazprom as a residual supplier on the spot markets of north-western EU

³ Gazprom's market share varies a great deal in the EU, depending on the region. Compared with the total imports of the countries under consideration here, its market share exceeds 60% in the Baltic states (Lithuania, Latvia and Estonia), in some central European countries (Hungary, Czechia, Slovakia), Finland and Greece. But the large markets – Germany, France and Italy – have much lower levels of natural-gas supply concentration than other EU regions, and consequently more diversified sources of supply (Clastres and Locatelli, 2012; Dickel *et al*. 2014).

Competition in the EU gas market, particularly in north-western Europe, has become increasingly stiff, driven by three market liberalization directives (June 1998, June 2003 and the Third Climate and Energy Package of 2009), surplus supply and the diversification policy deployed by the EU. To secure supply the latter has extended its sources of supply by developing substantial regasification capacity. In all the EU's delivery capacity (LNG, gas pipelines) now exceeds 600 Bcm, whereas consumption in 2014 was only 387 Bcm. This supply capacity results from regasification capacity close to 200 Bcm – but with a low utilization rate, circa 32% in 2015 – to which should be added the delivery capacity of gas pipelines from North Africa (65Bcm, utilization rate 36%), Norway (127 Bcm, utilization rate 79%), Russia (244 Bcm, utilization rate 48%) and two interconnectors (35 Bcm)⁴. Such surplus supply capacity has paved the way for a significant competitive fringe which represents a credible threat, with regard to prices, for incumbent EU suppliers, Algeria, Norway and Russia.

The process of liberalizing the European gas industry has led to a hybrid price-formation system, characterized by a dual rationale. The development of spot markets and hubs is leading to the emergence of gas spot prices. There are many spot markets, but only a few have the necessary characteristics (depth and liquidity) to define a marker price (Heather 2012 and 2015). The UK's National Balancing Point (NBP) and the Dutch Title Transfer Facility (TTF) on the north-western Europe carry sufficient weight, in terms of liquidity, to define marker prices, in contrast to all the other spot markets (Petrovich 2013; Heather 2015). These spot prices coexist alongside prices set by long-term TOP contracts. They are the result of a negotiation between sellers and buyers, based on a rationale combining netback and cost-plus approaches. Lastly price variations are governed by an indexation formula based on the price of crude oil and petroleum products. At one stage long-term contracts and price-formation linked to that of oil represented over 90% of gas transactions in the EU. In contrast to day in north-western Europe nearly 90% of trades are based on prices linked in one way or another to those set by gas hubs (International Gas Union 2015).

On the whole the evolutions in the natural-gas market since 2010 and falling oil prices have led to a significant drop in natural gas prices in the EU, both for spot markets and long-term contracts. Due to this hybrid price-formation system the differential between spot-market prices and those in long-term TOP contracts is of prime importance to gas-market players. As a result between 2009 and 2011 prices set by long-term contracts were substantially higher than spot prices (see Graph 1).

**Graph 1: Natural gas price trends in the EU market and on Henry Hub (US)
2008-May 2016, \$/MBtu**

- *Gazprom is not a price maker on the north-west European market but a residual supplier on the European spot markets*

This price differential had a significant impact on Gazprom's export strategy. In 2009-12, on its priority export market (in terms of volume) – north-western Europe – the firm's competitiveness suffered and it lost substantial market share. In 2012 gas exports

⁴ This capacity will soon be supplemented by the Trans-Anatolian pipeline (10 Bcm) and the TAP (10 Bcm), both fed by the Caspian. See Tagliapietra and Zachmann 2016.

to the EU fell by 5%, whereas Norway's increased. So, despite the size of its market share, Gazprom is not a price maker on this market (see Box 1).

Box 1: The limits to the exercise of market power by Gazprom

Several factors act as constraints on the exercise of market power by Gazprom⁵, primarily competitive pressures and the fact that long-term TOP contracts play a dominant role in the contractual structure of its sales. Within the framework of TOP-type contracts Gazprom only has a limited amount of leeway for manipulating prices, constrained by its obligations regarding supply and the price terms in its contracts. The company's market power may bear on the base price P_0 and the price indexation formula written into the contract. Once the contract has been signed Gazprom has little room for manoeuvre, even if the contract provides for price review (for example, it can offer rebates and change the price formulae, cf. 1.2). Furthermore in the indexation formula linked to oil prices in Gazprom contracts, the world price of oil has a more decisive impact on its natural gas prices than variations in the EU gas market. The TOP clauses in long-term contracts also hamper any strategic behaviour bearing on volumes. Suppliers are obliged to guarantee the minimum deliveries stipulated in the contract, limiting their capacity to influence prices by restricting the volume of exports. Here again such strategies are only conceivable for a large or dominant exporter operating in the spot markets. In practice to exercise market power in such a way as to alter natural-gas prices there must be sufficiently liquid spot markets with prices determined by supply and demand. Given the scale of its sales to Europe, Gazprom could be one of the most influential spot-market players, always supposing that it opted to market its natural gas in this way. But it has so far avoided any large-scale intervention on such markets, preferring to secure its sales through long-term contracts.

Gazprom is in the position of a residual supplier, or passive swing producer on the spot markets. In EU hubs, LNG – particularly gas sold by International Oil Companies (IOCs) but also, though less aggressively, by National Oil Companies (NOCs) – is tending to compete with and take the place of, when prices allow, the flexible volumes covered by Gazprom's long-term contracts⁶. Under these circumstances Gazprom is playing the part of a residual supplier to EU hubs (Stockes *et al.* 2015), or in the terms of Stern and Rogers (2014) as the 'buffer or shock-absorber in the new global order'. Whereas in the past, following market liberalization, Russian contracts indexed to oil prices exerted a powerful influence on – perhaps even acting as the main driver for – the price dynamic of gas hubs (Stockes and Spinks, 2016), this is no longer the case, with LNG imports the dominant influence on gas hubs. As a result Gazprom no longer counts as a swing producer, relegating it to a passive role, obliged to align its prices with those set elsewhere on free markets. But gradually, Gazprom tries to adapt to this new context by modifying somewhat its strategy.

1.2 Gazprom's adaptation strategies: updating long-term contracts in response to changes in the EU gas market

⁵ Market power refers to the ability of a company 'to define a price at a level above this competitive level' (Carlton and Perloff, 1998).

⁶ Traditionally the TOP clause covers 85% of annual contracted quantities, but many contract reviews have made it possible to decrease this amount (cf. note 7 for the specific case of Russia).

To restore its competitiveness and win back market share Gazprom has had to adapt its export behaviour to suit the new conditions in the EU gas market, while giving priority to volume rather than prices. Up till now it has mainly deployed passive adaptation strategies which involve revising certain clauses in its long-term TOP contracts, particularly those governing price formulas and delivery flexibility. In its contracts (and discourse) Gazprom has stuck to the principle and overriding approach that gas prices should be indexed to oil prices. But the main purpose of the adjustments it has made has been to realign the prices in its contracts with those on spot markets (see Graph 1).

Gazprom has had to cut prices by agreeing to discounts (estimated at 7% to 10%, Stern 2014) for some of its customers. Furthermore it has in some cases made more lasting changes by adjusting components of the formula, either reducing the base price, or P_0 (which reduces the difference between the price obtained from indexation of TOP contracts and spot-market prices at hubs), or by changing the relative weight of the various petroleum products in price formation and lowering the coefficients allocated to each of these products. As a result the average price of Russian gas fell from \$10.0/MBtu in 2013 to \$9.75/MBtu in 2014. Since July 2014 the substantial fall in oil prices has, through the correlated indexation formulas, led to a drop in the price of Russian gas exports to Europe. On average in 2015 the price of Gazprom exports to Europe was about \$6.17/MBtu (compared with \$14.50/MBtu in 2008). In May 2016 the price of the Russian contract, delivered to the German border was \$3.99/MBtu (Table 1). We may thus conclude that the changes discussed above, combined with the drop in oil prices, had more than halved prices, realigning Gazprom's contract-based prices with those on spot markets, in particular the TTF.

Table 1: Natural gas price of the Russian contract, delivered to the German border 2016, \$/MBtu

In addition Gazprom has tried to make its contract more flexible by adding or changing certain clauses to make more immediate allowance for price variations and respond to the volatile nature of the EU gas market. In particular it seems to have defined shorter periods of time governing price review processes and changed the period affected by backward oil indexation. In some cases greater flexibility on offtake and volumes covered by TOP contracts has been added⁷.

Box 2: Gazprom's position on indexation of gas prices in long-term contracts

Gazprom has always upheld the principle of indexing gas prices to those of oil and petroleum products in its long-term contracts, particularly on the grounds of sharing price and volume-risk between producers and importers. The firm's management have consequently expressed firm opposition to the principle of indexation to natural-gas spot prices, putting forward several arguments to explain their stance. They stress the poor reliability of spot-market prices associated with the baseline hub (Komlev, 2013). In particular they cite the issue of 'illiquidity'⁸, the depth of most EU spot markets. First given the poor liquidity of spot markets

⁷ According to L. Franza (2014), in a contract between ENI and Gazprom, the TOP clause was lowered from 85% to 75%. Henderson and Mitrova (2015, p. 34) cite 70% as the minimum level for TOP.

⁸ The liquidity of a gas hub can be defined as the ratio between the total volume of trade on the hub and the volume of gas consumed in the area served by the hub.

there is good cause to fear manipulation of prices through coordinated agreements between dominant producers. By banking on low growth in gas production and exports, they would be able to push spot-market prices up, a strategy which could not possibly work with conventional TOP contracts (Boussena and Locatelli, 2013). In contrast, indexing such contracts to the price of oil products makes it impossible for a single player to influence prices, and eliminates the incentive to do so.

Second the marker price issue relates directly to that of the price-setting hub that might be suitable as a basis for price-indexation formulas (Stern 2007). For a spot price fixed at a particular hub to become a marker price, the hub must offer, among other attributes, the necessary depth, liquidity and transparency, and consequently be able to attract a significant number of market players (Heather 2012).

There remains the problem of volatile spot prices. One of the arguments generally put forward in favour of continued indexation to oil products is the stability this practice induces.

In the face of the changes in its main export market Gazprom's position in this respect has shifted a little, for it now supports a system of hybrid prices for its exports. A system of this sort combines indexation to oil prices and indexation to gas-hub prices (Burmistrova, 2016). The long-term contracts – on which are based decisions to invest in developing Russia's gas fields and transnational infrastructure – are preserved. The matter of flexibility and therefore adaptation to shifts in the EU market now plays a central role in Gazprom strategy, but it nevertheless still highlights the risks, with regard to the renewal of investments, of excessive price volatility in prices linked to spot markets.

II – Towards scope for more offensive strategies

In the medium-to-long term Gazprom's goal is to preserve its current market share (circa 30%⁹) in the EU. But US exports of LNG to the EU represent a credible threat for Russian gas exports. Substantial volumes could be involved, about 70 Bcm/year in 2020, according to the US Department of Energy (EIA/DOE 2016)¹⁰. In view of the flexible nature of contracts governing US exports of LNG (no final destination clause), the decision to target the European or Asian market would depend on the potential profit (spot price) in either case. In this respect the EU market is increasingly geared up as a residual market for such imports (as a function of price variations in the Asian market and profitability conditions).

These export volumes should be viewed alongside Gazprom's portfolio of long-term contracts with its EU customers. These contracts with Russia represent supply of about 190 Bcm/year¹¹, amounting to more than half (52%) of contractualized volumes in the EU (Cedigaz, 2016). Of the 190 Bcm/year, at least 130 Bcm/year is thought to be subject to TOP obligations (Cornot-Gandolphe, 2016). So, it is the flexible part of

⁹ Gazprom (2016). *Investor Day*. 9 February, www.gazprom.com

¹⁰ By early-2015 40 projects to export LNG to countries not covered by a free trade agreement had been filed with the US DOE. However the substantial drop in gas prices in the three regional markets and the fall in oil prices tend to cast doubt on the profitability and competitiveness of some of them. Only three export projects (Sabine Pass LNG 1, 2, 3; Freeport LNG; Cameron LNG) may be realized by the end of the decade.

¹¹ These volumes should remain fairly steady until 2020, still resulting in deliveries amounting to over 120 Bcm/year in 2025 (Cedigaz, 2016).

contractualized Russian volume which could be replaced, as a priority, on spot markets by imports of US LNG.

In the face of the credible threat of substantial LNG imports from the US flooding the EU market, Gazprom might start by launching a price war to preserve market share, for instance by setting a “limit price strategy” (Benhamad and Percebois, 2014). But it would not be optimal for the company to sustain a long-term price war, which could prove too costly and have a negative impact on revenue for the Russian state, which holds a majority share in Gazprom. To maximize long-term profits would demand a more sophisticated approach, in order not only to preserve market share but also to obtain the best price, when conditions allow, in other words when competition subsides.

2.1 Price war, the first phase in a strategy designed to play on uncertainty

In the short term Gazprom can cope with a fall in prices. Given the comparative advantage it derives from lower production costs, the proximity of markets, amortized infrastructure and excess production and delivery capacity, it can preserve market share and still turn a profit even with lower prices. Though not an end in itself a price war is inevitable, for it constitutes the opening phase of a strategy designed to play on price uncertainty. It is important for the incumbent supplier in order to preserve its market share. But – and this is the key feature of the strategy – this move enables it to issue a price signal likely to become the reference for potential competitors with regard to new projects. The possibility of low prices over a sufficiently long period of time is enough to cast doubt on the return on possible capital-intensive investments, such as LNG plant.

- *Gazprom’s comparative advantages in a price war: cost of supplying gas to Europe*

Gazprom has several comparative advantages, enabling it to wage a successful price war, the first of which is the cost of its gas deliveries to the EU border. The respective costs of the two key competitors – Russian gas exports by pipeline and US LNG exports – will be the decisive factor for their competitiveness in the EU market and, consequently, for the capacity of the two types of supplier to wage a price war. In this respect Gazprom benefits from the proximity of its export markets and existing infrastructure. Furthermore, with excess production and delivery capacity, it can market its gas at the marginal cost of supply to the EU border.

Various estimates have been made of Gazprom’s cost of supplying gas to the EU. On the basis of the estimates made by Henderson and Mitrova (2015), Stokes *et al.* (2015), but also the incomplete figures available from Gazprom (2016), we may put the cost of delivering Russian gas to the German border at about \$3.80/MBtu. This is derived from a marginal production cost at the field estimated as \$0.36/MBtu, to which we must add mineral extraction tax (\$0.35/MBtu), transmission inside Russia (\$0.81/MBtu), transmission via Nord Stream (\$1.20/MBtu) and export duty. In the case of the ‘new gas’ from the Bovanenkovo field (Yamal province), J. Henderson has estimated its break-even price at the EU border to be \$5.5/MBtu over the entire cycle and \$3.5/MBtu on the basis of just operating costs, transport and tax (Rogers, 2015). A key parameter in the calculation is the value of the rouble versus the dollar.

For comparison, the key reference at present in the European context is US LNG exports, which in the medium to long term looks like the most credible rival for Russian gas in the EU market. In this respect the Cheniere Energy (Sabine Pass) sales contract is most instructive about the minimum technical cost of delivering US LNG to Europe¹². Starting from natural gas at Henry Hub priced at \$1.9/MBtu in May 2016 (but variable), we add a liquefaction cost ranging from \$2.25 to \$3/MBtu, a sea transport cost of \$1/MBtu, and a regasification cost of \$0.50/MBtu. This yields a total cost, delivered to the EU of between \$5.7 and \$6.4/MBtu. This price is higher than the delivery cost calculated for Gazprom and the NBP spot price (\$4.3/MBtu in May 2016), higher even than Gazprom's long-term contracts. The drastic fall in oil prices, to which gas prices are indexed in Russian long-term contracts, has brought the price of the Russian contract delivered to the German border to less than \$4/MBtu. According to some studies, liquefaction costs, charged as a fee in Cheniere Energy contracts, may be treated as stranded costs, which would bring the cost of LNG imports from the US down below \$4/MBtu, thus rendering them competitive with Russian imports, with only a slight difference. However there is good reason to question the viability of such a model, which only applies to already completed projects. Even in the latter case the substantial losses likely to be incurred might prompt producers not to export¹³.

To sum up, the three factors determining competition will be variations in Henry-Hub gas prices, variations in the price of crude oil and Gazprom's strategy on pricing and contractual sales. From this point of view, the strategy adopted by Russia may change the competitive picture in Europe and become a determining factor in the volume of LNG exports from the US.

Table 2: Summary of debate on competitiveness of Russian gas and US LNG exports

- *Gazprom's comparative advantages in a price war: surplus production and transport capacity*

In the event of a price war Gazprom enjoys a second advantage in the form of surplus production and transport capacity, with production capacity exceeding sales. The surplus is estimated at between 100 Bcm/year (Drebentsov, 2015; Rogers, 2015) and over 150 Bcm/year by CEO Alexey Miller¹⁴. This is partly due to sluggish demand for gas in Russia and the EU, but also to increasing output by independent Russian gas (Novatek) and oil (Rosneft) companies¹⁵, which sell their production to Russia's domestic market.

¹² This LNG facility is very particular because it has the benefit of existing infrastructure and constrained customers (due to existing commitments reserving capacity, with fees amounting to \$3/MBtu). Subsequent US projects will come at a higher cost.

¹³ According to Wood Mackenzie 50% of US export capacity could be under-used between 2017 and 2020 if Gazprom drops the price of its gas exports in order to preserve market share. 'Wood Mackenzie says up to 50% of US LNG is at risk of shut-in over the next five years.' LNG Industry, 9 March 2016 <http://www.lngindustry.com> (checked 3 June 2016).

¹⁴ Speech by Alexey Miller to the Gazprom annual general meeting, 30 June 2016.

¹⁵ In the medium term, according to J. Henderson (2013), the new players in the Russian gas market have sufficient reserves to produce 350 Bcm by 2020, fed by gas fields where the production costs could be lower than those of Gazprom's new gas fields. This observation is the result of comparing the location of their reserves to that of the new development locations planned by Gazprom. In the specific case of gas

This has led to a supply surplus. Gazprom also owns substantial transmission capacity serving Europe, estimated at 244 Bcm/ year, thanks to three large export routes, via Ukraine, Belarus (Yamal I) and Nord Stream 1 and 2 (to which we may add Blue Stream, under the Black Sea). In comparison to this considerable transmission capacity, exports in 2015 amounted to about 159 Bcm. It should be borne in mind that exports to Ukraine only amounted to 51 Bcm in 2015, due to the political tension (Table 3). The utilization rate of Russian pipelines is now less than 50% (Tagliapietra and Zachmann, 2016).

This excess capacity, both in production and transmission, has two key implications. Firstly Gazprom can adjust output and exports to suit its strategy and shifts in the EU gas market. In particular it can sell sufficiently large volumes on spot markets to weigh on prices, the latter serving as a point of reference for the marginal development cost of LNG, its ultimate competitor. Secondly it is no longer obliged, at least in the medium term, to invest massively in developing new gas fields in order to supply the EU (Lunden *et al.* 2013).

2.2 The second phase of a strategy designed to play on price uncertainty

Sustaining a lengthy price war would not be an optimal strategy for Gazprom, as it would prove too costly in terms of revenue. The gas company would need to adopt a more strategic, more offensive stance, the aim being to discourage investment in additional LNG production capacity for the long term, thus reducing the intensity of competition. It might, for instance, make sense to envisage a strategy similar to the one that Sadek Boussena (2016, 1994a, b) attributed to Saudi Arabia in the oil market, playing on the uncertainty of future prices. In today's partly but not fully liberalized EU gas market, there would be openings, for some time yet, for incumbent suppliers to adopt such a strategy¹⁶.

- *A strategy designed to play on price uncertainty: the need to update long-term contracts*

The strategy based on price uncertainty, as defined by S. Boussena (1994a, b, 2016) with regard to the behaviour of Saudi Arabia, the world's dominant oil supplier, hinges on creating uncertainty about future prices. It aims to avoid a permanent price war, but rather to encourage volatile market prices. This entails accepting, perhaps even stimulating, volatile gas prices. All it needs to do is stop releasing information on prices and costs. Rather than simply launch a price war, defending market share by cutting prices across the board, the dominant supplier can stop releasing enough information for

fields operated by oil companies, profitability mainly hinges on oil production. They can consequently afford to charge less for their gas when competing with Gazprom. Furthermore, given the current crisis, demand for gas inside Russia may only grow slightly.

¹⁶ When moving into a gas market, this strategy is subject to several key conditions. First is important that the market should not be completely globalized and consequently fully competitive, because as things stand no single gas supplier is big enough to influence the entire world market. The second condition is the presence of a dominant player in the relevant market (the EU in the present case). The third (and last) condition concerns the dominant player itself. Much as Saudi Arabia, it must have substantial spare capacity, thanks to which it can freely deploy volume strategies and consequently be perceived as a price-maker (Boussena and Locatelli, 2016).

the needs of potential long-term competitors. The latter need a reference price to assess the profitability of natural-gas or LNG projects. Capital-intensive investments are needed to develop gas capacity, with a long return on investment and aversion to risk.

The short-term cost for incumbent suppliers of delivering gas to the EU and the cost of delivery to the EU border for its main LNG suppliers constitute a price range within which the incumbents will have to define their strategy. Under the present conditions, which are favourable to buyers, the price of gas entering the EU will probably continue to range from \$4 to \$8/MBtu, given that the equivalent price of coal, with which it is competing in the EU market, does not exceed \$4 to \$5/MBtu. With prices potentially varying over a such a wide range the condition of high price volatility, favourable to a strategy playing on price uncertainty, would be fulfilled. All that Gazprom would need to do would be to keep prices down for a while, repeating the operation as need be, in order to contain potential competition from 'remote gas' (such as Australian LNG) and delay the massive influx of US shale gas. A strategy of this sort aims to kill off investment (particularly in expensive projects), thus limiting long-term capacity¹⁷.

But to create the necessary information asymmetry, between dominant producer and competitors, and to make profitable use of it, Gazprom will need to significantly change the rationale underpinning its contracts for exports to the EU. Up till now it has hinged on long-term TOP contracts, an approach which shared volume and price risks between exporter and buyer (Boussena, 1999). In particular it served as an incentive for investment in specific assets (Nicita and Pagano, 2004). The key purpose was to provide the producer-seller with an *ex ante* guarantee, enabling it to anticipate a minimum sales price before launching a project. On the one hand the level of the base price and the variation of prices in the indexation formula stipulated in the long-term contract were sufficient to secure a competitive position with regard to competing energy sources, such as oil or electricity. On the other hand an indexation formula pegged prices variations to oil and petroleum products. Under these conditions it was possible to forecast long-term gas prices, based on assumptions about the price of crude oil. Moreover volatility was limited by indexation formulas based on average prices over a three to nine-month period. Although this did not wholly eliminate any uncertainty as to future price trends, these formulas did make things reasonably predictable, underpinning realistic, long-term price assumptions (Boussena and Locatelli, 2016).

Some studies have concluded that the best strategy for Gazprom would be to put all its sales on the gas hubs (Henderson, 2016). It is certainly not in the interests of a supplier to make its prices foreseeable by way of its contracts and it must adapt its behaviour to suit the now volatile nature of the EU gas market. However this does not entail giving up long-term contracts altogether. Firstly, this type of contract still seems essential to guarantee the completion of the costly investments required to develop new zones of production, such as Yamal province in Russia. Secondly, Russia, Algeria, Qatar and Norway have the advantage of selling from existing facilities, which gives them greater leeway when negotiating new contracts. In the present volatile and uncertain

¹⁷ 'This strategy is manifest in the powerful offensive that Saudi Arabia has been conducting since late-2014 to reduce potential production of 'expensive oil' such as US shale oil or Canadian bituminous sands. This price war is obviously only a temporary measure. Through this cost-learning process Saudi Arabia hopes to determine the real costs of expensive oil. In the next phase it may up its prices to a show a satisfactory return for the dominant supplier, while killing off costly large-scale projects' (Boussena, 2016a).

environment, there is may be another solution, which would be just as promising for Gazprom and the EU's incumbent suppliers, namely to make their long-term contracts more flexible. The optimal solution for incumbent suppliers would therefore be a mix of two marketing techniques, retaining long-term contracts and, within the bounds of the law, opportunistically unloading surplus supply on liberalized markets when it suits them.

Gazprom has undoubtedly decided to diversify its contractual approaches, introducing greater flexibility, in response to the volatility and uncertainty of the EU gas market. Regarding this point, we should note changes in the Gazprom's policy concerning the principle of price indexation in the long-term contracts. Gazprom is now in favour of a hybrid system (see Box 1). It is also experimenting new ways of selling its natural gas. It may sell small quantities of gas in spot markets (17 Bcm in 2015, or 8% of its sales; Henderson 2016). In a further illustration of its determination to adapt to a changing EU gas market, the firm has experimented a new sales mechanism in 2015, auctioning almost 4 Bcm of gas at delivery points in Germany. The same approach is likely to be adopted in 2016 for volumes of about 6 Bcm. This could signal a significant increase in its sales to free markets and the start of a shift in strategy¹⁸. Does this mean that it is seeking to exert greater influence over prices?

Concerning this type of strategy, it is important to take into account variations in the price of gas on the Russian market. If it increases, securing adequate profitability, the company might be tempted to shoulder the cost of future price uncertainty in the EU market and trade at marginal prices for limited periods of time. It is essential to bear in mind that Gazprom's strategy with regard to the EU has never been wholly independent of its strategy in the home market, which accounts for most of its sales (Boussena and Locatelli 2011).

- *The limits to such a strategy*

Despite the many cards Gazprom holds, various factors may prevent the firm from fully realizing a strategy comparable to the one deployed by Saudi Arabia in the oil market. Firstly Gazprom is not a swing producer, rather a residual supplier (or a passive swing producer), witness its lack of market power. Unlike Saudi Arabia in the oil market, it is not up to Russia to decide whether or not to act as the supplier of last resort. It is confined to a role determined by its buyers. The challenge for Gazprom would be to stop acting as a residual supplier and become an active swing producer.

Secondly, Gazprom's surplus export capacity is not really a spare capacity, as in the case of Saudi Arabia. It is not the result of corporate strategy, rather the fruit of past decisions on investment, which over-estimated demand for natural gas at home and in the EU market. On the basis of its miscalculation of future demand Gazprom developed new gas fields. Furthermore the increasing strength of independent firms in the Russian gas market, capable of competing with Gazprom on substantial segments of its market, has contributed to over-production. Gazprom's surplus export capacity is nevertheless an advantage.

¹⁸ Ultimately Gazprom aims to auction 10% of its exports. Rather than taking their place such sales would supplement long-term contracts.

Finally although Gazprom has various strengths (size, substantial reserves, low production costs) enabling it to adopt a long-term strategic position and an offensive stance, its dominant shareholder, the Russian state (51 %), has other objectives and may seriously constrain its strategy. Maximizing revenue is not Gazprom's sole objective, it must also maximize rent paid to the state. And the two are not necessarily correlated. What level of resource rent do Russian authorities expect and require? It's an important question for Gazprom. Its place in the Russian economy and the importance of hydrocarbon revenue for balancing the budget are major constraints on the company. The State can also be tempted to use gas resources to exert geopolitical pressure.

2.3 Diversification of export markets: a long-term strategy

Looking ahead to the long term, the response by Gazprom, with the backing of the Russian state, to the constraints upon its action in the EU market, may also involve diversifying its export markets. On the one hand such a policy would enable it to compensate for lower profitability on the EU market, thus opening the way for possible strategic action in this arena. On the other hand – and this is an essential point given the ownership structure of the company – diversification would secure sufficient fiscal revenue for the Russian state while fulfilling the latter's more geopolitical objectives. In particular, one of the reasons for diversifying, for Gazprom and its main shareholder, would be to reduce dependence on the EU market currently deemed to be too great. So, whereas the European Union puts the emphasis on securing supply, the Russian Federation responds by citing the security of demand for its gas.

In this context the contract signed in May 2014 between China National Petroleum Corporation and Gazprom covering delivery of 38Bcm of natural gas may be seen as a strategic agreement, in so far as it is the first concrete sign of the Russian firm's diversification strategy (Locatelli 2015)¹⁹. The Asian markets particularly concerned by this strategy of alternative markets are Japan, China and South Korea. Many projects have been cited, though some of them stand little chance of coming of being realized in the immediate future. They reflect two options, one is to export LNG, the other is to export natural gas by pipeline. The new strategy also involves specific institutional mechanisms – long-term bilateral contracts between state-owned companies, backed by bank loans, asset swaps and investment. Some of these mechanisms are innovative, witness the Gazprom-CNPC agreement to build gas power stations in China. As such these agreements do not only obey a competitive rationale (albeit far from absent) but clearly seek to secure demand for Russian output, while securing supply to China.

However redirecting gas exports to Asia can only be part of a long-term strategy, which requires Russia to develop new centres of production in Eastern Siberia and build extensive gas pipeline infrastructure, all of which entails substantial financial commitments. In the past this diversification strategy has been hampered by lower profitability of exports to China. This argument is less true today given the sharp drop in prices in Europe. However, for China, the future of its gas demand – depending on its climate policy, economic growth and reform of its gas industry – remains the key uncertainty weighing the development of large-scale trade between Russia and China.

¹⁹ A second contract, currently being negotiated, could concern natural gas exports from Russia to China exceeding 68Bcm by 2030, accounting for nearly 20% of Chinese gas consumption (Jaffe *et al*, 2015). Furthermore, according to Russia's long-term energy strategy for 2020-30, Asia could absorb 19% to 20% of its gas exports by 2030.

Until such time as the European Union's gas market is completely liberalized, we may conclude that Gazprom is in a position to deploy strategy designed to create uncertainty about the price of natural gas, rather than simply starting a price war. Thanks to several comparative advantages, primarily the size of its reserves, the proximity of its current markets, its spare capacity, it remains a key player in the EU gas market.

However to successfully play on future price uncertainty it will need to make significant changes to its policy on exports, in particular contracting. In a general way more competitive, volatile gas markets make it necessary to adapt long-term contracts, the very contracts which have enabled the development of stable, mature gas markets in the EU. In Europe and in Asia, for reasons of security, buyers and sellers still need such contracts, in order to support the capital-intensive investments that characterize the gas industry. But a review of the rationale behind clauses governing duration, obligations, flexibility, TOP and price formulas is essential. For producers one of the priorities will be to reduce, as far as possible, the predictability induced by the current form of these contracts. Various options are available, but they belong to a different topic which could only be addressed in the light of concrete negotiations in the context of a new, more liberalized world gas market.

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Tables

Table 1: Natural gas price of the Russian contract, delivered to the German border 2016, \$/MBtu

December 2015	January 2016	February 2016	March 2016	April 2016	May 2016
5.81	5.09	4.79	4.09	4.02	3.99

Source : Index Mundi, several years

Table 2: Summary of debate on competitiveness of Russian gas and US LNG exports

Estimate of marginal cost of delivering Russian gas to EU border	\$3.8/MBtu
Estimate of cost of delivering US LNG exports to the EU, priced at \$1.9/MBtu at Henry Hub	\$5.7-\$6.4/MBtu
Estimate of marginal delivery cost of US LNG exports to the EU, priced at \$1.9/MBtu at Henry Hub	\$3.4/MBtu
Price of gas in Russian long-term contracts on the German border, May 2016	\$3.99/MBtu
NBP spot price, May 2016	\$4.3/ MBtu

Source: Own calculs

Table 3: Natural gas export capacity from Russia to Europe

Pipelines	Capacity, Bcm
Nord Stream 1	27.5
Nord Stream 2	27.5
Yamal-Europe	33.0
Ukraine	140.0
Blue Stream	16.0
Total	244.0

Source: Russia's European export options, International Gas Report, n° 785, 2 November 2015

Graph 1: Natural gas price trends in the EU market and on Henry Hub (US) 2008-May 2016, \$/MBtu

