ELSEVIER

Energy Policy. Vol. 25, No. 2, pp. 125–133. 1997

Printed in Great Britain
0301-4215/97 $17.00 + 0.00

PII:S0301-4215(96)00110-3

Viewpoint

Russian natural gas policy and its possible effects on European gas markets

Oliver Quast and Catherine Locatelli
Institute d'Economie et de Politique de l'Energie, IEPE-BP47X-38040, Grenoble, Cedex 09, France

There is a growing perception among Western European gas experts that Russia has developed a considerable gas surplus – the Russian gas bubble. Thus, the question clearly arises how much gas is available for export and how much gas, over the next 15 to 20 years, can the Russian quasi-monopolist Gazprom market in Western Europe. We consider that Gazprom's export strategy mirrors the approach of Russia's natural gas policy towards the Western European market. In this paper, we will focus on the characteristics of Gazprom's export strategy, its underlying logic, and its impact on Western European gas markets. A quantitative approach to managing natural gas flows characterizes Russian natural gas policy towards domestic as well as foreign markets. The Russian government's way of managing and regulating Gazprom clearly has an influence on the company's export strategy, as indicated by the importance of gas exports for the Russian gas industry's, and indeed the whole country's, financial situation. As a consequence of Gazprom's export strategy, the Russian gas company faces today a price quantity dilemma. Gazprom's problem is to place as much gas as possible in the growing Western European gas market, without destroying downstream gas prices. We argue that Gazprom has adopted a market share expansion and downstream vertical integration strategy, aimed at capturing a part of the downstream gas rent. Although this strategy appears to have initiated a form of gas to gas competition in a number of European consumer markets, this strategy is not based on an aggressive price policy. However, in order to live up to its ambitions, there is a chance that Gazprom will have to somewhat relax traditional contract clauses, such as contract length, indexation terms and take or pay conditions. © 1997 Published by Elsevier Science Ltd
Keywords: Gazprom's export policy; Natural gas export; Gas prices

Gazprom Russia's quasi-monopolist gas company, is governed by an internal logic very different from what Western economists would call a profit maximizing and efficiency enhancing approach. This has considerable consequences on how Western companies and analysts should understand Gazprom's export strategy towards occidental European markets.

Russian gas industry reform and Gazprom privatization

The Russian government has made considerable efforts to transform its former centrally planned economy and top-down command system into a structure similar to that of a Western market economy. In 1992 a Presidential decree changed Gazprom's legal status from a unit belonging to the government's gas ministry to a corporate holding structure.

First steps to privatize Gazprom were taken in 1993. The Gazprom holding was created by transforming the regional production associations into private companies, the shares of which are held by Gazprom. The Gazprom holding also owns the Russian transport company Transgaz and supervises the only Russian gas export company.

As of today, RAO Gazprom is owned by the government (40%), Gazprom employees (15%), inhabitants from the Yamals-Nenets district (5.2%), the Gazprom board of directors (10%) and the Russian population (28.7%).

The privatization of the remaining government stake has been delayed for several years.

Despite the widely publicized privatization efforts, Gazprom's internal logic has been rather immune to profound changes. Gazprom officials still see Gazprom's role not only in promoting the exploration, transport and sale of natural gas, but in a wider context of state welfare. As far as Russia's domestic economy is concerned, Gazprom's strategy aims at stabilizing (or at least not further destabilizing) prices, inflation and industrial

relationships. In this context, it may be significant that, over the last few years, Gazprom has steadily diversified into neighbouring economic sectors. Gazprom has recently taken shareholdings in various other activities such as agriculture, tourism and financial institutions (Sorokin *et al.*, 1995).

Gazprom's internal logic

Although the overall set-up of the holding company is similar to that of private companies in the West, the Russian state retained important rights for itself and thus preserves a high degree of influence on Gazprom activities. For example, the company is not free to determine its own pricing policy. Domestic prices must currently be approved by the ministry of economics.[1] Many former officials from the ministry of the gas industry have remained in senior Gazprom positions after its privatization.

This may explain in part why, in spite of the gas industry's reorganization programme, Russian gas policy and Gazprom's strategy in particular do not, so far, show many signs of taking criteria such as economic efficiency or profitability seriously (Kryukov, Moe, 1996). Other reasons for the lack of Western-style market relationships and the maintenance of a quantitative approach towards the natural gas system's management involve the following considerations.

The insufficient development of monetary relationships within the gas market is one reason for the lack of efficient market transactions. Barter trade is still a common industry practice. The inability or unwillingness of more than half of all gas customers to pay their bills is part of this problem.

While Gazprom has been trying to improve its billing record, not much progress has been made. The industry practices of exchanging goods instead of money and of setting consumption quotas to then allocate and distribute gas accordingly still prevail. Old habits take time to die. The breaking up of the former Soviet Union and the establishment of several states with diverging interests and their own financial problems do not improve the situation. Maximizing domestic revenues was not high on the agenda in the gas industry of the former Soviet Union, whereas increasing production and sales volumes were. According to Gazprom, Russian gas demand has not only been depressed by falling industrial production, but also by the non-payment of gas bills. During 1994 53% of gas delivered to Russian consumers has not been paid for. Extrapolation puts this on par with a quantity of 186 billion metres of gas not paid for in 1994.

Maintaining the use of consumption quotas for attributing gas domestically is another reason for the lack of efficient market transactions. The consumption quotas are negotiated between Gazprom and its customers. However, the key variable for determining the quota is not the customer's predicted consumption, but the available pipeline capacity of the grid serving him. Supply cuts can occur at times not anticipated by the sales agreement. Gazprom's internal understanding of the domestic gas business has not yet truly shifted from supplying gas to selling it. Contractual procedures have changed very little from those employed in a centrally planned economy (Locatelli, 1996).

According to Shleifer (1994), effective control structures would enforce the property rights structure that has been created when privatizing Gazprom, which in turn would theoretically result in furthering efficient transactions within the gas industry. However, the quest for market transactions within the Russian gas industry would have to involve a thorough evaluation of Gazprom's current costs and assets – a difficult task with often non-existent monetary relationships.

Gazprom's holding organization and hard currency revenue maximization

Gazprom's current holding structure is not really in contradiction with maintaining a quantitative approach of managing Russia's gas industry. Centralizing and integrating all major gas industry transactions and gas industry workforce under the holding umbrella actually helps to pursue Russia's welfare objectives. Centralization and the internalization of transactions represent a means for ensuring Gazprom's supplies and market outlets. The company still pursues multi-billion dollar supply projects like the Yamal peninsula development plan, ignoring profitability criteria but keeping Gazprom's large workforce employed. At the same time, the integrated and centralized organization structure makes it possible to avoid the problem of defining new inter-industry relationships at a time when whole industrial sectors are collapsing.

The constraints put on the determination of domestic prices as well as the disastrous domestic billing situation do not help raise sufficient funds that could subsequently be invested in the maintenance of transport and production capacities. This leaves the onus of raising funds on Gazprom's export market. Compared with the pre-privatization era, the strategy of mainly raising hard currency funds by exporting natural gas has not changed very much.

By 1993 the government and Gazprom had agreed to establish two stabilization funds fed by Gazprom's export revenues. One is intended to further domestic investment, the other is aimed at the 'stabilization and development' of Gazprom. The funds are a means for keeping investment decisions centralized (Le Houerou, 1995). Both funds provide for about 76% of all Gazprom investments (Sorokin *et al.*, 1995).

The funds provide the Russian government as well as Gazprom with an incentive to further gas exports to Western Europe. In order to split export revenues into money flows that will both aliment the gas industry's investment funds and the government budget, Gazprom and the Russian government use a negotiable allocation percentage. Natural gas exports thus constitute a viable, stable and long-term source of income for both Gazprom and the Russian government.

Multi-billion dollar investments in future production projects allow Gazprom to push the investment funds' revenue percentage up and thereby maximize hard currency revenues that will be attributed to Russia's gas industry. Thus, Gazprom has an incentive to schedule extra-large investment projects rather than to planify lower cost maintenance investments. Russia's domestic gas policy and Gazprom's internal logic provide the explanation why Russia's domestic production policy and Gazprom's export strategy are mainly concerned with volumes and not with profitability considerations.

The Russian gas bubble strikes surface

The supply side of the Russian supply and demand equation has recently been dominated by continuously falling gas production in Russia. However, the consumption of domestic power generators and industry fell even faster, creating an ever bigger surplus of gas available for export.

The Russian gas supply surplus

The figures show a continuous decrease of production, that peaked at about 600 bil-

[1]This situation is likely to change in the future, since a recent presidential decree foresees the establishment of an energy industry regulatory agency which would obtain responsibility for regulating energy monopolies, including their pricing policy.

Table 1 The emergence of the Russian gas supply surplus

	1991	1992	1993	1994	2000	2010
Production capacity	600	600	600	600	600	600
Production	600	598	578	568	580	600–695
Imports	15	2	9	4		
Domestic consumption	379	370	358	328	300	330–375
Storage withdrawal	27	28	26	27		
Storage addition	29	30	38	44		
Storage balance	2	2	12	18		
Exports to CIS	84	84	74	74	75	75
Exports to Europe	98	93	94	99	130	140–190
Pipeline fuel	56	56	54	54	55	55
Gas bubble (shortfall)	0	2	22	32	40	0–(95)

Source: Stern (1995); differences with the figures cited by Stern are due to figure adjustments and rounding.

lion cubic meters (bcm) in 1991 and declined to 567 bcm in 1994. A first estimate puts the production figure for 1995 at 555 bcm, down by another 2.1% (Stern, 1995).

More interesting are the domestic consumption figures. Total internal consumption fell some 13.5% compared to its 1991 high level and thus decreased faster than production was shut down. The decrease of natural gas use in power generation and in industrial consumption could not be offset by the rise in residential and municipal consumption. Residential gas demand has increased by 40% over the period from 1990 to 1994, but it started from such a low base that it makes only a minor difference for the overall consumption figures.

The storage figures are also significant: the increasing lack of a market forced Gazprom to put as much gas into storage as was physically possible. Without the record storage addition in 1994, the year's production figure would have been correspondingly smaller. With a view to the availability of storage capacity, it seems unlikely that the additions can continue on such a high level.

Gazprom deliveries to CIS markets have fallen from 1990 to 1993. It is all the more surprising that deliveries to these markets were stable in 1994, given that about half of all the gas delivered was not paid for.

However, compared with Gazprom's production capacity, there was already a substantial production surplus in 1994. As Stern points out, the gas bubble would have been even bigger when taking the storage balance into account.

According to the scenario presented above, the gas supply surplus can be assumed to rise to about 40 bcm by the year 2000. Table 1 shows that the gas supply surplus will continue to increase despite the fact that exports to Europe are expanding. Depending on the development of domestic demand in Russia, the gas surplus would then decline until 2010. At this point, Gazprom could experience a potential deficit that would have to be filled with production capacity expansions after about 2005. The emerging Russian gas supply surplus is important, since it shows Gazprom's ability to market substantial additional volumes at only marginal extra costs.

Export capacities

Given both the enormous gas resources that are available from the emerging gas bubble and the even larger volumes that can be developed at low extra costs from either deeper geological horizons or the numerous satellite fields in the existing Yamburg and Orengoy regions, production capacity is not a constraint on Gazprom exports. How much gas can actually be delivered into Western Europe over the next twenty years will depend on how much transport capacity will be available.

Gazprom's export plans are, however, more ambitious than simply exporting the gas surplus. The table indicates that, compared with 1994, Russian gas exports to Europe (Central and Western Europe) could rise by some 30 bcm by the turn of the century, and by 40 to 90 bcm by 2010. Pauwels (1994) estimates that Russian exports to Western Europe will increase by an extra 66.6 bcm by the year 2010. Given the capacity constraint on the newly constructed Belarus–Poland gas pipeline corridor, about 15 bcm out of this extra export volume would have to be delivered via the existing 'Transgaz' system. In order to carry an extra 15 bcm pa, the system would need renovation and the installation of additional compressor stations.

In 1993 Gazprom signed a contract with Poland stipulating the annual delivery of 67 bcm to the European border. Construction of the Polish pipelines that will carry the Russian gas into Europe have started more than a year ago and will be finished this year. In October 1996 initial gas quantities are expected to flow through the new export corridor, by-passing the Ukraine and to be delivered at the German – Polish border at Frankfurt am Oder. According to the Russian–Polish agreement, after accounting for the gas that will be delivered into Poland, export volumes to Western Europe via the Belarus–Poland corridor will rise from 0.4 bcm in 1996 to 38.4 bcm in 2000, before reaching its plateau volume of 51.7 bcm in 2004.

Exporting an extra 50 bcm pa by the year 2010 would maintain Gazprom's market share in supplying Western European markets at the current level. The fact that Gazprom actually intends to export substantial volumes on top of the Yamal gas project means that Gazprom's export strategy aims at a market share expansion. Gazprom officials have repeatedly been quoted as saying that Russia intends to double its export capacity to Europe by the year 2010. This would mean that Russia would have to increase its export transport capacity by some 100 bcm. However, Pauwels (1994) considers an export capacity expansion of about 66 bcm per year to be more likely.

Exporting gas via the new Belarus–Poland corridor is part of a bigger scheme to develop and export gas from the Yamal peninsula. The 'Yamal project' comprises four different development stages, of which only the fourth will include the development of new gas resources from the giant Bovanenko field on the Peninsula. The development of each section of the new pipeline corridor is entirely independent from the other ones. The development of each section of the Yamal pipelines will depend on additional gas production from existing resources in already developed regions, such as the Nadym-Pur-Taz region, where the required infrastructure is already in place (*Gas Matters*, 1994; Stern, 1995).

As a result, over the first years, no gas from the Yamal peninsula will physically be produced or delivered via the Yamal pipelines. The first Yamal gas, produced from the giant Bovanenko and most southern field on the Yamal peninsula, is not expected to be delivered before 2000.

European gas markets meet Gazprom's export strategy

Confronting the European gas suppliers ambitions with recent demand forecasts yields a surprising result: although Western European demand is scheduled to rise substantially, there seem to be more than sufficient volumes of gas available that would satisfy rising demand at reasonable

Table 2 Demand forecast for Western Europe (Bcm)

1995	2010	Source
350	425–450	Ruhrgas (1996)
	476	Pauwels (1994)
	436	IEA (1995a)
	400–460	Snam (1995)

Source: Pauwels (1994).

Table 3 Incremental production and import capacities in 2010

Country of origin	BCM
Western European production	
Italy	5
UK	7
Norway	
Troll contracts to Emden and Zeebrugge	10.2
Haltenbanken to Emden and Zeebrugge	15
Total Norway	25.2
Russia	
Extra volume via renovated Transgas system	14.6
Supplements from Nadym-Pur-Taz and Yamburg regions	27
New Yamal gas	25
Total Russia	66.6
Algeria	
LNG contracts	4.8
Transmed	6
Algeria–Spain, western pipeline	4.5
Total Algeria	15.3
Total imports from traditional sources	119.1
New import sources	
Qatar	20
Lybia	10
Egypt	5
Iran	20
Turkmenistan–Turkey–Italy	10
Nigeria	3.7
Venezuela	8
Total import possibilities from new sources	76.7
Grand total, additional import capacity	195.8

Source: Pauwels (1994).

costs. Europe's gas suppliers are faced with an obvious dilemma. Due to the enormous Russian gas volumes that could be made available at relatively low extra costs, it is not entirely clear that the ensuing gas border prices will allow to develop higher cost supply projects. Due to Gazprom's export strategy there is a possibility that the current situation of a European buyer's market situation will persist. This could potentially jeopardize high cost supply projects.

For the purpose of our analysis we have ignored any major institutional changes that may arise due to regulatory activity at the EU or national level. There is, however, a possibility that in the wake of the recently agreed power industry liberalization directive, the EU council of energy ministers will decide, within a reasonable lapse of time, on a phased-in approach towards gas industry liberalization. But we think it unlikely that, over the next 5 to 10 years, smaller industrial and commercial gas consumers will become generally eligible for any form of workable and transparent third party access to gas transport pipelines and distribution networks.

A number of European gas markets has recently experienced a market led development towards more gas to gas competition (as opposed to the traditional inter-fuel competition) at the level of large industrial user and wholesalers. This restricted form of gas to gas competition has developed during the last years although no workable EU regulation on gas market competition was in place. We therefore assume that a future gas directive along the lines of recent electricity directive would not considerably alter current gas industry developments in major EU gas markets such as the UK, Germany or Italy. However, a future gas directive that includes a workable form of TPA regulation will possibly extend the current gas to gas competition development to more restrictive countries such as France or Spain.

The Western European gas market: demand picture

Most demand analyses agree that Western European natural gas demand will rise by some 30% over the next 15 years. An important variable for natural gas projections is demand for electric power generation, which is difficult to predict. For example, whereas Ruhrgas believes that there is no real potential for very much additional natural gas fired power generation capacity in Germany, other analysts foresee a major increase of gas fired power generation in this country. It is the power generation variable which explains the wide gap in recent demand forecasts.

Assuming an average yearly consumption of about 445 to 475 bcm and domestic production at current levels, this would mean that Western European gas companies would need to identify, negotiate and bring on line some extra 95 to 125 bcm of import capacity by the year 2010 (see Table 2).

Western Europe's need for rising imports, above already contracted volumes, will be mainly met by a number of traditional suppliers. However, new supply projects are being considered and could account for important volumes by 2010. Considerable additional supplies into Europe are possible and largely sufficient to satisfy increasing demand (see Table 3). The key question will be at what prices these new supplies can be brought to Western European borders.

Delivered gas costs

The question in which fields and regions the gas will actually be developed, and what export routes will be chosen, is a key variable for trying to determine the cost and price of delivered Russian gas at Western European import points.

As far as Russia is concerned, the numerous combinations of pipeline construction, renovation of existing systems and development of different satellite fields and/or deeper horizons in traditional production areas naturally yield very diverging cost and price estimates for the quantities of gas that will be delivered to Western Europe. However, experts' best estimates for the 'Yamal Gas' delivered at Frankfurt–Oder is for a price of about US$4 per million Btu (British thermal units).[2] Delivered costs would be between US$2.00 and US$2.20 per MBtu (Stern, 1995). Pauwel's delivered border cost estimate for additional volumes flowing from the Nadyr-Pur-Taz and Yamburg regions via the Belarus-Poland pipeline corridor is US$3.22 (1993) per MBtu. According to him, gas produced on the Yamal peninsula could costs around 3.37 $/Mbtu when delivered at Frankfurt am Oder.

If enough gas import capacities can be constructed, the question of selling huge additional Russian gas volumes into the Western European market will depend on

[2]Mr Detharding, the Wintershall chairman, has been reported as saying that the gas would be priced at US$3.60/MBtu.

Table 4 Gazprom joint venture trading houses

Country	Trading house	JV partner	Activity
Austria	Gas und Warenhandelsgesellschaft mbH (GWH)	OMV	
Bulgaria	JSC Top Energy	Bulgargaz	Planning of an oil pipeline crossing Bulgaria
Finland	Gasum Oy	Neste	Extending the pipline carrying Russian gas from Finland to Sweden Development of both markets, particularly in the high value residential sector
France	FRA Gaz	Gaz de France	
Germany	WIEH	Wintershall/BASF	Gas sales in Central Europe
	Wingas	Wintershall/BASF	Gas sales, pipeline construction and system management in Ger many
	Zarubezhgas-Erdgashandel GmbH		Import and capital participations
	Ditgas	Daimler-Benz	Development of NGV
Greece	JSC Prometheus Gas	DEPA	
Hungary	JSC Panrusgas	MOL, Mineralimpex, Interprocom, DKG East	Import and sale of gas
Italy	Promgas SpA	SNAM	Import and sale of gas
	JV Volta	Edison	Import and sale of gas
Poland	Gas Trading	PGNiG	Import and sale of gas
	JSC Europol Gaz	PGNiG	Construction of the Polish part of the Yamal pipeline
Serbia	Progress Gas Trading		
Slovenia	Tagdem	Petrol	
UK	Interconnector	British Gas and other companies	

Source: *Gas Matters* (various years) and other sources.

Gazprom's pricing policy. In such a 'buyer's market' situation, a few observations concerning other European suppliers than Russia are useful (cited costs according to Pauwels, 1994):

(1) Western European gas costs are about US$1.10 per MBtu;
(2) Algerian gas is highly competitive, and its delivery cost at the European border is about US$1.20/MBtu or, in the case of LNG, about US$2.00/MBtu;
(3) Norwegian Troll gas will be delivered to Emden and Zeebrugge at a cost of around US$2.10/MBtu. Haltenbanken gas could be delivered at around US$3.10/MBtu;
(4) with a view to the pertaining over-supply situation in the UK, gas from the continental shelf will certainly be competitively priced when sold into the continental market;
(5) Libyan gas costs could be about US$2.70 per million Btu and Nigerian gas deliveries would cost about US$2.97/MBtu. Qatar gas costs are estimated at about US$3.30/MBtu.

Taking this gas cost situation into account, it is reasonable to expect that the quantities of gas involved will more easily find new contractual outlets, than huge quantities of Russian gas from the Yamal penisula at superior cost. However, the existence of a sizeable oversupply of gas in the Russian market suggests that large volumes of Russian gas from lower cost and largely amortized production sites could be moved westwards at low marginal costs – if sufficient transport capacity can be put into place. We conclude from this supply picture that the current buyers' market situation will pertain. This makes it difficult for Gazprom to define a strategy that, at the same time, maximizes its hard currency revenues and increases its Western European market share for Yamal project development and the Gazprom/BASF joint venture pipeline system.

Gazprom's potential strategies towards the Western European market

With view to the market conditions described above, Gazprom appears to have the choice of at least two strategies in order to fulfil its export ambitions. It can remain a traditional supplier and deliver its new gas quantities at Western European border points. In order to do so, the gas would have to be competitively priced. Due to the advantageous negotiating power of potential buyers in the current market situation, Gazprom would have to sacrifice a slice of its producer gas rent. However, Gazprom officials have a long-standing experience in negotiating gas export contracts with Western European gas companies. The sacrifice of part of the producer margin would not seem a very attractive solution to somebody aiming at maximizing its hard currency revenues.

The second solution consists in vertical integration. In a buyers' market it may be advantageous to move downstream in the gas value chain and recoup some of the gas rent that has been lost upstream. Adopting such a strategy would mean that Gazprom enters into joint venture agreements and then sells its gas to its commercial partners in consumer countries. They in turn will try and place the gas in high value market segments. Downstream revenues would then be shared and passed on to Gazprom in line with joint venture percentages and profit sharing agreements.

The observation of Gazprom's recent activities in the Western European market tells us that this second strategy appears more attractive to Gazprom officials than the 'traditional supplier' strategy. Over the last few years, Gazprom has formed a large number of joint ventures in various Western (and Eastern) European countries (*Gas Matters*, 1995). The partnerships can be divided in two categories, according to its strategic aim: Gazprom has set up a large number of trading houses and joint venture companies (JVC), aimed at expanding its market presence in consumer countries (see Table 4). The cooperation between these trading houses and Gazprom is in many cases more extensive than simply gaining a share of the existing market by pushing gas exports. They are also set up in order to develop markets so far unreached by natural gas. Ditgas in Germany may serve as an example. Ditgas is a Gazprom joint venture with Daimler–Benz supposedly aimed at the joint development of natural gas vehicles. The German exemple has been followed in Italy, where Gazprom established a joint venture with Edison (Volta) in order to place incremental volumes of Russian gas.

A second category of partnership concerns scientific and technical cooperation. Gazprom has set up a number of cooperation agreements with major Western companies. Many of these companies are purely suppliers of equipment, others may be promoted to commercial partners. Whatever the type of the partnership – joint stock company, trading house or cooperation agreement – Gazprom has put itself in a situation to gain first hand information on Western European markets. This in itself represents an important competitive edge when negotiating new gas

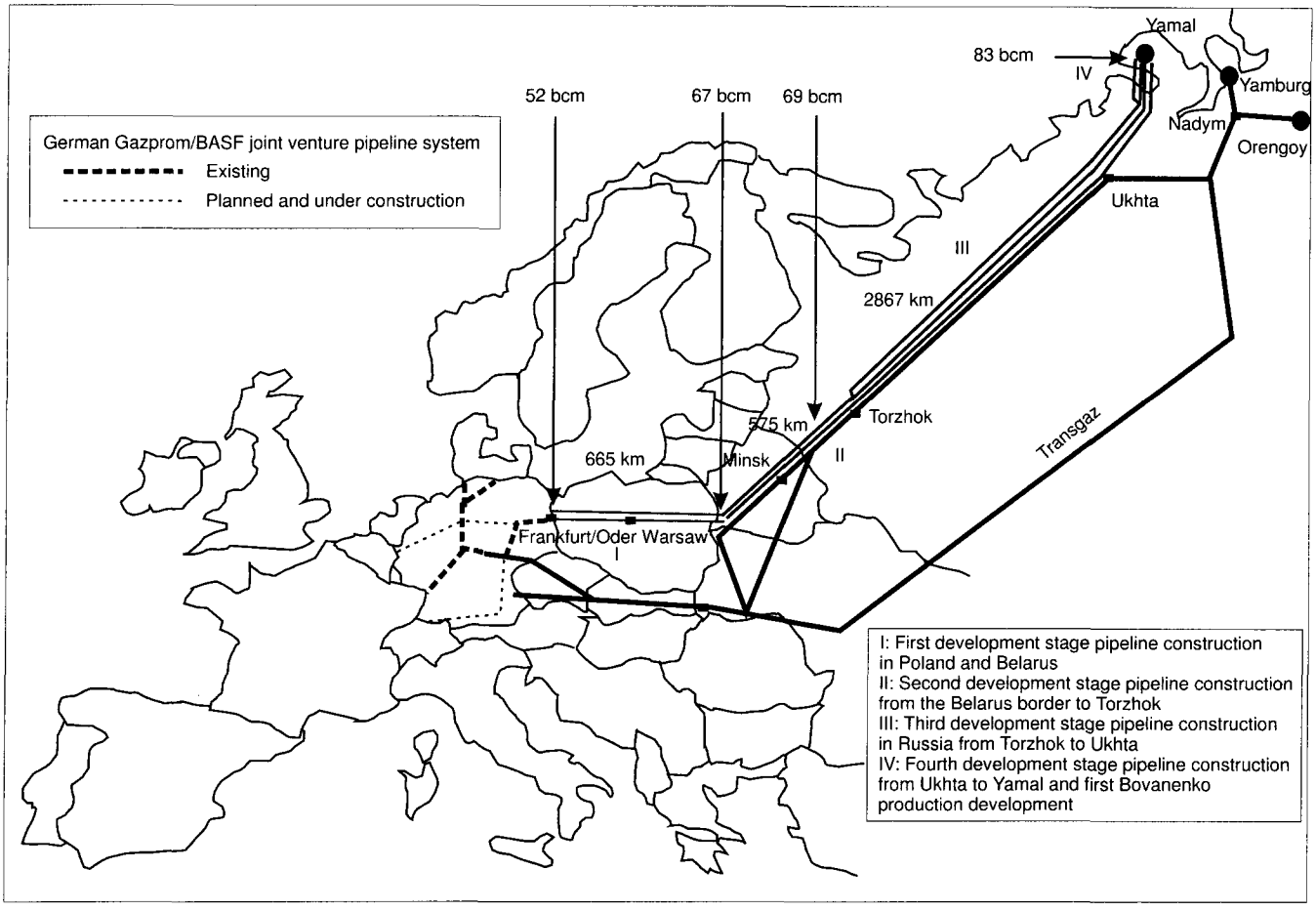

Figure 1 Yamal project development stages and the Gazprom/BASF joint venture pipeline system in Germany

petitive edge when negotiating new gas supplies into these markets.

In the case of Germany, the traditional supplier strategy has been merged with Gazprom's efforts to move some of its gas activities downstream. Gazprom therefore tries to contract now, that is, before the actual completion of the Belarus–Poland export pipeline, a maximum of its newly created supply capacity under long-term contracts. This solution corresponds to the usual and traditional European gas industry response to high capital investments in production and transport facilities, representing sunk costs. This solution enables long-term planning and ensures stable revenues (Estrada *et al.*, 1995). However, the gas will not necessarily be sold at border delivery points. Using the newly created joint venture pipelines could move the gas further into core of Europe's major gas consuming regions.

In 1989 Wintershall, a 100% subsidiary of chemical giant BASF, announced it would build in a major new pipeline system in Germany together with Gazprom (see Figure 1). The pipeline scheme has subsequently been enlarged and today includes the Midal, Stegal, Wedal and Jagal pipelines as well as the Rehden storage site. This strategic move allowed Gazprom to market Russian gas directly in Germany, and gain a more direct market access to other gas importing countries. The Gazprom/Wintershall pipeline system connects directly to the Dutch, Belgium, French, Switzerland and Austrian gas grids and provides access to all major Western European gas consuming countries.

This strategic move downstream enabled Gazprom to cut out German intermediaries and sell directly to regional distributors and large industrial clients. Given the higher sales price level in this market segment, the BASF/Gazprom joint venture was able to capture some of the gas rent that formerly was entirely attributed to German intermediary wholesale companies like Ruhrgas, BEB etc.

So far gas has been placed with Wingas and WIEH, Gazprom's German trading house joint-ventures. A small quantity of 0.6 bcm has recently been sold to VNG and EWE in the East-German market. Dutch Gasunie has signed a contract for annual supplies of 4 bcm, with deliveries starting shortly after the turn of the century with 1 bcm and rising gradually to a plateau. However, these modest sales volumes could rise further within a relatively short laps of time. Wintershall is said to be in negotiations with consumer countries at the end of its planned Jagal pipeline, the German part of the Yamal export project. Possible destinations could be France, Spain, Austria, Switzerland or Italy. The French electricity monopolist EDF is rumoured to be worried about the Russian gas surplus spilling into France.

The advantages of a vertical integration strategy, which involves moving activity downstream and setting up joint venture companies, include the following considerations.

(1) Where extra gas sales are involved, this strategy allows to participate in the

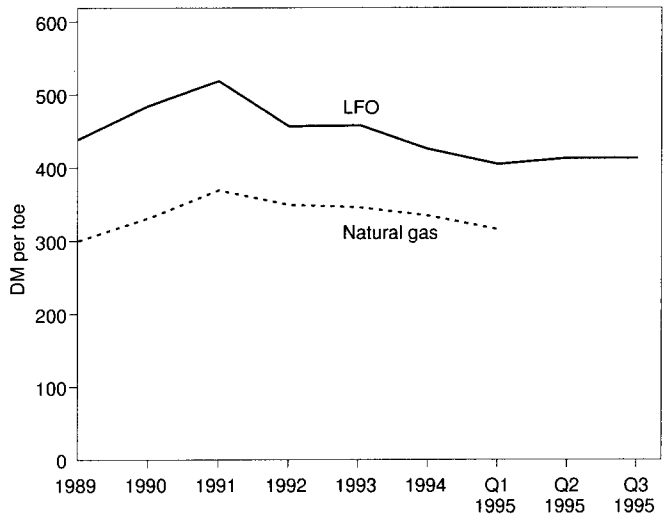

Figure 2 The German average industrial gas price compared to the average industrial LFO price
Source: IEA (1995b).

downstream rent. This could eventually compensate for an eventual decline in upstream margins.

(2) Excluding former intermediaries from the gas supply chain and thereby cutting gas supply cost means that Gazprom and its customers can share the benefits from the reduced number of intermediaries.

(3) The downstream vertical integration strategy opens up possibilities for even further downstream integration into natural gas application activities (electricity generation, fertilizer production etc).

(4) The strategy puts Gazprom into a position from which it can exploit country specific regulation in order to place supplementary gas volumes (Germany may be a good example, where regulation allowed the Gazprom/BASF joint venture to construct its own pipelines in order to gain access to new clients).

(5) The stategy allows to creat flexibility gains through direct consultations with customers: as the customers' demand is increasingly specialized and calls for ever more custom made services, it is advantageous for Gazprom to negotiate more directly with potential clients. The gains from providing these services are best exploited if Gazprom moves part of its activity downstream.

In the long run, downstream integration allows gaining influence on the slowly developing gas to gas competition in the Western European market. In the case of Germany, the strategy allowed building an own pipeline network. Due to the ensuing more direct negociations with potential German customers, Gazprom was able to cut out the transport margin for transport services that so far has been delivered by the traditional pipeline owners. The construction of the Jagal and Wedal pipelines as part of the 'Yamal' gas export scheme allows the Gazprom/BASF joint venture to directly negotiate gas supplies to France and Switzerland. Distrigaz of Belgium will transport additional Russian gas supplies into the UK, should this become necessary once the UK gas surplus fades away.

Impact of Gazprom's market share expansion strategy on the Western European gas market

The Russian policy of maximizing its European gas market share creates an obvious dilemma for Gazprom. With a view to the imminent oversupply situation, it is questionable how much of the Russian gas can be placed in the Western European market without somewhat relaxing traditional gas supply clauses such as take or pay, make-up, indexation formulas and contract length. The problem for Gazprom then is to propose advantageous contractual terms without letting market conditions and the gas price slip out of hand. Ever more flexible supply contracts in an oversupply situation could ultimately lead to the creation of a somewhat informal, but nevertheless existing wholesale spot market. The ensuing gas to gas competition would create downward pressure on gas prices and would possibly jeopardize further high-cost multi-billion dollar European supply projects.

An intensifying gas to gas competition on a wholesale level i.e. between gas volumes aimed at the Western European market and flowing from different supply sources, seems a very real possibility. Intensifying gas to gas competition would eventually materialize in a wholesale spot market. The coexistence of traditional long-term supply contracts and a somewhat informal spot market on a wholesale level could eventually put European border gas prices under pressure. Traditionally, border gas prices are stipulated by long-term supply contract indexation clauses that link the gas price to those of competing fuels. A wholesale spot market would necessitate a new form of indexation that will assure that 'spot prices' of short-term contracts do not run out of line with long-term indexed border prices. This would mean that, in the future, traditional supply indexation clauses will have to include up to a certain degree prices that are determined at the wholesale spot market.

In this context, the Belgium Distrigaz has repeatedly hinted at the possibility that there may be free transport capacity on the Interconnector, once the pipeline between the UK market and the continent has been completed. There may be sufficient UK gas arriving on the continent via the Interconnector in order to place it on a short term (that is, less than about one year contracts) basis, at prices that may be partly indexed to the UK spot price level.

Another hint towards an intensifying gas to gas competition on a wholesale level has recently been given by the Dutch Gasunie. Being traditionally the swing gas supplier for the European market, the company showed some innovative drive, when it announced that it intends to offer 'transit, quality conversions, storage ... technical support and backup services' to a customer 'in need of capacity at economically acceptable conditions' (*Gas Matters*, 1996). The formulation strangely recalls North American hub services, even if there is a clear lack of price and contract condition transparency in European markets. The statement is part of an announcement saying that, after the turn of the century, Gasunie will buy 4 bcm of Russian gas pa, to be delivered at Oude Statenzyl. The delivery point is part of the Dutch German Emden area.

The Emden area already physically re-

ties, blending stations for high and low calorific gas, arrival points of Norwegian, Dutch, UK (Markham) and now Russian gas. The Emden area concentrates a number of wholesale customers such as Ruhrgas, EWE, and Wingas. It is also the starting point for Norwegian gas transiting into Belgium, the Netherlands and France. There is a real possibility that, in a potential oversupply situation, the physical concentration of (the perhaps somewhat unbundled or individualized) services, import and export pipelines, and four major European gas suppliers will result in an intensifying gas to gas competition on a wholesale level.

Limiting gas to gas competition

It is desirable for Gazprom to place as much gas as possible in today's given market situation, without letting gas prices slip to a level that could potentially endanger mega- projects like the Yamal peninsula development. As Gazprom's downstream integration and market share expansion strategy resulted in increasing gas to gas competiton, and since increasing gas to gas competition would, in the longer term erode the downstream gas rent, Gazprom has an interest in not letting gas to gas competition slip out of hand.

The result of Gazprom's strategic move into the German market has increased gas to gas competition in the German wholesale segment of the gas value chain (see Figure 2). However, so far Wintershall has managed not to destroy end user price levels (this excludes competition for a few big, mostly chemical companies). End user industrial prices fell over the last few years, but this change in prices can be attributed to gas price indexation clauses to heavy and light fuel oil in end user gas contracts. Although some gas companies claim that there is an ever intensifying German gas to gas competition, in reality this effect has mainly been vertically limited to the wholesale segment.

When looking at the recent Wintershall sales agreements in the wholesale segment, it becomes clear that the Gazprom/BASF joint venture has been equally successful in limiting further competition geographically.

Based on bilateral contracts between distributors, Germany has traditionally been divided in closed sales regions (demarcations). Wintershall's sale of major gas volumes to regional distributors has recently been accompanied by demarcation agreements with the respective buyer. The Wintershall trading houses WIEH and Wingas thereby agreed not to directly compete with the respective distributor's gas deliveries to final consumers in eastern Germany (demarcation agreement with VNG, excluding Berlin), in a large part of the highly industrialized Ruhr area and possibly most of the south-western state of Baden-Württemberg.

The benefits of limiting competition geographically and to a certain level in the gas value chain are obvious. While the BASF/Gazprom joint venture is able to propose advantageous price and contract conditions in the wholesale segment, the resulting price level still allows them to capture enough of the gas rent to finance the highly capital intensive pipeline system. Would gas to gas competition have been extended to the final consumer price level, the entire gas supply chain would have come under substantial price pressure, thereby reducing the gas rent as a whole. The current Wintershall/Gazprom strategy allows, while accepting some reduction of the gas rent, to simply redistribute the rent within the supply chain, the beneficiary being the Gazprom/BASF joint venture. The fact that the joint venture broke even on its operations in 1995, despite substantial investments amounting to some 4.4 billion DM over a period of only 5 years, underlines the validity of the current Gazprom export policy (Quast, 1996).

The example taken refers, of course, to the particular German gas market environment. The consequences of Russia's market share maximizing and integration strategy on gas markets beyond Germany will become increasingly clear once more sales contracts have been signed with other Western European gas companies. However, the Italian example, involving the Gazprom/Edison joint venture Volta, makes equally clear that the impact of Gazprom's downstream integration and market share expansion strategy is not limited to the German market. As we have mentioned, further Yamal gas sales contracts may become a reality this year.

Gazprom's export strategy is mainly influenced by two variables: internal company regulations and the more general Russian economic environment. These two variables result in a single and unique strategy – the maximization of natural gas production without taking efficiency and profitability considerations too much into account. The combination of this strategy with a clear decrease in Russian domestic gas consumption means that Russia has currently considerable amounts of gas available for export. This situation is unlikely to change over the next fifteen years.

As a consequence of Gazprom's organization and internal economic regulation, a quantitative approach to managing natural gas flows characterizes Russia's natural gas policy. Considering this strategy, at one hand, and the gas supply ambitions of Europe's other traditional and potential natural gas suppliers at the other hand, it is clear that the potential supplies into the European gas market will largely suffice to satisfy its increasing demand. Which supplier will place most of its gas in Europe's increasing gas market will be decided by their capacity to deliver the gas to the Western European delivery points at reasonable costs.

Due to Gazprom's downstream integration and market share expansion strategy, an intensifying gas to gas competition at the European gas industry's wholesale level appears to be a real possibility. In this respect, Gaprom's strategy will be important. Until now, Gazprom has developped a unique strategy towards exporting gas to Western European markets i.e. setting up a large number of trading houses and joint ventures. The strategy nevertheless creates the need to limit price competition in order to ensure more stable revenues.

With a view to the explained rent considerations, the authors consider the possibility of Gazprom deliberately extending gas to gas competition to the entire final consumer (i.e. industrial client) sector as unlikely. While Gazprom may not be able to control developments in the wholesale segment, where gas to gas competition could spread rapidly, the impact on end user prices in the medium term, can be assumed to be limited. Access of big industrial clients to direct gas deliveries would probably need an institutionalized spot market (as opposed to the developing informal one), where access and transport rights are subject to price transparency regulation.

Acknowledgement

An earlier version of this paper has been presented at the Ener network seminar 'Natural Gas Market in Europe' in Petten, Netherlands, June 1996.

References

AIE-OCDE (1995a). *Natural Gas Security Study* Paris.

AIE-OCDE (1995b). *Energy Prices and Taxes* Paris.

Bergmann, B. (1996). Ruhrgas, Russian gas in Western Europe: the potential for growth. *Petroleum Economist* May.

Dispenza, D. (1995) SNAM: Europe's need for gas imports destined to grow. *Oil and Gas Journal* March.

Estrada, J., Moe, A. and Martisen, K. D. (1995). *The Development of European Gas Market: Environmental, Economic and Political Perspectives.* John Wiley.

Gas Matters (1994). Russian realism gives new twist to Yamal. June.

Gas Matters (1995). Gazprom grows its European network.

Gas Matters (1996). Gazprom sales to Gasunie.

Komarov, Y. (1995). Wingas and the European gas market. *Natural Gas, Trade and Investement Opportunities in Russia and the CIS.* The Royal Institute of International Affairs, PIW.

Kryukov, V. and Moe, A. (1996). *The New Russian Corporatism? A Case Study of Gazprom.* Post-Soviet Forum, The Royal Institute of International Affairs.

Le Houerou, Ph. (1995). *Investment Policy in Russia.* Studies of Economics in Transformation, The World Bank, Washington, DC.

Locatelli, C. (1996). *The Organizational Structures of the Russian Hydrocarbon Sector: More from Old Regulations than from Market Mechanisms.* Global Energy Transitions, 19th IAEE International Conference, Budapest 27–30 May.

Pauwels, J. P. (1994). *Géopolitique de l'approvisionnement énergétique de l'Union européenne au XXIe siècle.* Bruyant Bruxelles.

Quast, O. (1996). *L'évolution et l'introduction de la concurrence dans l'industrie gazière.* Thèse de L'Université Pierre Mendès France-IEPE, Grenoble, forthcoming.

Shleifer, A. (1994). Establishing property rights. *Proceedings of The World Bank Annual Conference on Development Economics.*

Sorokin, I., Estrin, V. and Wilson, J. (1995). *Natural gas Industry of Russia: Diagnostic Review and Discussion of Policy Issues.* Prepared for the Ministry of Economy of the Russian Federation, Programme on Natural Monopolies.

Stern, J. (1995). *The Russian Gas 'Bubble': Consequences for European Gas Markets.* The Royal Institute of International Affairs.