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**Research Report**

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# Security of Gas Supply

## Four Political Challenges under the Spotlight

*Kirsten Westphal*

**In February 2012 cuts in Russian gas deliveries led to shortfalls in south-western Germany, reviving old worries about security of supply. Delivery systems demonstrated less resilience than they had during the Russian/Ukrainian gas dispute of 2009 when Ukraine stopped supplies completely for a time. The lack of resilience is partly a function of the current sensitive transitional phase in the gas sector, so the market alone is unlikely to ensure security of supply. Political action is required both in the domestic market and in external relations.**

An extreme cold snap in Europe and Russia at the beginning of February 2012 caused demand for natural gas to spike across the continent. Despite significantly increased consumption, Russia's Gazprom cut supplies to Germany by 10 to 35 percent and a capacity bottleneck south of the major MEGAL pipeline restricted gas supplies to south-western Germany. Network operators there responded by restricting supplies to customers with interruptible contracts, as they are entitled to do under the German Energy Industry Act if network stability is at risk. At least three gas-fired power stations were affected by this measure. This connection to the electricity sector gave the situation a whole new quality, as shutting down power stations brought the electricity grid close to a blackout.

Whereas Italy, Poland and Greece declared major supply disruptions under the EU directive on security of gas supply,

Germany was largely able to deal with the shortfall using market-based measures, above all by withdrawing gas from storage facilities. Nonetheless, the incident exposed conspicuous vulnerabilities that require analysis and explanation.

### The End of an Era

To understand present developments in the European gas markets we must first take a look at the history. For three decades the German gas sector was characterised by long-term supply relationships, above all with the Soviet Union and later Russia. The Soviet Union first began supplying gas to Germany in 1973 under the "pipes for gas" deal, which was an important pillar of Chancellor Willy Brandt's Ostpolitik and rapprochement with the Soviet Union. The arrangement was designed for stability and mutual benefit: Soviet gas for Mannesmann

pipes, financed by Deutsche Bank and guaranteed by Hermes credit insurance.

At the heart of the gas relationship were long-term oil-indexed delivery contracts concluded for 20, 25 or 30 years, including an obligation to purchase at least 75 to 85 percent of the named quantity. These “take-or-pay” clauses represented a counterweight to the supplier’s duty to produce and allowed the two parties to share the risks between them. The producer bore the price risk, the importer the risk of failing to sell the full quantity. The contracts included provisions for adapting prices to changing market conditions at regular intervals.

Oil-indexing followed the principle of basing gas prices on those for competing alternatives. The long-term contracts included mathematical formulae tying prices to those for other fuels used for heating and industrial purposes (heavy and light fuel oil and coal) in such a way as to ensure that gas was always competitive by keeping its price below that of competing fuels. This allowed gas to increase its market share, and supplies expanded as the market grew.

These arrangements produced close, indeed partially symbiotic, and very stable business relations between Russia’s Gazprom and Germany’s Ruhrgas. Indeed, in 1990 Gazprom entered a strategic alliance with BASF Wintershall that extended along the entire value chain. The German partners used close business relations with Gazprom to consolidate their market positions.

In the mid-2000s it was package deals and asset swaps that attracted public attention, especially in the context of the agreement to build the Nord Stream pipeline through the Baltic Sea. In the process, Wintershall and E.ON Ruhrgas became involved in gas and gas-condensate production in western Siberia while Gazprom expanded its transport, trading and distribution activities in Germany.

The Russians pushed asset swaps as a vehicle for building a common energy space with the EU, but vertically integrated

business alliances covering all stages from production to final distribution contradicted the spirit and principles of the competitive open market the EU had been striving for since the late 1990s.

On the other hand, business relations oriented on mutual advantage created a dependable long-term perspective as the basis for German-Russian energy relations. The advantage of linking gas prices to those for competing fuels was that the producer was unable to influence this mechanism. The system of long-term contracts also left little opportunity for tacit price coordination by a producer oligopoly, because they tied producers for the duration of the contracts. The downside was market intransparency and “monopoly” prices, where consumers in Germany paid a premium for security of supply. Ultimately the companies involved had to ensure reliable supplies in order to maintain their market-dominating positions.

### **All Change in the Internal Market**

The first EU gas market directive was adopted in June 1998, the second in June 2003, and the third internal energy market package in July 2009. They have led to many fundamental changes. Today, German consumers can choose among different suppliers, and national regulatory agencies have come into being (in Germany the Bundesnetzagentur, or Federal Network Agency). Independent transmission system operators have been created to separate transport networks from production and distribution (“unbundling” vertically integrated gas companies).

The transmission infrastructure has thus become a kind of public transport medium (“common carrier”) that is supposed to offer all market participants unhindered third-party access to a virtual trading place. In order to achieve this, the market dominance of the big players has been curtailed, forcing the formerly vertically integrated companies to relinquish their erstwhile pipeline networks. This also meant dis-

mantling the system of long-term contracts, because the contractual obligation to purchase 75 to 85 percent of a named quantity left neither necessity nor incentive for competition or diversification. Today, market participants pay only a fee for use of the transmission network between entry and exit point. Regional markets are thus delineated by entry and exit points, while prices are set in a virtual trading exchange.

The move towards spot markets and futures trading is fundamental. Germany succeeded in merging 19 regional markets within the space of a few years, leaving just two by 2011 (NetConnect Germany and Gaspool). Fourteen transmission system operators are active in these two areas.

Further sales of transmission infrastructure are also foreseeable, as well as takeovers, for infrastructure promises small but reliable regulated profits. The crux is that new investment is needed in networks originally configured for long-term import and supply arrangements, as well as new network and storage capacity, as networks must keep spare capacity for potential competitors. At the same time there is a discrepancy between amortisation periods of 55 years and supply contracts whose duration has fallen from 25 to 35 years to more like 15 today. Actors from outside the sector such as insurers and pension funds have entered as investors, reckoning with reliable returns.

Competition has intensified in all parts of the process, increasing the number of commercial contacts and driving up transaction costs. This will above all, like in the oil sector, lead to increasing volatility which is economically costly and opens up space for speculation. Short-term thinking is colonising what used to be a long-term business and hampering the realisation of long-term projects such as opening up new gas fields and building new infrastructure and pipelines. Moreover, coordination costs are higher and more banks and financial institutions are involved. To that extent there is a danger of repercussions of the financial crisis being felt in the energy

sector. The advantage of course is that new market participants bring an interest in new supply channels and thus function as a motor for diversification.

The year 2009 was a turning point, triggered by a gas glut caused by diversion of liquefied natural gas (LNG) in the course of the U.S. shale-gas-boom plus a fall in demand because of recession. With supplies available from other sources and via new transport channels the gas trade boomed, giving a welcome spur to market reorganisation. The gas glut and the resulting low prices also functioned as an important driver for the establishment and expansion of spot markets and for a doubling of Europe's LNG import capacities. LNG represents one quarter of the EU-27's total imports, and has promoted diversification.

Experts estimate that in Germany 5 to 15 percent of gas is traded on the spot markets. But interestingly, the actual sources have changed little since the late 1990s. Germany's top supplier remains Russia (Gazprom), with 33 percent in 2010, followed by Norway (28 percent), the Netherlands (21 percent), domestic producers (11 percent) and other countries. Production within Europe is falling. This underscores the need for greater diversification. Yet, the persistent supply mix also demonstrates that diversification is currently occurring at the – albeit economically relevant – margin. In this situation of transition there are four central challenges.

### **Challenge 1: System Responsibility**

A system that was once managed within a single vertically integrated company is today segmented, fragmented and dependent on the interaction of many. Previously, communication and decisions concerning the integrated system remained under one roof and information about shortages rarely reached the public.

Vertical integration and “control” were based on a systemic understanding of the gas industry conceived for managing the

interaction of import, transport, storage, distribution and interruption. That kind of systemic control is lacking today, with information flows and above all intervention possibilities much more strongly segmented. Companies no longer possess an intrinsic interest in the functioning of the system as a whole; that is now the role of the Federal Network Agency.

In this context of change actors are primarily interested in optimising their own situation and business. In a market environment this leads them to strive for greater efficiency within their own segment. The flip side is the loss of redundancy and spare capacity in the supply system that would offer a fall-back in the event of crisis.

### **Challenge 2: Power Shifts**

The power relationship between domestic importers and their foreign suppliers has shifted to the benefit of the latter – even though this is actually a buyer's market. This phenomenon is apparent in most EU member-states, but especially pronounced in Germany. Unlike other EU states, where “national champions” with state participation (used to) dominate the entire demand-side chain, the pre-reform German gas market was organised in three stages: In the first stage large corporations (which were also active in producing and/or importing gas) supplied gas to regional wholesalers and major distributors. These in turn, in the second stage, supplied “downstream” regional and local distributors (municipal gas works), which in the third stage finally supplied the consumers.

The aggregation of the required volumes occurred at the transitions between the stages. But in the old gas world the German market was divided into many regions with monopoly distribution concessions. Exclusive concessions and demarcations were abolished in April 1998 and replaced with long-term downstream contracts that largely adopted the conditions of the long-

term import contracts. In 2006 the Federal Cartel Office restricted supply contract volumes in this market segment.

The 2009 gas glut, which at first glance would appear to have created a buyers' paradise, has caused great difficulties for German gas importers like Ruhrgas and VNG, with their long-term oil-indexed contracts. While they remained trapped in expensive long-term contracts with minimum take-or-pay clauses, their downstream markets fell away as their customers were often able to purchase gas cheaper on the spot markets. As a consequence importers ended up offering their long-term gas on the exchanges. Paradoxically, the (former) backbone of the German gas sector is in crisis despite enjoying a plentiful supply.

The magnitude of the shift at the international level is seen in the negotiations over oil-indexed price formulas in long-term contracts. In view of the new market situation importers have been trying since 2010 to renegotiate prices with the producers. In some cases arbitration has begun. For a long time the big gas suppliers showed little willingness to compromise, reflecting their position of strength in terms of dominating the market, setting the rules and controlling the game. This represents a lasting shift in relative power. Big exporters like Gazprom are dealing with smaller partners with much smaller market capitalisation and less leverage.

### **Challenge 3: Aggregation**

The aggregation of larger gas volumes for the German and European markets has become more complicated. The Southern Corridor project supplies a prime example of how it is becoming ever more difficult for smaller actors with smaller market capitalisation to diversify their supply channels in the present murky market environment. The business tactic of allowing long-term contracts to expire may also come to reduce the quantities available in the market. Rational decisions of one actor

may be disadvantageous for the market as a whole.

It is by no means certain that Europe's gas supply will remain plentiful in the medium and long term. The big question is whether gas will be available as required, in sufficient quantity, at cost-efficient prices and exactly where it is needed. Here the long-term nature of investment decisions plays a role. The decisive factors are market attractiveness, existing infrastructure and stable demand. Sufficient natural gas is available to cover current rates of demand for the next 250 years – but only if unconventional sources are included. The latter are widely distributed worldwide, while Russia, Iran, Qatar, the United Arab Emirates and Turkmenistan together possess more than two thirds of the world's reserves of conventional gas.

The question is, whether the favourable “buyers’ market” described above will last. Thinking anti-cyclically also means asking the strategic question whether and to what extent the big exporters will remain dependent on the European market. Asia promises significant growth rates, whereas Europe is competing from a position of dwindling global market share.

That is also the logical consequence of the decarbonisation strategy Germany has chosen to pursue. If harmful climate emissions are to be reduced by at least 80 percent by 2050, gas will be reduced to the niche role of a “transitional fuel”, creating a situation of hitherto unknown demand insecurity. Scenarios prepared by the Federal Network Agency for 2022 vary considerably, putting the decline in gas demand between 3 and 19 percent. The interaction between expected demand and security of supply in a long-term high-investment industry like the gas business should on no account be dismissed. Only if demand is calculable will necessary investment be made in gas fields and infrastructure – accordingly orientated on the markets of the future. This increased demand insecurity puts a brake on necessary diversification processes and under-

mines relationships with traditional producers.

#### **Challenge 4:**

##### **Russia, Primus inter Pares**

If Russian gas supplies are of systemic importance, must the shortages of February 2012 be read as a portent of doom? The answer is not entirely simple. We know that Gazprom was unable to provide contracted volumes. But after a relatively mild winter Russia was itself affected by extreme cold from the end of January, with temperatures eight to eleven degrees below average for days at a time. At the same time German (and European) importers were demanding maximum supplies not only to meet weather-induced demand but also to exploit price reductions, volume discounts and penalties due if delivery problems occur. One must also concede that European importers have been trying since 2008/2009 to negotiate quantity and price reductions in their long-term contracts. The sudden spike in demand followed a long phase of falling demand and exposed the inertia of the system.

Closer examination of the data reveals that Russia responded selectively, and in fact increased supplies to Turkey. After Germany and Ukraine, Turkey is Russia's third-biggest European customer with about 20 billion cubic metres, and is of strategic importance for Russia's gas policy in south-eastern Europe. Turkey only recently agreed to allow the South Stream gas pipeline to be laid in its territorial waters in the Black Sea.

Russia has invested more in the construction of strategic pipelines than in its own infrastructure or storage capacity. The lack of the latter during the cold spell in January and February was felt especially strongly because Russia cut its imports from Turkmenistan after demand in Europe slumped in 2009. An explosion on the CAC pipeline, whose cause is a matter of speculation and rumour, came at just the right time for Gazprom, with delays

completing repairs allowing it to pass the brunt of falling demand on to Turkmenistan. When the pipeline came back on stream new contracts specified that Gazprom would purchase only one third of the former annual quantity of about 42 billion cubic metres (2006 and 2007) from Turkmenistan.

Gazprom has many facets: It is a rational commercial company with a strategic and (geo)political presence in the Southern Corridor project, in relations to the transit countries Belarus and Ukraine, and in the former Comecon markets. On the other hand, mobilisation of state resources and interaction between company and Russian politics must be expected not only in those fields but also within Russia itself. The elections and associated protests have increased the pressure on the Russian leadership both to modernise the country and keep the clientele on which its power rests happy without exacerbating social tensions. International energy prices are an important barometer of the Kremlin's possibilities.

Furthermore, conditions surrounding Gazprom are anything but transparent, with the state owning a controlling stake of more than 50 percent. Cases of close entanglement of Russian politicians with Gazprom or its subsidiaries regularly come to light, most recently in March 2012. The company is thus pulled in different directions by long-term investment needs, short-term profit motives, and interests more concerned with the preservation of state power.

Gazprom's special position is based on supplying the internal market at favourable prices and in return paying little in the way of taxes. There is a long-smouldering conflict over medium-term plans to raise domestic gas prices to international levels, with the Russian government rejecting new price rises in March 2012 – but increasing taxes on natural gas extraction by 61 percent.

The rapid processes of change in the Russian gas market are often overlooked. Gazprom is a central actor in the electricity

market and the “gasification of eastern Siberia” is signed and sealed. Between 2006 and 2010 domestic gas consumption increased at an annual average of 7 percent. The Russian government criticised Gazprom unusually sharply in March 2012 for falling behind its development plan for storage capacity and gas production. Production from the three biggest gas fields in western Siberia has already peaked and the gas transmission network requires maintenance and repairs. The urgently needed modernisation of its fixed assets will require considerable additional investment that cannot be generated even by a steep increase in gas and electricity prices (which is not on the cards anyway).

Foreseeable changes and problems in the Russian gas market could also affect export quantities and strategies. If prices remain regulated and the gas sector expands apace, gas consumption within Russia will continue to increase; but if domestic prices rise to match export prices gas exports will lose their strategic importance for Gazprom. In the latter case energy efficiency will become even more urgent. The Russian and European gas markets are more interdependent than ever.

This situation of postponed long-term investment, short-term power-political interests, individual profit-seeking and increasing domestic demand is not unique to Russia, but applies even more so in the Arab world and Iran.

### **No Way Back ... But What Way Forward?**

The German gas market is in a sensitive transitional phase. The outlined situation leaves no alternative to further integration of European gas markets. How far and fast integration will proceed remains to be seen, because both of the following can be observed: there is progress in merging and connecting markets and exchanges, but also renationalisation tendencies. The political discussion about contingency reserves and emergency stocks as well as

risk management in the gas sector needs a fresh start without old baggage.

*Long-term investment decisions.* Security of supply cuts both ways. Gas producers have a good case when they call for security of demand. The necessary transformation of the energy supply involves a high degree of systemic and politically induced uncertainty. The gas market, which was long orientated on growth, must now react more flexibly to uncertain demand trends and ensure long-term security in a context of falling consumption. Even if gas, as a fossil fuel, is only used during a transition period, it remains a long-term business requiring stable relations. That presupposes a long-term perspective that, in times of systemic uncertainty, will have to be politically backstopped. It can also mean naming clear targets for fossil fuels, as for renewables. For example, if we wish to use relatively climate-friendly gas in the electricity and/or transport sectors, for which there are good arguments, then that objective should be more clearly stated and pursued. It would certainly be helpful in the medium term to expand relations with gas producers to include other fields of cooperation and thus offer them a compensation for the devaluation of their traditional sources of income.

It is therefore important to have a discussion about *the actors and the necessary mix of actors and transactions*. Precisely because acquiring large quantities of gas and pursuing investment plans in production and infrastructure is no easy matter, these questions are of great relevance. There are good grounds to strengthen the demand side from importer through to final consumer, and thereby promote backward consolidation of these segments. If consumers and producers can meet as equals this is likely to be helpful for balancing supply and demand and thus stabilising relations.

In transactions a mix of commercial contacts and (long term) contracts appears a judicious way to provide basic quantities for the market at predictable prices and thus contain volatility. That would also

restrict the possibilities for big gas producers to influence prices and quantities. With the international gas market dominated by an oligopoly the possibility of price-fixing cannot be ruled out, especially where producers are beyond the regulatory and judicial reach of the EU.

*Crisis management.* The market alone will not ensure security of supply because gas suppliers have an interest in scarcity. Crises promise fat profits at the cost of the national economy and the consumer. For that reason we need a political discussion about the desired degree of security of supply in the event of crisis that also includes the costs and their distribution between market actors and consumers. This is particularly valid for gas infrastructure. Moreover, strategic gas storage and emergency stocks are imperative at both the German and European levels.

Aggregation of information and transparency within the system must be further improved. The question of who decides to release gas from reserves and who decides to invoke interruptible contracts is highly relevant. The discussion must tie in the question of substitution and the potential for contagion in the electricity sector. Clear crisis responsibilities, information management and liability rules are crucial for risk management in the gas market. Although the companies are the main actors responsible for ensuring supply, security of supply is a public good and the final instance is the state.

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