

Natural Gas in Cold War Europe: The Making of a Critical Transnational Infrastructure

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Introduction

On 1 January 2006, the Russian gas company Gazprom hastily decided to interrupt its delivery of natural gas to neighbouring Ukraine. During a few dramatic days the Russian decision gave rise to worries in large parts of Europe, since the interruption to Ukraine also had a direct influence on gas supply to countries located further downstream the same pipeline. On 2 January, gas companies in Hungary, Slovakia and Austria reported a drastic drop in pressure – at a time of peak winter demand for natural gas. The crisis threatened the steady supply of electricity and heat to a vast number of industrial enterprises, power plants, hospitals, schools, households and other gas users.

The immediate reason for the crisis was the failure to come to agreement about a renewal of the Russian-Ukrainian gas export and transit contract. This problem, however, was in turn related to the strained relations between the two countries in general following the recent “Orange Revolution”, after which Ukraine had embarked on a more Western- and less Russian-oriented political development. The acute problem of delivery was later solved through negotiations and the conclusion of a new Russian-Ukrainian gas contract, but the crisis gave rise to dismay and perplexity in Europe. Within the EU, demands for sanctions against Russia were raised. From a German perspective, the incident seemed to confirm the need for a new direct natural gas connection between Germany and Russia through the Baltic Sea – the Nord Stream pipeline – as an alternative to the apparently risky and unreliable transit infrastructure through Ukraine, Slovakia, the Czech Republic and Poland. However, in Central European media the proposed Nord Stream pipeline was interpreted as a threat. Poland’s foreign minister Radoslaw Sikorski even dubbed the project “the Molotov-Ribbentrop Pipeline”, since it in his – and many others’ – view aroused unpleasant associations to the infamous Soviet-German pact of 1939.¹

Similar “gas crises” became a more or less regular phenomenon in Europe during the following years, culminating in the much-publicized crisis of January 2009, which affected nearly all European countries in one way or the other. From 2010, following the election of a new, more Russian-friendly Ukrainian president, gas relations in Europe seemed to be normalizing again – for the time being.

The gas crises of 2006 and 2009 are indicative of the explosive politics that have come to accompany the supply of natural gas in Europe, and of the deep embeddedness of this infrastructure in European political and economic history. The actual existence of a European natural gas grid – with a complexity that has increased dramatically during only a few volatile decades – is intriguing: it provides a case of a

truly pan-European infrastructure that today includes large-scale transnational flows not only within more narrowly defined European regions (such as the EU or Scandinavia), but also across the former Iron Curtain as well as between Europe and the Arab world. Many European countries have thereby developed strong dependencies upon natural gas deliveries from countries that in other spheres of 20th century politics were typically regarded as untrustworthy or even as enemies. Excluding the major exporting nations, the average gas import dependence in Europe is now more than 90%.² Natural gas has in this sense contributed to a far-reaching “hidden integration” between different European nations and regions as well as between Europe and the world beyond.

This chapter sets out to explain how this remarkable development has been possible and why so many countries have found it acceptable to engage in infrastructural relations that have made them vulnerable. In particular, the chapter aims to explain how system-builders were able to transcend political, ideological and military divides, such as the “Iron Curtain”. Which actors and groups have tried to resist the emergence of the links, and why? How has the rise of new interdependencies and vulnerabilities stemming from the far-reaching transnationalization of natural gas been anticipated, perceived and interpreted? To what extent has vulnerability shifted over time, and what have actors done to shape and respond to the perceived risks? And, last but not least, what Europe can be discerned when we look at it through the lens of natural gas?

Previous research on these issues has been surprisingly rare. Whereas natural gas has been widely studied from economic, political, legal and other social and natural science perspectives,³ it has been much neglected object of historical study, particularly when it comes to international aspects. What is lacking, in particular, are deeper historical studies of the very emergence of transnational gas relations and the associated vulnerabilities that these have given rise to. While a few promising exceptions of such studies exist,⁴ the present text is the first attempt to inquire the history of natural gas at a European level.

To do this, the chapter uses primary research in Dutch, (West and East) German, Austrian, Ukrainian, Russian, Danish and Swedish archives. Our method has been based on the principle of symmetry, taking into account documents from “both sides” in a given transnational gas relation. Our ambition has been to document Europe’s natural gas history from the perspective of those people and organizations who have been – or tried to be – central in envisioning, negotiating, planning, building, operating and regulating this infrastructure.⁵

The chapter is structured into several layers, each of which scrutinizes Europe’s natural gas history from a different perspective. The first layer consists of a “horizontal” analysis of the European gas grid, whereby *gas fields* and the *material pipeline infrastructure* are at the centre. It focuses on the sequence by which different links were envisaged, built and used – as well as on links that were *not* built – and on the opportunities seen by system-builders and other actors regarding the growing intertwinement of regions that were initially isolated from each other. The second layer shifts the emphasis to the *governance* of the European natural gas system. By analyzing transnational gas contracts, we try to discern how perceptions of vulnerability influenced the institutional set-up of the European gas system. The third

layer consists of an analysis of how actors, when engaging in transnational gas relations, have *coped with vulnerability in practice*. We analyze the concrete measures taken to reduce risks and prepare for action in times of crisis. The fourth layer, finally, focuses on the ways in which “Europe” can be understood through the lens of natural gas.

The emergence of a transcontinental network

The late rise of natural gas

Natural gas – or “earth gas”, as it is called in many European languages⁶ – has been known in Europe for centuries, but for a long time this did not lead to any actual use of this fossil resource on a larger scale. Natural gas was usually regarded as an annoying by-product of oil and the challenge was to get rid of it as effectively as possible. Hence most natural gas was flared.

The history of natural gas in Europe started in earnest in the interwar years, when entrepreneurs in a few European regions started to experiment with it for various purposes, mainly as a substitute for *manufactured* gas.⁷ World War II provided a further major impetus to the development, with natural gas being identified, in those countries where gas finds were known, as a safe domestic energy source that could counteract the increasingly problematic reliance on imported coal and oil.

The first major natural gas networks that took form in Europe were built in countries (or regions within countries) where coal was not available regionally, particularly in Romania, Austria, northern Italy, southwestern France and the eastern regions of interwar Poland. In Britain, Germany, Belgium, western Czechoslovakia, southern Poland, northern France, the Soviet Donbass industrial area and other coal-rich regions, the coal-based gas infrastructure continued to dominate over the emerging natural gas networks up to the 1960s.

Up to the mid-1960s, the European gas infrastructure still consisted of a number of isolated national or regional networks that seemed to be a long way from being interlinked with each other. In the years around 1960s, however, new vast natural gas resources were discovered in several regions in Europe and beyond, with the northern Netherlands, the Sahara, eastern Ukraine, Central Asia and northwestern Siberia emerging as particularly promising new gas regions. The estimated reserves of the fields were so large that substantial exports of natural gas seemed to become economically justifiable.

In the absence of opportunities to import natural gas from far away, natural gas would have remained a negligible source of energy in most European countries. As a result of international trade, however, the share of natural gas in the overall primary energy balance of Europe grew from around 3% in 1960 to 25% in 2008 – an increase that was even more dramatic in terms of absolute volumes of gas consumed. The growth in gas use and gas imports radically increased Europe’s vulnerability to supply interruptions, as an increased number of users and activities became dependent on reliable flows of gas. Imported natural gas started to be used as a fuel in a variety of industrial sectors (for the production of metals, cement, glass, etc.) as well as in households (for cooking and heating) and the energy sector itself (heat and power

plants). There were also efforts to introduce natural gas for transportation purposes, though this has only recently seen some success. Apart from its use as a direct energy source, natural gas was used as a crucial feedstock in the chemical industry, particularly for the production of fertilizers (where the energy content of the gas was used indirectly for boosting agricultural production).

The formative phase of transnational links

Europe's first major transnational pipelines were built to bring natural gas from the vast Groningen field in the Netherlands (discovered in 1959) and from a number of smaller gas fields in western Ukraine (which were known since before the war) to major consumption centres in Western and Eastern Europe, respectively. Groningen gas was transported to neighbouring Belgium and Germany from 1966, and to France by way of Belgium from 1967. In the east, Ukrainian gas was brought to Poland from 1944 and to Czechoslovakia from 1967. In the Polish case, the pipeline in question had been built before and during the war as a domestic link, but the border changes after the war transformed it into a transnational link.

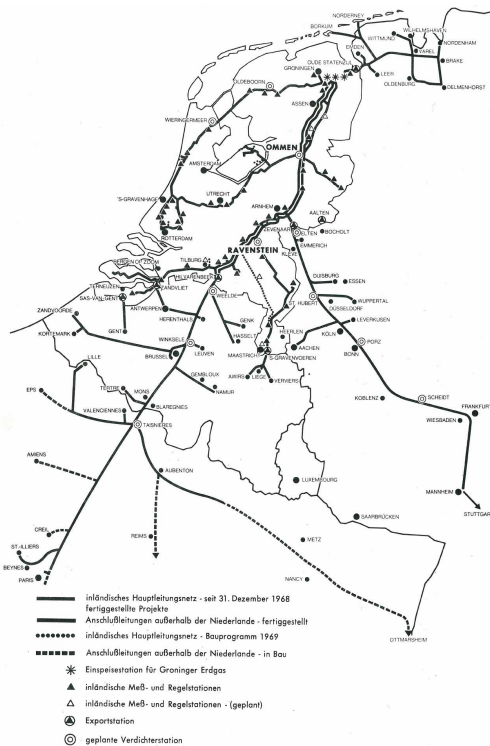


Figure 1. The natural gas export infrastructure with transnational pipelines from the Netherlands to West Germany, Belgium and France, as of 1968, with plans for 1969.

1966-1967 thus marked a breakthrough in transnational system-building within both the capitalist and communist parts of Europe. The pipelines from Groningen went to countries that similarly to the Netherlands were NATO and EEC members, and they seemed to fit neatly into a pattern of earlier transnational energy cooperation, notably in the form of the European Coal and Steel Community, EURATOM and joint facilities for uranium enrichment and plutonium production. Soviet gas exports to

Poland and Bulgaria similarly built on earlier experiences of cooperation within the COMECON, with the much publicized “Druzhba” (Friendship) oil pipeline system playing a special role. The gas link to Czechoslovakia that commenced in 1967 was optimistically referred to as the “Bratstvo” (Brotherhood) pipeline.

In the next phase, however, the development took a different turn. The initial trend towards the formation of two major meso-regional natural gas networks, i.e. a “capitalist” and a “communist” network, separated from each other by an “Iron Curtain”, could not be sustained. The political logic in terms of choice of partners gave way to a dominance of economic and geographical factors in transnational system-building.

A West European interest in Saharan gas had been obvious following the discovery of the large Algerian gas field Hassi R’Mel in the late 1950s, and possible trade regimes, most of which focused on shipments of liquefied natural gas (LNG), were discussed intensively both nationally and within international organizations. The United Nations’ Economic Committee for Europe (ECE) launched a Gas Committee which became an important forum for discussing the prospects for Saharan gas with participants from both Western and Eastern Europe. The Committee discussed legal aspects of transnational pipelines and other fundamental aspects of the possible international gas trade. Two pipelines envisioned from Algeria to Britain, France, Spain and Italy are shown in the map below, whose title – “The European gas network” – indicates that some actors had at this time started to think and talk about natural gas in “European” terms.⁸

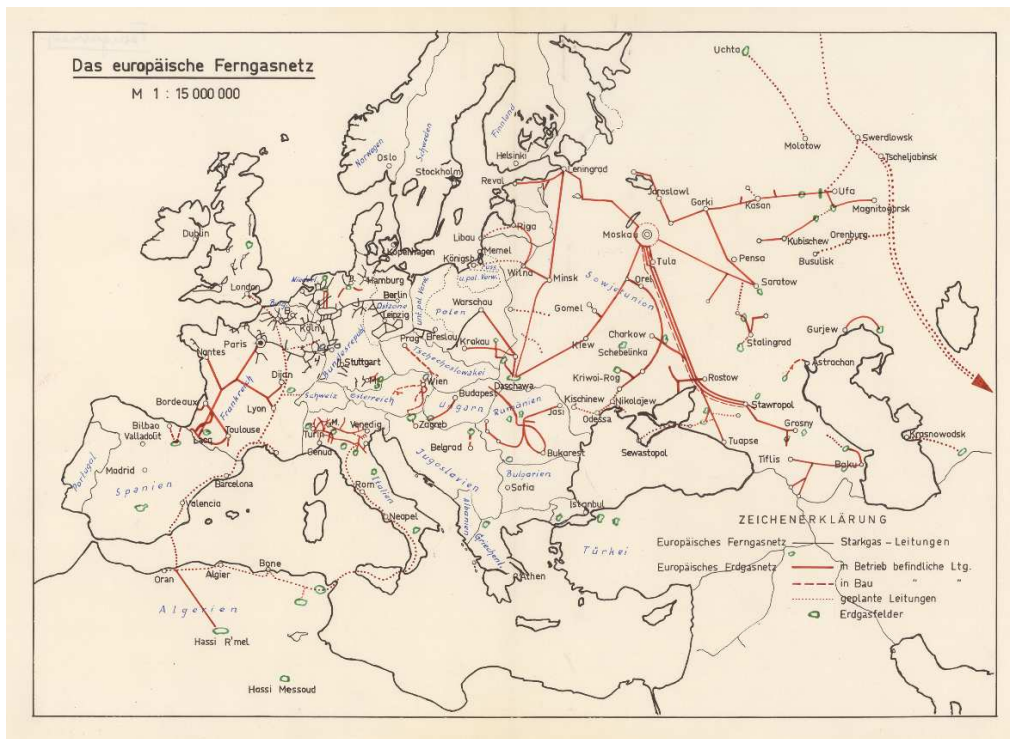


Figure 2. A German map of the European gas grid around 1965. Red lines refer to natural gas pipelines, whereas black lines represent the coal gas network. The map is

not completely accurate, but gives a good overview of the major coal gas and natural gas regions.

In the end, Saharan gas started to be exported not by pipeline, but in liquefied form (LNG). A number of agreements were concluded from the early 1960s with Libya and particularly with newly independent Algeria for LNG imports to England, France, Italy, Yugoslavia and Spain. These contracts were often negotiated in parallel with negotiations for Dutch gas, with the importing countries seeking to play out different exporters against each other and thus establish a competitive market.

However, although the hopes for Algerian gas to play a key role in Europe's gas supply were held high from the beginning, it turned out much more difficult than initially expected to turn the grand visions into reality. The agreements that were concluded in the 1960s and early 1970s were thus fairly small, particularly in comparison to the rapidly growing Dutch gas exports. The development took a more dynamic turn in 1977, when ENI and Sonatrach, together with Tunisia as a transit country, concluded a major contract for Algerian gas exports to Italy and the construction of a sub-sea pipeline to Sicily and further on to the Italian mainland. The pipeline could eventually be inaugurated in 1983, and two decades later the volume of gas flowing through it corresponded to around a third of Italy's total gas demand. A similar pipeline project between Algeria and Spain, by way of transit through Morocco, failed and could only be realized in the late 1990s.⁹

As a third potential supplier, in addition to Dutch and Saharan gas, the Soviet Union emerged. The export of Soviet natural gas across the Iron Curtain to Western Europe is one of the most intriguing aspects of Europe's natural gas history, and the motivations for West European actors to import Soviet gas should therefore be discussed in somewhat further depth here.

The capitalist country with the strongest motivation to import Soviet gas was Austria. The Austrian state-owned oil and gas company ÖMV got highly interested in the Soviet-Czechoslovak "Bratstvo" project and immediately inquired in Moscow whether there was any opportunity for Austria to become part of the Soviet-Czechoslovak gaseous brotherhood.¹⁰ Austria, which lacked coal, was one of the forerunners in the European natural gas industry, but precisely through the successful marketing of natural gas domestically ÖMV soon found itself struggling to meet an ever growing gas demand, which on the long term could not be met through domestic production. From this perspective the Bratstvo project was highly attractive, given a distance between this pipeline system and the Austrian network of only 16 km! Moreover, Austrian and Czechoslovak gas enterprises had already developed a close cooperation in the form of the joint exploitation of a large gas field situated just at the border between the two countries.¹¹ However, the Soviet gas industry faced enormous difficulties at this time meeting even domestic demand, and the Soviets did therefore not give any positive reply to ÖMV's request.

In 1965, however, negotiations started between the Soviet Union and the Italian state-owned oil and gas company ENI, aimed at exploiting the vast discoveries of Siberian natural gas that had recently been made.¹² ENI was clearly the West European oil and gas company with the best relations to the Soviet Union, already being a major oil importer as well as an exporter to the communist bloc of advanced equipment for the

oil and gas industries.¹³ Italy also had a strong communist party which sought ways of strengthening relations with the Soviet Union as the leading communist country. ENI and the Soviets elaborated on a pipeline that in both Western and Eastern media was referred to as the “Trans-European Pipeline”, with origins in the newly discovered Siberian gas regions and stretching towards north-eastern Italy by way of transit through Hungary and Yugoslavia. In June 1966, the Soviet government formally ordered its Gas Ministry to initiate negotiations with ENI.¹⁴

When ÖMV got to hear about this project, it initiated a new campaign for getting access to Soviet gas, seeking to become part of the Soviet-Italian project. ÖMV managed to reach this goal by cooperating with the state-owned Austrian steel company VÖEST, which offered the Soviets large amounts of large-size steel pipe, to be used for the gas pipeline, in return for gas imports. As a matter of fact, VÖEST did not have the competence to produce these pipes, but only the thick steel plates that were used as an intermediary product. However, VÖEST’s director Rudolf Lukesch agreed on a cooperative deal with the pipe producing plants belonging to the large German steel companies Thyssen and Mannesmann; these possessed Europe’s most modern factories for the production of large-diameter steel pipe, which the Soviets were very keen to get access to for the exploitation of its Siberian gas fields.¹⁵ Hence Germany also became indirectly involved in the Trans-European project. For the Germans, this was seen as highly advantageous at a time when a NATO embargo on pipe exports to the communist bloc was in force. The embargo had been decided upon on US initiative following the construction of the Berlin Wall in 1961 and the Cuban missile crisis in 1962.¹⁶

Bavarian Minister of Economy Otto Schedl sought to extend this Soviet-Italian-Austrian-German arrangement by inquiring the possibilities for southern Germany to import Soviet natural gas. Bavaria was an underdeveloped region in post-war Germany, and Schedl thought that the key to a modern, industrial Bavaria was the access to competitively priced energy. Bavaria was traditionally dependent upon north German coal, which had to be transported over a long distance and which therefore gave Bavaria a competitive disadvantage vis-à-vis northern Germany. In the early 1960s Schedl managed to arrange for the import of cheap oil from the Middle East by way of pipelines from Mediterranean harbours, and he identified the access to Soviet gas as a further way of strengthening Bavaria’s energy independence and industrial competitiveness. Schedl was a Christian Democrat but believed in the benefits of cooperation with Soviet communists; to him, Russia and Germany belonged to the same cultural sphere and should therefore cooperate, whereas the real danger to European civilization was the threat from China, where Mao Zedong at this time had just proclaimed “Cultural Revolution”.¹⁷

The German government, however, which at this time was a grand right-left coalition headed by Chancellor Kurt Georg Kiesinger of the Christian Democrats, found it much too risky and uncertain to link the pipe exports to a gas import from the East. The government’s energy experts at the Federal Ministry of Economy thought that the Soviet Union might on the one hand use the threat of interrupted gas supplies for political blackmail, while on the other hand they thought that the Soviets might – quite on the contrary – seek to flood the German market with cheap natural gas, deliberately aiming to disturb the politically sensitive coal industry in the Ruhr, which was already facing severe difficulties due to inefficiencies and competition from

however, the Soviet-Italian talks were reinitiated. At the same time new trends in West Germany's eastern policies allowed for a re-evaluation of the opportunity to import gas from beyond the Iron Curtain. The key persons behind this new policy were Minister of Foreign Affairs Will Brandt, his close advisor Egon Bahr at the Foreign Office and State Secretary Klaus von Dohnanyi at the Ministry of Economy – all of whom were social democrats who had earlier been working together in the Senate of West Berlin. Brandt, who advanced to become Chancellor in 1969, integrated the East-West gas pipeline scheme into his new “Ostpolitik”. Bavarian Minister of Economy Otto Schedl, the Christian Democrat who had initiated the West German interest in Soviet gas back in 1966, was largely bypassed in the process, and this concerned also the regional Bavarian gas industry.²⁰

Agreements were reached with both Italy and West Germany around new year 1970. It is interesting to note that the United States did not object to the German deal. Esso, which regarded the Soviet gas as a competitor to its own German activities, lobbied Washington seeking to prevent the deal, though in vain. The German government inquired with the US embassy whether it would object, but was given green light from the Nixon administration.²¹

Finland also negotiated a gas deal with the Soviet Union. Although relations between Finland and the Soviet Union were peaceful, guided as they were by the agreement of Friendship, Cooperation and Mutual Assistance from 1948, the discussions surrounding the natural gas pipeline were lively.²² The official discussion concerned mainly operational reliability, but there was an underlying fear regarding the consequences of being totally dependent on the Soviet Union, who might be able to use the pipeline for political pressure.²³

Despite these discussions, a deal with the Soviet Union could be signed in 1971, and in terms of price the Soviets were “surprisingly accommodating”.²⁴ At this time the project was more than a way of importing energy for Finland. As in the Austrian case, it was an important mean to balance the bilateral trade with the Soviet Union, as well as a demonstration of friendly relations between the two countries.²⁵

The first cubic metres of Soviet gas flowed into West Germany in late 1973 and into Italy in spring 1974. Finland also started importing Soviet gas in 1974 and France followed in 1976, by way of transit through Germany. Negotiations with Sweden were held but ultimately failed. Except for Finland, all importing countries received their gas through the same pipeline, which went through Czechoslovakia. Within the Eastern bloc, the GDR was linked in 1973 to this system, using a different pipeline but the same geographical route through Czechoslovakia. Bulgaria also started importing Soviet gas by way of Romania, through a more southern pipeline.

North Sea gas and the Nordic failure to create an integrated gas infrastructure

The oil crisis in 1973/74 further boosted the popularity of natural gas in many European countries. Natural gas was seen as a suitable way of diversifying away from oil and in particular from a reliance on the OPEC. An advantage was seen in the fact that the oil exporters coincided only to a limited extent with the major gas exporters. The only notable gas exporter that was also a major OPEC oil exporter was Algeria, but OPEC coordinated only oil and not gas exports. Vulnerability considerations

regarding oil hence contributed strongly to an expanded European natural gas trade. In addition, the high hopes for cheap nuclear power met disappointment in the form of technical problems and environmental criticism. Coal was also subject to strong environmental concerns. This further served to boost the popularity of natural gas as an alternative fuel.²⁶ The resulting increase in natural gas demand, however, also meant that the level of import dependence increased further and that increasingly remote gas fields had to be linked to the major consumption centres.

In the Netherlands the oil crisis in combination with growing concern about the (un)safety of nuclear power triggered an intense debate on energy policy in the mid-1970s, which resulted in a major policy change concerning gas exports. Since cheap nuclear power was no longer seen as a probable future option and OPEC had demonstrated the vulnerability of oil imports, the Netherlands decided to save as much as possible of its gas resources for the future rather than export it. The Dutch gas company Gasunie was obligated to fulfil the gas contracts it had already signed, but was instructed not to sign any additional export contracts.

From this perspective, the discovery of vast oil and gas fields in the North Sea starting in the late 1960s was highly welcome for those regions that had become heavily dependent on imports from the Netherlands. Gas was discovered in the British, Danish, Dutch and Norwegian sectors of the North Sea (the economic partition of which was being negotiated at the time). On this basis, the creation of a new, submarine pipeline network was initiated.

For Northern Europe, the new sources in the North Sea made it possible to become part of the European natural gas market. In the end of the 1970s, exports of Danish natural gas to southern Sweden as well as to Germany started. There were also attempts to bring about an integration of North Sea and Soviet gas, by way of pipelines through Sweden and across the Baltic Sea. Finland was interesting in this possibility, since it seemed to offer a way of decreasing this country's total dependence on Soviet gas. Sweden was also interested and the idea was taken up for discussion during the Finnish negotiations with the Soviet Union in 1970-71 (see above).²⁷ However, the vision did in the end not materialize, mainly as a consequence of the small amounts of gas that the Soviet Union offered.²⁸

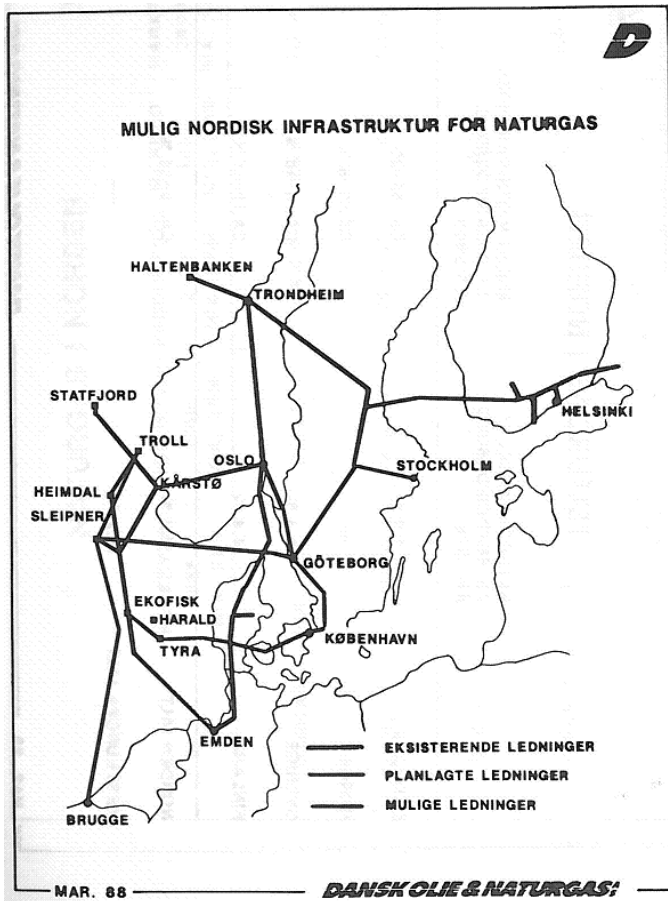


Figure 4. One possible view of a future Nordic natural gas grid, as envisaged by the Danish oil and gas company DONG at a Nordic Council seminar in March 1988.

The pipeline through which Danish gas was exported to Sweden, the Sydgas (South Gas) pipeline, was constructed between 1980 and 1985, and it still remains the only transnational pipeline between two Nordic countries. Despite numerous grandiose plans and visions aimed at the creation of a Nordic gas system, no further pipelines have been built.²⁹ In light of the pipelines being constructed across the Iron Curtain and the Mediterranean it is remarkable that neighbours such as Denmark, Finland, Norway and Sweden – with friendly relations and a similar culture – have not been able to connect to each other in natural gas.

The gas industry facing political turbulence

With large reserves of Dutch and North Sea gas available, it appeared acceptable, from a security of supply perspective, to further extend the import arrangements from non-European sources. Contracts with Soviet and Algerian suppliers were extended. West European gas companies also became increasingly interested in importing gas from the Middle East. Iran and Qatar were of particular interest here, from where the gas could be supplied either by pipeline or in the form of LNG. An emerging international competition for the Middle Eastern gas fields was evident, with resource-poor Japan also seeking access to gas from Iran and Qatar. Natural gas seemed to become an increasingly globalized fuel.

Two competing pipeline projects were being negotiated for the import of Iranian gas to Europe after the first oil crisis. The Soviet Union, which since 1970 imported natural gas from Iran for the supply of its trans-Caucasian republics (Georgia, Armenia and Azerbaijan), sought to use this experience and offered itself as a transit country for Iranian gas to the West. The other alternative was a transit through Turkey and south-eastern Europe. The large German gas company Ruhrgas was the main proponent for the first alternative, whereas Italy's ENI supported the other project. In the end the Soviet alternative seemed to win the struggle, and a contract could be signed in 1975 in which Germany, Austria and France were to import Iranian gas. The pipeline that was necessary in Iran started to be built and the plans for natural gas system-building in the importing countries were adapted accordingly. In early 1979, however, Iran was shaken by revolution. The Shah was forced to abdicate and the political power was seized by Ayatollah Khomeini. The gas pipeline, almost finished, was attacked and partly destroyed in the chaos that followed, and the project had to be given up.

At about the same time, the East-West political climate started to worsen, particularly after the Soviet invasion of Afghanistan in December 1979 and the election of Ronald Reagan as US President a year later. The United States, which had so far taken a more or less passive, though far from supportive, stance to Western Europe's imports of "communist" gas, from now on repeatedly tried to prevent the flourishing East-West gas trade, which at this time was embodied by the planned completion of a new large Soviet export pipeline. The CIA reported to the Reagan administration that an

"increased dependence on Soviet gas will almost certainly influence European decision-making, despite likely efforts to provide a cushion against supply cutoffs. The Soviets conceivably could exacerbate European differences with the US over future economic sanctions against the USSR or even over more sensitive issues such as NATO force modernization."³⁰

The US feared an increasing political dependence of Western Europe on the communist world and a divergence in terms of loyalties. However, the Americans failed to persuade their European NATO partners, who perceived the project as a logical extension of the already established cooperation and which did not perceived the vulnerabilities as that alarming. The much publicized export pipeline was taken into operation in 1983, and between 1985 and 1990, Soviet gas exports nearly doubled.



Figure 5. A Soviet stamp from 1983, issued as part of celebrating the completion of the major export pipeline – the “Transcontinental Export Pipeline”, as it is called here – from Siberia to Western Europe.

A dramatic turning point in Europe’s natural gas history came with the fall of communism. Eastern Europe’s liberation attempts in late 1980s were reflected in intense attempts to reorient its natural gas supplies, away from a reliance on the Soviet Union, hence forming a starting point for post-communist system-building with a variety of new East-West linkages.

All in all, the emergence of the European natural gas grid presents a stark contrast to the electricity case (see next chapter). The natural gas system became a truly pan-European system, stretching from Siberia to Ireland, with large-scale transnational flows of fuel. Tables 1 and 2 illustrate the general trends in the changing gas import and export structure in Europe. Europe as a whole has become much more dependent on imported natural gas than before. Moreover, whereas Western European intra-trade still accounted for 67% of all imports in 1982, this figure had fallen to 45% in 2005 – despite the surge in North Sea gas production and Norwegian gas exports. Of the non-Western exporters, Russia was the most important one, with a share of 29%.

Table 1. West European gas imports in 1982, by exporting country (million cubic metres).

	Western Europe	Soviet Union	Algeria	Libya
Austria	40	2,961		
Belgium	9,153		376	
Finland		694		
France	9,990	3,650	6680	
West Germany	32,579	10,889		
Italy	4,851	8,611		26
Netherlands	3,578			
Spain			1290	954
Switzerland	1,192			
United Kingdom	10,682		16	
TOTAL	72,065	26,805	8,362	980

Source: IEA Annual Oil and Gas Statistics 1981/82 (Paris: OECD, 1984).

Table 2. West European gas imports by exporting country, 2005 (bcm).

	Russia	Algeria	Western Europe	Qatar	Nigeria
Austria	4.9		1.8		
Belgium	0.9	3.4	10.9		
Finland	4.4				
France	10.2	8.3	20.4		3.9
Germany	38.3		49.2		
Italy	23.9	28.1	14.1		
Netherlands	3.5		17.2		
Portugal		3.0			1.9
Spain		16.4	2.4	5.3	5.9
Sweden			1.0		
Switzerland	0.3		2.8		
United Kingdom		0.4	12.4		
TOTAL	86.4	59.6	132.2	5.3	11.7

Source: 2005 Energy Statistics Yearbook United Nations (New York: United Nations, 2006).

Enabling transnational governance

Given the uncertainty in trying out something completely new with a variety of different partners, both importers and exporters of natural gas perceived a high degree of “system vulnerability” when embarking on the first transnational pipeline projects. As in other radical technological projects, no one could be certain that the new system would work as envisioned. An advantage, however, was that “user vulnerabilities” were still low. This was a consequence of the fact that natural gas was still of negligible importance to Europe’s overall energy supply. In other words, even in case of major gas disruption, the actual effects on economy and society were limited. The low level of user vulnerabilities made it easier for system-builders to experiment with transnational arrangements, particularly in cases where the cooperative projects did not demand any large investments. With growing volumes of gas consumed and traded, however, vulnerabilities grew and the need to respond to them increased.

In the following two sections we investigate the mechanisms that actors have developed to reduce and counteract the perceived vulnerabilities stemming from their import dependence, to such an extent that it has been considered safe enough to engage in large-scale transnational system-building. First, we discuss “soft” solutions in the form of institutional mechanisms for governing the transnational gas infrastructure. In the following section we then turn to the “hard” solutions in the form of technical arrangements for coping with vulnerability and uncertainty.

Finding reliable partners

The enormous investments necessary for the construction of transmission pipelines, compressor stations and other components in the gas infrastructure demanded a trustful cooperation between the involved partners. The pipelines would have no

alternative use if gas exports, for some reason, would cease, and this would have a severe economic impact on both exporters and importers. Reducing vulnerability was therefore first of all a matter of *finding reliable partners*. Exporters had to persuade importers of their intentions to actually deliver the gas, and of their technical and organizational capacity to do so. Conversely, importers had to persuade exporters that they actually intended to receive and pay for the gas and that they were technically able to do that.

Trustful relations could be established more easily if the partners had experience of earlier cooperation, i.e. in areas other than gas trade. Much of Western Europe's imports of Soviet natural gas, for example, emerged as an extension of an already well-established oil trade. ENI in Italy and ÖMV in Austria were examples of West European importers of Soviet gas which had long experience of dealing with the Soviets for the purpose of oil imports.

Conversely, it was more difficult to build trust when such earlier experience was missing. In some cases, vulnerability considerations of a political nature thereby prevented transnational pipeline projects from being realized. For example, the German Ministry of Economy was initially suspicious about Bavaria's desire to import Soviet natural gas:

“It may be expected that the Soviet price bid, for political reasons, will be manipulated to be sufficiently low, if there is a serious intention to deliver natural gas to the FRG. In the case of a far-reaching dependence in the gas supply of the Federal Republic or in parts of it upon Soviet deliveries, it must be feared that different political considerations from the Soviet side could lead to an increase in price or to a curbing or suspension of deliveries.”³¹

This was the main reason for Bonn's disapproval of Bavaria's efforts to conclude a contract with the Soviet Union in 1966-67.

In the case of West European imports from Algeria, it was more difficult to establish trustful relations than in the case of imports from the Soviet Union. Algeria had been a French colony until 1962, and the country's independence was followed by political turmoil and economic chaos. The new political leaders often changed their mind regarding what was to be regarded as a “fair” gas price. As a result, several “agreements in principle” and even a few final contracts with the Algerian state oil and gas company SONATRACH did, in the end, not materialize. In Germany, an LNG terminal that had started to be built at Wilhelmshaven for receiving Algerian gas was never completed. Several West European gas companies with an interest in Algerian gas eventually judged that cooperation with Algeria was too risky.³² Although far-reaching visions for a key Algerian role in Europe's gas supply were promoted already in the 1950s, it took until the 1980s before exports from Algeria actually experienced a breakthrough.

On the longer term, hesitant to-be-importers were often convinced of the trustworthiness of a certain exporter by its convincing performance in terms of exports to other countries. Pilot projects, where the economic stakes were not that high, were thus of a certain significance. Transnational gas relations often started through agreements between countries (or regions within countries) whose existing gas infrastructures offered convenient interconnection possibilities. The necessary

investments in cross-border pipelines were in such cases not very large and the perceived economic risks low. For example, when Austria started to import natural gas from the Soviet Union by way of Czechoslovakia, only 16 km of new pipelines had to be built to interconnect the already existing national infrastructures of Austria and Czechoslovakia. The trade, which started in 1968, was reported to function satisfactorily, and this became an argument for the German Ministry of Economy to change its mind regarding the Soviet Union as a gas exporter. The perceived trustworthiness of this country then increased gradually. By 1969, an import from the East corresponding to up to 10% of total German demand was considered acceptable from a security perspective.³³ Three years later, the perceived vulnerability had decreased so that a level of 14% was not regarded as problematic.³⁴ In the early 21st century, Russian gas covered around 35% of total German gas demand.³⁵

The foreign partners also included actors in third countries that were needed for transiting the gas. Some transit routes were seen as too risky. West Germany, for example, did not wish to import Soviet gas by way of the GDR at a time when West Germany had not even recognized the existence of the GDR as a sovereign state. Importing gas by way of Czechoslovakia, in contrast, was politically acceptable. Similarly, the GDR and the Soviet Union favoured Czechoslovakia as a transit country over the politically more unpredictable Poland. The plan for the GDR's gas supply was originally to transit the gas through Poland, but after the violent strikes in northern Poland in 1969, the Soviets changed the plan and the GDR was instead supplied through the much longer Czechoslovak route.³⁶ Relations with transit countries thus strongly influenced the European network geography in natural gas.

Contractual arrangements

Carefully designed long-term bilateral gas contracts became the core feature in governing the emerging transnational infrastructure. The first of these contracts, which were typically signed for a period of 15-25 years, were negotiated between the Dutch gas company NAM and importing companies in Germany, Belgium and France. Esso and Shell were dominant shareholders in both NAM and several of the importing companies and they could therefore strongly influence the style of the contracts. The Dutch export contracts became a model for governing transnational gas relations in Europe. Soviet exports, in particular, were largely modelled after the Dutch experience. When the Soviet Union started to consider gas exports to Western Europe, the first thing Moscow did was to arrange a meeting with representatives from NAM and Thyssengas (the first large German importer of Dutch gas), seeking to understand how Dutch exports had come about and how they were organized.³⁷ When Ruhrgas in West Germany negotiated the gas price with the Soviet foreign trade organizations, the Dutch export price was also a central point of reference to which all other issues had to refer.³⁸ The Dutch contractual model also spread to countries that were not directly involved in the original deal with NAM, such as Sweden and Denmark.

The contracts contained extensive paragraphs defining technical aspects such as gas quality and how it was to be measured, but the key features of the contracts concerned the gas price. The governments in importing countries took an active role in assuring a "harmonic" entry of Dutch gas onto their fuel markets. Hence the gas price would have to be competitive, but not too low. To reduce the risk that the gas would

outcompete or be outcompeted by other energy sources, it became important to adapt the gas price to the price of competing fuels, of which the most important was fuel oil. This was fairly unproblematic as long as oil prices remained stable. The first contracts for exports of Dutch and Soviet gas that were signed in the mid-1960s did therefore not explicitly link the gas price to the price of fuel oil, although they allowed for a revision of the gas prices “in the event that economic circumstances beyond the control of the parties” occurred.³⁹ However, with growing price volatility on world fuel markets from around 1970, almost all transnational gas contracts that were signed included a paragraph that linked the gas price to the price of fuel oil, and gave the parties the right to renegotiate the gas price if the oil price changed substantially – upwards or downwards. European gas markets thereby became linked to world market prices for oil.⁴⁰

The gas contracts also regulated potential critical events that might take place in the transnational gas trade. Detailed paragraphs identified formulas for penalties to be paid by the exporter in case of non-delivery or failure to deliver the right gas quality, while listing events in which penalties would not have to be paid. Other ways of dealing with interruptions in the gas supply was through clauses regarding mutual assistance in cases of emergency. This could include mutual use of gas supply, but also the will to start negotiations in case of severe economic “hardship”.⁴¹

As a rule, the gas contracts were placed under the jurisdiction of the exporting country. Thus, in the case of the Sydgas deal, all juridical actions would take place in a Danish court, according to Danish law.⁴² However, in the contracts signed between Western European countries and the Soviet Union, this was never the case. Instead, the contracts would be answering to the laws of a third country.⁴³ Thus the Soviet-Austrian contract of 1968, as well as the Soviet-Finnish contract of 1971, stipulated that in case of a conflict that could not be resolved in a friendly way, an independent court in Sweden would resolve the matter.⁴⁴

The role of the state

The role of the state in negotiating the contracts and governing the transnational gas trade varied from country to country. The Dutch state played a diffuse role behind the scenes when the first exports of Groningen gas were negotiated. It was not formally part of the contractual arrangements.⁴⁵ In West Germany, the state similarly sought to play a “facilitating” role. The German Ministry of Economy sent its gas expert Nobert Plesser as an “observer” to the German-Soviet negotiations and the government made clear to all involved parties what it would accept or not accept.⁴⁶ Formally, however, all import contracts had the status of private business deals. The government’s most immediate role was to act as a guarantor for export credits that were agreed upon in connection with the counter-trade arrangements with the Soviet Union. In Italy, relations between ENI and the government was problematic and conflict-ridden – despite the fact that ENI was state-owned – with ENI acting much more independently than the government thought reasonable.⁴⁷

In the Austrian case, the government was not formally involved, although it was very active in shaping the counter-trade arrangements with the Soviet Union.⁴⁸ However, since the Austrian gas company ÖMV was a fully state-owned company and its relations with the government were less strained than in the Italian case, the

government had a certain indirect control over the negotiations and the contracts. This was also the case when the Sydgas pipeline between Denmark and Sweden was negotiated, as both the exporting and importing companies were state-owned. In this case, however, the respective governments were more prominent in the negotiations, with the initial talks leading to the contract being organized by state officials from the Swedish Ministry of Industry.⁴⁹ The final negotiation about the gas price was even held in private between the Swedish and Danish ministers of energy, Carl-Axel Petri and Poul Nielsen, respectively.⁵⁰

Bilateral vs. multilateral governance

The natural gas story provides an example of transnational governance in which *international organizations* have had very limited influence. Instead, a patchwork of bilateral relations between major gas companies came to form the backbone of European natural gas regime. The EU and other international organizations have formed arenas for discussions, but have not reached much beyond that and appear not to have decisively influenced any major natural gas deals. This concerns also branch-specific organizations such as the gas committee of the ECE, mentioned above, or the International Gas Union (IGU) – both of which had both West and East European members.⁵¹ Gaz de France in the late 1950s and early 1960s actively sought to use the ECE for promoting its vision of Algeria, at that time still a French colony, as the key to the future regarding Europe's oil and gas supply. With the extent of Dutch and North Sea gas reserves still unknown, it sought an alliance with the Soviet Union, seeing the future of Europe in “gas from the sands and gas from the steppes”. The French did not receive any support for the idea, not even from the Soviet Union.⁵²

Natural gas links were nearly always built to enable large-scale physical flows of fuel rather than – as in the case of electricity – exchange on the marginal. Relations were thus asymmetrical and to the extent that larger meso-regional groups of countries found a common interest it was in their role as importers or exporters. Among West European importers, who shared a common interest in enabling secure inflows of gas, there were attempts to develop a closer cooperation at a meso-regional level. The cooperation initially took the form of customer consortia who sought to increase their bargaining power vis-à-vis exporters by acting collectively. These attempts started through the joint West European negotiations for Algerian gas in the early 1970s and later also for Norwegian, Soviet and Iranian gas.⁵³ In some cases, however, it was not only a shared feeling of resource scarcity that allowed such consortia to emerge, but also a feeling of cultural community. Hence the Netherlands participated in some of the importing consortia despite having immense natural gas reserves at its own disposal. But the Dutch were also very active in raising the gas issue at the level of the EEC when its own exports seemed to be facing competition from Algeria and the Soviet Union, arguing that natural gas from outside the EEC should not be given the same rights as Dutch gas on the internal market.⁵⁴

It is an interesting question as to whether it would have been possible to establish a multilaterally rather than bilaterally focused form of governance in the European natural gas industry. In particular, the 1960s was a period where the need for a “common energy policy” was hotly debated within the EEC. However, natural gas was at that time still a negligible energy source in the EEC area and no serious interest could be mobilized in the creation of a common natural gas market. In addition, the

widely diverging interests of the individual EEC member countries made it difficult to agree on a common energy policy. Moreover, it appears that once the first major bilateral contracts had been signed, foreseeing a very long-term cooperation, the fundamentals of the European supply structure had already been defined for the foreseeable future, thus reducing the prospects for establishing an alternative, multilateral regime. A considerable momentum in terms of styles of governance was thus quickly established. It is only from the late 1980s, when a “deregulation” of electricity and gas started to be discussed within the EEC, and the TEN-E programme for support to transnational system-building was launched, that the EEC managed to take a more active part in shaping the European natural gas system.

Coping with vulnerability in practice

From the perspective of gas importers, the worst-case scenario was a long-term, total interruption of gas imports from a major foreign supplier. A first way to reduce this risk was, as we have seen in the previous section, to choose foreign partners that were deemed both trustworthy and competent, and to formulate detailed contractual obligations for the exporter and, in some cases, transmitters. As a complement to these arrangements importers developed methods for preventing a gas disruption, should it actually occur, from (seriously) affecting users.

The quest for diversification

A first strategy pursued in this context was through diversification of the supply sources, so that it was seen as safer to have natural gas supplied from several countries at the same time, than from one country only. Diversification of supply became particularly important as the role of natural gas and the absolute volumes consumed increased. It was regarded as risky to be dependent on a single supplier. Therefore, as soon as agreement had been reached for imports from one country, importers had strong incentives to negotiate additional gas from other exporters, so as to reduce the dependency on the first supplier. As long as different suppliers balanced each other, it was considered acceptable to increase the overall level of import dependence, both in relative and absolute terms. This logic became an important driving force in the further transnationalization of natural gas in Europe. In other words, the quest for diversification tended to accelerate the pace of transnational integration. The diversification logic became particularly evident in large countries such as Germany, France and Italy, which were situated in reasonable proximity of different potential suppliers and which, as a result, came to build the most transnationalized gas systems in Europe. Germany saw it as advantageous to complement imports from the Netherlands with imports from the Soviet Union and later from Norway, whereas Italy’s initial imports of LNG from Libya was quickly complemented by imports of Soviet, Algerian and eventually also Dutch and Norwegian gas.

An interesting issue in the context of diversification was the fact that gas from different sources was not necessarily interchangeable. In particular, Dutch gas from Groningen and north German gas had a lower heating value (lower Wobbe index) than Soviet and Norwegian gas. Groningen gas was referred to as L-gas, as opposed to the H-gas delivered from the Soviet Union, North Africa and the North Sea. In the 1960s, when Dutch gas started to be exported, it seemed that L-gas would become the

standard gas in those countries that imported Dutch gas, largely coinciding with the EEC area. Similarly, H-gas appeared the natural standard gas in Eastern and Southern Europe.

However, when Soviet gas started to be imported to Germany, where Dutch gas was already used to a great extent, a major question was how to deal with the two gas qualities. One possible strategy was to build separate pipeline networks for Dutch and Soviet gas. Another strategy was to transform H-gas into L-gas by adding nitrogen to it. Ruhrgas concluded that separate gas networks might increase vulnerability, since gas of one type would then not be able to come to rescue in case of interrupted gas supply from another source. For this reason, Ruhrgas initially aimed to invest in expensive facilities for harmonizing the Wobbe index of Soviet gas with that of Dutch and north German gas, so that gas from different sources could replace each other. The need for such investments was used as an argument for negotiating a lower gas price with the Soviet Union in 1969.⁵⁵ Shortly after the German-Soviet contract had been signed, however, Ruhrgas changed its strategy so as to enable the use of Soviet gas in Germany without transforming it. Separate H-gas and L-gas networks were thus built, and the arrival of Soviet gas in Germany did therefore not mark a physical integration between the Dutch- and Soviet-based gas infrastructures in Europe. This increased the vulnerability of German gas users, since Dutch gas were of no help in case of a delivery interruption of gas from the Soviet Union. But it also eliminated transformation costs and thus increased the competitiveness of Soviet gas and the profits of Ruhrgas.

Ruhrgas' changed strategy reflected its negotiation skills, but it was also linked to the conclusion of the first contracts for importing Norwegian gas signed in the early 1970s, which had an even higher calorific value than Soviet gas. The difference in quality was much smaller than in the case of H-gas and L-gas, but a gateway was nevertheless considered necessary for converting all Norwegian gas to Soviet gas quality. This was done by adding minor volumes of coal gas to it.⁵⁶ With this arrangement, Norwegian gas came to play a crucial role as emergency fuel in the case of interrupted supplies from the Soviet Union – and vice versa. The arrangement was codified through contractual agreements between Ruhrgas and smaller regional companies for the case of shortages.⁵⁷

Soviet H-gas quality thus became the de facto standard in most parts of Germany, although a separate L-gas network continued to exist in the regions close to the Dutch border. With the decrease in Dutch gas exports to Germany, this area gradually shrank, thus changing the vulnerability geography. This process had consequences for users. In northern Bavaria, complaints were loud among the population when users in 1971-72 first had to switch from coal gas to Dutch natural gas and then in 1974-75 once more from Dutch natural gas to Soviet natural gas – with each transition requiring the purchase of new equipment.⁵⁸

It was thus not an easy issue to use diversification of supply as a method for countering vulnerability. Moreover, not all countries succeeded in diversifying their supplies. As we have seen, both Finland and Sweden, which were totally dependent on the Soviet Union and Denmark, respectively, failed to access additional supplies.

The need for diversification was felt not only in Western Europe, but also in the communist countries of Central and Eastern Europe. The desire to diversify inspired a number of attempts to link up with non-Soviet gas sources, though without much success. East Germany tried in vain to get access to Dutch natural gas as a complement to Soviet imports, and Czechoslovakia similarly failed to link up with LNG supplies from Algeria by way of Adriatic harbours. In the 1980s, Poland discussed a possible pipeline with Norway from the North Sea, but also failed. The reason was presumably opposition from Moscow, but it may also be that the communist-to-be-importers did not manage to persuade Algeria and the Western exporters of their ability and willingness to actually receive and pay for the gas.

The lack of freedom in taking an influence on the emerging natural gas infrastructure was particularly obvious for those countries and regions that had ceased to exist after the war, being incorporated into the Soviet Union – i.e. the Baltics and the eastern regions of what had been interwar Poland. The Baltic republican governments, particularly the Latvian one, were suspicious about the single pipeline through which the Baltic region was connected to the gas fields in Ukraine. The republican governments tried, through numerous petitions to the Gas Ministry and Gosplan in Moscow, to gain support for a more diversified supply structure.⁵⁹ It would take until 1972, however, before this wish was fulfilled through the construction of a new pipeline from central Russia to Riga. By that time, the Baltic republics and Belarus had already come to experience the hardships that followed from numerous gas outages, particularly during winter.

Countering vulnerability through domestic reserves and underground storages

As an alternative to diversification, importing countries and regions could use their local gas fields as a back-up gas source. This strategy became particularly important in countries that were only able to import gas from one country. The existence of domestic gas reserves was an important condition for Austria's conclusion of a first contract with the Soviet Union in 1968. The contract was of enormous importance for the Austrian gas company ÖMV, which foresaw a rapid increase in Soviet deliveries; within only a few years, Soviet gas were to contribute more than a third national consumption. Such a development would have been unthinkable, had the country not had access to substantial domestic gas reserves as a back-up source. The gas geography was particularly convenient in this context: the main Austrian gas fields were located near the Slovak border, where the Soviet gas was to arrive, and ÖMV could therefore treat the imports logistically as just another large gas field. This state of affairs made it possible for the Austrians to be patient regarding the enormous problems that the Soviets faced in seeking to live up to its export obligations during the first few years. It proved extremely difficult for the Soviet gas ministry to live up to its contractual obligations vis-à-vis Austria. During ÖMV's first years of gas imports, partial or total interruptions in supply was the rule rather than exception.⁶⁰ The reasons were linked to the general weakness of the Soviet economy and the central planning system. Soviet gas minister Alexei Kortunov argued that the problems in supplying Austria stemmed not from within the gas ministry itself, but from the failure of other ministries to deliver steel pipes, compressor stations and other equipment necessary to guarantee the new export regime. Sometimes the equipment had been produced, but logistical problems hindered delivery, so that pipeline construction was delayed. In autumn 1968, for example, the Western steel

pipes that the Soviets had bought in return for gas, and which were to be used for constructing the export infrastructure, were lying idle in Leningrad's harbour due to non-availability of railway cars.⁶¹

The Austrians, unaware of the disastrous logistics of the centrally planned Soviet economy, saw the problems as a "childhood disease" in the new arrangement. They could afford to take such a perspective precisely because it was easy for ÖMV to quickly balance any shortages in Soviet gas by way of accelerated domestic production.⁶² Hence Austrian gas users did never notice these early problems and they were not publicly known. Moreover, ÖMV's optimistic interpretation became an argument for Italy, France and Germany to go ahead with their plans to negotiate very large imports of communist gas.

Apart from domestic gas reserves, importing countries also constructed artificial reserves in the form of underground gas storage facilities. These came to play a key role in combating supply interruptions from abroad – although their main purpose was to enable "peak shaving" and, more generally, load factor management, thereby seeking optimal utilization of the national infrastructure. The dual purpose of gas storages – for load factor management and for security of supply – was seen as an advantage since importing countries did not want to openly let their foreign partners know that they felt sceptical about their intentions and abilities regarding the fulfilling of their export obligations.

The most radical European case of a gas storage facility built for security reasons was the controversial West Berlin storage. It involved the creation of a huge underground storage, with the help of which the isolated city would be able to retain its gas supply for nearly a year even in the case of a total interruption of supplies, without users noticing it. The gas was to come from Soviet sources, and a further political uncertainty involved a transit through the GDR. The storage was completed in 1985 and started to be filled gradually during the following years. But when it was eventually full and the city's gas supply thus secured, its main rationale suddenly disappeared, as a consequence of the fall of the Berlin wall.⁶³

The quest for a gas storage facility in Sweden provides a further interesting case. Sweden was particularly vulnerable to potential import disruptions, since it received all its gas by way of a single pipeline (from Denmark) while not possessing any domestic gas fields that could be used as a back-up. Construction of a storage was therefore considered an important investment, despite its being considered both costly and technologically demanding. There was a big interest from different actors to invest in the project, and it was a recurring theme throughout the 1980s and part of the 1990s – despite the relatively small amounts of natural gas that was being imported. However, geological factors prevented the facility from being built, and in the end Sweden handled its security of supply in other ways, for example through negotiating with Denmark on the use of Danish storage facilities.⁶⁴

The strategies of diversification, the use of domestic gas reserves and the construction of gas storages for countering vulnerability were all dependent on the existence of an efficient domestic pipeline infrastructure. Without a good infrastructure, it was impossible to quickly redirect the gas flows in case of an unexpected interruption in supply from abroad. Security considerations in this sense stimulated the construction,

further development and effective maintenance of national gas grids. They also stimulated the development of efficient organizational arrangements and of advanced information and control systems for keeping track of the gas and for the rapid calculation of the most efficient emergence gas flows in the case of an interruption from abroad. Of course, these arrangements could also be used in the case of unexpected interruptions within national systems.

Interruptible customers

An additional fundamental strategy for countering vulnerability was to supply natural gas only to such customers that had access to alternative fuels and which could quickly and easily switch to these. Such arrangements were common particularly in the early phase of development in the European natural gas industry, in both Eastern and Western Europe. The strategy, which could be used both for load factor management and for crisis management, was particularly important in countries and regions that were located at the remote end of a single pipeline and which lacked domestic gas resources or strategic storages. Sweden, for example, not being able to construct a domestic underground storage, used interruptible contracts as an alternative method of improving efficiency and security of its gas system. Finland is also a case in point.

Interruptible users were mainly large factories and power plants. Stockpiling of coal and oil were the most common forms, and the users in questions were either large industrial companies or electric power plants. The same method was also used as a way of increasing the load factor, so that natural gas was used, for example, in a power plant only during certain hours of the day or certain months of the year, when the gas demand among other consumers was low. An interesting case is Leningrad's gas supply. Situated on the far end of a pipeline that stretched from the northern Caucasus over Moscow to the former Imperial capital, the Soviets developed a regime according to which Leningrad's pattern of use was to be the reverse of Moscow's. Hence Leningrad's gas decreased in winter (when demand was high in Moscow) and increased in summer. The arrangement was thus such that Leningrad received the volumes that Moscow did not need.

The European vulnerability geography: The East-West divide

Which parts of Europe have been most vulnerable to critical events in natural gas, such as interruptions in gas supply? Western Europe's fear of falling victim to interruptions in supplies from the East did not come true during the Cold War. The Soviets had difficulties to supply gas for exports during a few initial years, but from 1974 the impression in the West was that the Soviet Union had eventually proved a trustworthy partner, since all contracted volumes were delivered precisely.⁶⁵ Nevertheless, worries among the population in importing countries and pressure from the political level forced gas companies to implement security mechanisms of the types discussed above. Expensive security-related projects were thereby often co-funded by the state.

West European fears of supply disruptions from non-Western exporters also stimulated and boosted the process of strengthening the links between gas networks of member countries. Several West European politicians, notably in West Germany,

argued that a close West European cooperation in the construction of a unified gas transmission infrastructure was necessary in order to make it possible, in the case of supply interruptions from the Soviet Union or Algeria, for those regions affected to quickly get access to gas sources from elsewhere in the larger system – i.e. from other member states. Fritz Burgbacher, a prominent German member of the European Parliament and Deputy Chairman of the Economic Committee of the NATO Parliament, argued that gas produced in EEC member countries should be regarded as “domestic”. A central task for strengthening security of supply would then have to be the construction – with the NATO contributing financially – of a unified EEC gas grid, “so that the balancing of our energy supply with neighbour states and allied, which is especially necessary in the case of crisis, can be carried out”.⁶⁶ It was thus seen as possible to reduce vulnerability to interruptions in gas supply from outside Western Europe by way of a deeper integration among the West European countries themselves. Western European gas integration was thus boosted by a perceived vulnerability to interruptions from the outside. In other words, “Western Europe” in natural gas was largely a product of perceived vulnerability.

While importers in Western Europe thus built effective protection mechanisms for countering disturbances both nationally and at the EEC level, the most vulnerable gas users in the context of the East-West gas trade were, paradoxically, gas users in the Soviet Union itself. This was because users in these Soviet regions competed directly with Western importers for scarce Soviet gas resources. The Soviet gas ministry thereby faced the delicate choice of either breaking its export commitments or sacrificing the gas supply to industries and households in the Soviet Union itself. The Soviets chose the second variant.

The result was devastating for industries as well as for the local population not only in western Ukraine, but also in Belarus, Lithuania and Latvia – all of which competed with Austria and Czechoslovakia for access to the scarce Galician gas. Latvia appears to have been most severely affected, since it was located at the remote end of the Galicia-Minsk-Vilnius-Riga pipeline. Families found themselves living in ice-cold houses without cooking possibilities. Many industries were forced to a stand-still as logistical failures prevented them from accessing sufficient volumes of reserve fuel in the form of oil or coal. The local population used the local communist party organizations to ventilate their anger, and desperate letters were sent to Moscow, begging the country’s leaders to force the gas ministry to improve the situation.⁶⁷

Gas users in the Soviet Union faced an increasingly problematic situation due to the anarchic chaos that followed in times when supply failed to match demand. Gosplan, the powerful Soviet planning organization, in cooperation with the gas ministry worked out detailed lists that prescribed how much gas a certain factory was allowed to use in case of a critical event. But the instructions were rarely followed and users located on the far end of pipelines became defenceless victims, despite repeated attempts from Moscow to prevent upstream users from using more gas than they were entitled to.

The completion of large pipelines from Siberia made the East-West gas trade more reliable. But still it was far from harmonic. In the stagnating Soviet economy, investments and maintenance of the export pipelines and compressor stations was often neglected. The result was frequent accidents, explosions and temporary

interruptions of a “technical” nature. West European countries, which had always been suspicious of Soviet gas deliveries, though from a political rather than from a technical point of view, were well protected against these temporary breakdowns. In Central Europe, however, where gas storage facilities and other emergency arrangements were often missing, industries and households were directly affected. In the post-Soviet era, this historical legacy continued to play a major role in shaping Europe’s gas vulnerability geography, with the post-communist countries of Central and Eastern Europe most severely affected by the recurring Russian-Ukrainian gas crises.

Europe through the lens of natural gas

Europe’s vulnerability geography, as outlined above, can be taken as evidence of an East-West divide in Europe’s natural gas history. Obviously, vulnerability was not so much influenced by the behaviour of suppliers, but more by the overall functioning of economy and society in the user regions, along with the extent to which a region or a country possessed mechanisms for countering gas disruptions. Against this background it is not surprising to find a strong correlation between the ways in which countries were affected by supply problems and their political and economic system. From this perspective the history of natural gas can arguably be said to fit with the view of Cold War Europe as a continent radically divided between East and West: on the one side the communist, centrally-planned economies that were members of the COMECON and the Warsaw Pact; on the other side the capitalist, market-centred economies, most of which were members of the EEC and the NATO.

However, the *differences* between East and West in terms of vulnerability did not mean that the two were *isolated* from each other. Radical differences in technological style between gas systems in East and West did not prevent the two from becoming deeply integrated with and dependent on each other. In other words, although the Iron Curtain supported a division in terms of style, it did not raise barriers high enough to prevent system-builders from putting an infrastructure in place that spanned the continent and on which industries, power plants, municipal institutions and households became highly dependent for their daily activities.

Thus the history of the European natural gas system has been characterized by close and long-term transnational cooperation that does not follow the “Iron Curtain”. Austria, Italy and Bavaria became part of the Soviet-based natural gas system before they linked up with the Dutch- and North-Sea based infrastructures, and they became more dependent on Soviet than on Dutch and North Sea gas. Greece, a NATO and EEC member, came to rely on Soviet gas only, as did Finland.

The Cold War era was also one of decolonization in Northern Africa, with bitter independence wars and strained relations between the new African states and the former colonial powers, particularly France, for whom the loss of Algeria became a deeply traumatic experience. Independent Algeria embarked on a new, radical development that made its political and economic situation radically different from and partly hostile to the French. Nevertheless, France started importing Algerian natural gas much earlier than Dutch gas and became more dependent on it. Spain also became tightly linked up with Algeria, while remaining delinked from the rest of Western Europe. All in all, it thus proved possible to build pipelines between

countries which one would perhaps not have expected to cooperate. Conversely, possible pipelines between countries that were close to each other in a political and cultural sense were often not built.

If a divided Europe is to be constructed analytically on the basis of transnational dependencies, it is a Europe consisting of three major meso-regions, defined by their major source of natural gas. These regions can be labelled Eurasia, Eurafrica and North Sea Europe. The boundaries between them have evolved and continue to evolve over time, a process that might be regarded as a “hidden regionalization”. The boundaries between the gas regions do rarely coincide with national borders; the major division lines cut through the hearts of Germany, France and Italy. Regions such as Bavaria, northern Italy and most of Austria, as well as Finland, appear seamlessly integrated with the rest of Eurasia. France can from this perspective be regarded as the European nexus; it is here that the three regions meet. This is reflected statistically in the fact that France, at the national aggregate level, is the most diversified country in terms of sources of supply.⁶⁸

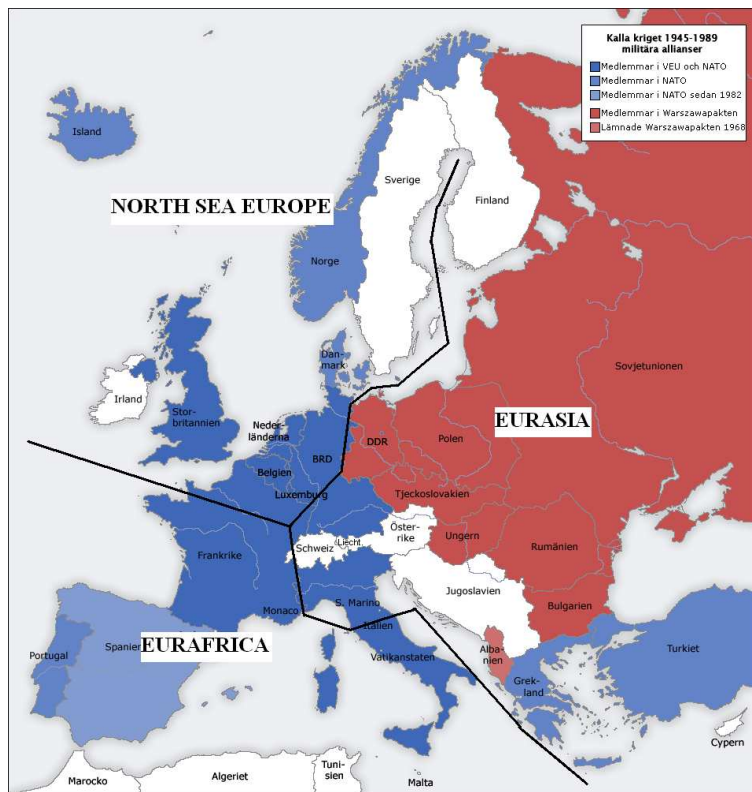


Figure 6. European mesoregions for natural gas, by major source.

Some European regions, however, were not part of any regions at all; they remained white spots on Europe’s natural gas map. To these belonged, throughout the Cold War era, most of Poland, which for a long time was not integrated to any significant extent with any of the meso-regions. Today, the main remaining white spot on the map is formed by a large part of Scandinavia where natural gas is not used at all. Despite a long tradition of cooperation and a sense of cultural community, the Nordic countries have failed, with the exception of the Danish-Swedish pipeline, to create a

transnational gas infrastructure. This must be regarded as highly intriguing, especially when contrasted to the deep integration across the East-West political divide.

To a certain extent the major gas pipelines in and to Europe can be said to follow routes that lead rationally and logically from major gas producing regions to major gas consuming regions. It is important to remember, however, that Europe's natural gas geography could have looked different. For example, Dutch, Algerian and North Sea gas could have supplied all of Germany, France, Austria and Italy, making these countries independent of deliveries from the Soviet Union. There were no objective pressures or arguments that compelled these countries to engage in natural gas imports from certain and not other regions. The importers' choice of partners was deliberate, and might have been different if other system-builders, with different visions and different world-views, had been involved.

The choice to import large volumes of Soviet gas seemed controversial in challenging the post-war ideological divide, but it seems less surprising if seen in a longer historical perspective. Natural gas was but the latest among the raw materials and agricultural products that for centuries had been traded between imported from the East and which had formed part of the backbone of Europe's economic geography. In particular, Western Europe's import of Soviet natural gas built on a long tradition, stretching back to the mid-19th century, of importing Russian coal and oil.

The attempts from the side of the United States to prevent Western Europe from trading with the communist bloc became a major hallmark of the Cold War period. West European countries themselves were less inclined to give up their Eastern trade relations, with their deep historical roots, for the sake of ideological and military considerations. From this perspective, the struggle about imports of Soviet natural gas was also a struggle about what Europe should be. Washington preferred a divided Europe and sought, instead, to favour a tightly integrated mini-Europe in the West, which was to be closely linked to North America. In contrast, most European countries, judging from our material, regarded a much more open Europe, with large-scale flows of energy and technology between East and West, as the natural and historically justified option. As we have seen, key actors from Rudolf Lukesch in Austria to Otto Schedl in Bavaria to Enrico Mattei in Italy explicitly sought to use their historical traditions of trading with the East when attempting to link up with the Soviet natural gas infrastructure. They were not only pragmatic, but also historically aware and culturally sensitive personalities whose world views – and views of Europe – differed markedly from those of Dwight Eisenhower or Ronald Reagan.

The United States, often by way of CoCom and NATO, at times sought to deliberately prevent natural gas imports to European NATO members from the Soviet Union. At the formative moment, however, i.e. in 1969, when the first German and Italian contracts were negotiated with the Soviet Union, Washington opted to take a passive stance. This seemed to fit with the more relaxed relations between the two superpowers at the time. Esso, as an American oil and gas company for which Soviet gas exports was seen as unwanted competition, sought in vain to persuade the Nixon administration of the dangers and uncertainties associated with Soviet gas exports to NATO member countries.⁶⁹ Washington's stance gradually changed and the differing perspectives of the United States and its European allies became particularly obvious, as we have seen, from the early 1980s. At that time, however, the momentum of the

natural gas infrastructure had reached a very high level and the East-West gas trade continued to expand.

The natural gas story thus demonstrates how Europe during the Cold War, which also coincided with the transition from colonial to post-colonial relations, was able to build on economic and cultural experiences from the past to overcome enormous political and military divides.

At the same time, we find an interesting relationship between the “hidden integration” of Europe, in the form of the construction and use of a transnational gas infrastructure, and the politically and economically more visible integration that proceeded in parallel. For the Soviets, for example, the incorporation of Austria into the East European natural gas system – at a time when this country was pushing for an association with the EEC – became a way of counteracting the overall political trend of West European meso-integration.⁷⁰ In the same way, Egon Bahr and Willy Brandt in Germany deliberately sought to place the German-Soviet natural gas negotiations into the framework of developing a new German “Eastern policy” from 1967. Natural gas was thus an integral part of broader political developments in Europe.

The latter aspect also applies to developments within the Soviet Union and the COMECON region. Here, transnational gas networks were of a certain significance both politically and symbolically. After World War II, the emerging all-Soviet natural gas system became a very concrete and material way of integrating the newly annexed Soviet territories with the rest of the country, tying Galicia (in what had been eastern Poland) and the three Baltic countries (which had become three Soviet republics) to Belarus and central Ukraine. Natural gas became a tool of Sovietization and an instrument in erasing the perceived Europeaness of Galicia and the Baltics. Stimulating a system-building process that made the union republics highly dependent on each other for their gas supply, the Kremlin also fostered a perceived vulnerability of these republics to attempts at breaking out of this emerging system. From the early 1960s, Moscow proceeded by seeking to extend the emerging transrepublican system of gas dependencies to the communist satellite states in Central Europe. The Soviets complemented this strategy by preventing the Central European countries from signing import contracts with other suppliers in Western Europe or North Africa. Moreover, the Soviets succeeded in turning the construction of transnational gas networks into a showcase of successful cooperation within the COMECON.

¹ For a good discussion of the 2006 gas crisis, see Michael Fredholm, *Gazprom in Crisis*. Conflict Studies Research Centre, Russian Series 06/48, Defence Academy of the United Kingdom, October 2006, 4ff.

² See International Energy Agency, *Security of gas supply in open markets. LNG and power at a turning point* (Paris: IEA, 2004): 317-319.

³ The focus has then been on, for example, the functioning mechanisms of the natural gas market, on effects of liberalization, on policy aspects of the natural gas network building, on game-theoretical analyses of the interdependent relationships between East and West, on comparisons between the organization of the natural gas industry in different countries, on natural gas in an energy economy perspective, on the competitiveness of natural gas in relation to other energy sources, on problems in price formation within the gas industry, etc.

⁴ To the promising exceptions belong Hayes’s study of the Transmed and Maghreb pipeline projects that linked Algeria with Italy and Spain, respectively (Hayes, M. 2006, “The Transmed and Maghreb projects: gas to Europe from North Africa”, in Victor, D., Jaffe, A. and Hayes, M. (eds.), *Natural Gas and Geopolitics. From 1970 to 2040*. Cambridge: Cambridge University Press) as well as Kaijser’s

studies of the emergence of the Dutch natural gas regime (Arne Kaijser, “Striking Bonanza. The Establishment of a Natural Gas Regime in the Netherlands”, in Olivier Coutard, ed., *Governing large technical systems*, London: Routledge, 1999, pp. 38-57) and of gas and electricity in comparative Nordic perspective (Arne Kaijser, “Trans-border integration of electricity and gas in the Nordic countries, 1915-1992”, *Polhem: Tidskrift för teknikhistoria*, 15, 1997, pp. 4-43). There is also an interesting literature on the history of gasworks and gas production, although the focus is here usually less on gas as an infrastructure or system, nor on transnational aspects. A good collection of case studies of early gas histories from various parts of Europe is provided in Serge Paquier and Jean-Pierre Williot, eds., *L’industrie du gaz en Europe aux XIXe et XXe siècle. L’innovation entre marchés et collectivités publiques* (Bruxelles: Lang, 2005).

⁵ With the exception of West Germany, where we were not granted access to original documentation from Ruhrgas, we have studied documents from both governments and gas companies. Regarding governments, we have sought access to the archives of both economy and foreign ministries, although in the Russian and Ukrainian case, we were not granted access to the foreign policy collections.

⁶ There is a – perhaps important – “linguistic divide” in Europe regarding the methane terminology. The term ‘natural gas’ is used in English, Greek, Turkish and most Romanic, Nordic and East Slavic languages (gaz naturel, naturgas, природный газ, φυσικό αέριο, etc.), whereas Dutch, German, Finnish, Estonian and most West and South Slavic languages use the notion of “earth gas” (Erdgas, aardgas, maagaas etc.). It is notable that this divide goes straight through the former Yugoslavia, with Bosnian, Serbian, Slovenian using “earth gas” (zemni plin, zemni gas, zemeljski plin) but Croatian using “natural gas” (prirodni plin).

⁷ By adding nitrogen to natural gas, the latter could also be used as a gaseous fuel with coal gas quality.

⁸ BayHStA, Nachlass Schedl, Box 200. References to the ECE are common in all major branch journals from the late 1950s, such as *Oil and Gas Journal*, *Gazovaya promyshlennost* and *gwf*.

⁹ M. Hayes, “The Transmed and Maghreb projects: gas to Europe from North Africa,” in Victor, D., Jaffe, A. and Hayes, M. (eds.), *Natural Gas and Geopolitics. From 1970 to 2040* (Cambridge: Cambridge University Press, 2006).

¹⁰ *gwf*, vol. 107, no. 19, 20 May 1966, p. 531.

¹¹ Rambousek, *Die ÖMV-Aktiengesellschaft – Entstehung und Entwicklung eines nationalen Unternehmens der Mineralölindustrie*, PhD thesis, Wirtschaftsuniversität Wien, 1977, p. 79f

¹² The first major Siberian gas fields were confirmed in 1962 and 1964. In 1965 the first supergiant field, Zapolyarное, was discovered, which boosted both Soviet and foreign interest in bringing Siberian gas westwards.

¹³ The ENI subsidiary SNAM Progetti exported several large gas refineries to the Soviet Union in the early 1960s. See Semichastnov, Deputy Minister of Foreign Trade and Sidorenko, Deputy Minister of Gas Industry, to the Soviet Council of Ministers, 11 August 1966, RGAE 458-1-103.

¹⁴ The decision is extensively quoted by gas minister Kortunov in a letter to the Soviet Council of Ministers, 5 October 1966, RGAE 458-1-109.

¹⁵ Niederschrift über die 3. ordentliche Aufsichtsratssitzung/Geschäftsjahr 1966 der VÖEST AG, abgehalten am 24. Oktober 1966, OeStA AdR ÖIAG-Archiv, Box 325; Willy H. Schlieker to the German Foreign Office, 12. Dezember 1966, BArch B102-152193.

¹⁶ For a detailed analysis of the pipe embargo, see Karsten Rudolph, *Wirtschaftsdiplomatie im Kalten Krieg: Die Ostpolitik der westdeutschen Grossindustrie 1945-1991* (Frankfurt: Campus Verlag, 2004).

¹⁷ Otto Schedl, Warum Osthandel? Ansprache vor dem Union International Club e.V. am 20.

September 1967 in Frankfurt/Main, BayHStA NL Schedl, Box 188.

¹⁸ Grimm, 23 January 1967 and Plessner, 27 January 1967, BArch B102-152193.

¹⁹ This interpretation was made by, for example, Willy H. Schlieker, a semi-retired high-level German insider in the steel industry and an advisor to the Federal government. See Schlieker to the Foreign Office, 12 December 1966, BArch B102-152193.

²⁰ After an intense struggle, it was Ruhrgas rather than Schedl and the regional gas company Bayerngas that took control over the negotiations with the Soviet side. Similarly, Ruhrgas insisted that it and not Bayerngas would build and operate the new transnational pipeline infrastructure – despite the fact that this infrastructure was to be built on Bavarian territory, where Ruhrgas had no operations, and with the gas destined mainly for Bavarian users.

²¹ Plessner to Lantzke, 19 August 1969, BArch B102-152193.

²² Tuuja Mikkonen, “Vulnerability, reliability, and security of critical Finnish-Soviet energy infrastructures”, paper presented at Eurocrit workshop, Stockholm, 21-24 May, 2008, 2, 8

²³ *Ibid.* p. 8

- ²⁴ Telegram from the Swedish Embassy in Helsinki to the Swedish Foreign Ministry, May 5, 1971, RA, H53:40 Er, Dossier 7.
- ²⁵ Janne Haaland Matlary, "Gas trade in Scandinavia: Will political factors matter?," in *Naturgasmarknader i Norden* (Gothenburg: Gothenburg University, Department of Economic History/NUPI Norsk Utenrikspolitisk Institut, 1988): 13
- ²⁶ Cf. Michael Damian, "Nuclear Power: The ambitious lessons of history", *Energy Policy*, July 1992, pp. 596-607.
- ²⁷ "Sovjetrapporten", Arbetsutkast, Swedegas AB, p 5, Swedegas Archives; Jonathan P. Stern, *Soviet Natural Gas Development to 1990: The Implications for the CMEA and the West* (Lexington, MA: Lexington Books, 1980).
- ²⁸ *Ibid.* This insecurity regarding the supply status at the time was due to both production shortfalls and to a gas contract that the Soviet Union had concluded with Western Germany in the meantime.
- ²⁹ Examples of Swedish pipeline projects that were not completed are (among many others) the PGT-pipeline from northern Norway through Sweden to Denmark, and a pipeline connecting Sweden to the Finnish grid through a pipeline across the Baltic Sea.
- ³⁰ CIA, Office of Soviet Analysis, 9 February 1982, "Overview of the Siberia-to-Europe Natural Gas Pipeline", p. 1.
- ³¹ Plessner, 27 January 1967, BArch B102-152193.
- ³² Government Bill 1978/79:115. p. 154-156.
- ³³ Plessner, "Besprechung bei Herrn Staatssekretär Dr. von Dohnanyi am 3.7.1969", 10 July 1969; Schöllhorn to Franz, 12 May 1970. BArch B102-152194.
- ³⁴ Lumpe, 3 July 1972, BArch B102-152196.
- ³⁵ International Energy Agency, *Security of gas supply in open markets. LNG and power at a turning point* (Paris: IEA, 2004): 318.
- ³⁶ The construction of an additional East-West pipeline through Belarus and Poland continued to be debated throughout the 1970s and 1980s, but it was only after the end of the Cold War that it could be realized.
- ³⁷ As reported by VGW, Aktennotiz über ein Gespräch am 26.4.1967 in Frankfurt/Main betreffend Erdgaslieferung aus der UdSSR in die Bundesrepublik. VGW was represented by Dr. F. Gläser and Mr. H. Utzerath. BArch B102-152193.
- ³⁸ As discussed, for example, by Wedekind, "Einfuhr sowjetischen Erdgases", 16 May 1969, BArch B102/152194
- ³⁹ ÖMV and Soyuznefteexport, Vertrag über die Lieferung von Erdgas, Vienna, 1 June 1968, OeStA AdR ÖIAG-Archiv.
- ⁴⁰ Cf. J.D. Davis, *Blue Gold: The Political Economy of Natural Gas* (London: Allen & Unwin, 1984); Javier Estrada et al., *Natural Gas in Europe: markets, organisation and politics* (London: Pinter, 1988). See also Protocol concerning the delivery of natural gas from the Soviet Union to Finland, May 21, 1971, RA, H53:40 Er, Dossier 7 (here the term used is "competing fuels").
- ⁴¹ For the Soviet-Austrian case, see ÖMV and Soyuznefteexport, Vertrag über die Lieferung von Erdgas, Vienna, 1 June 1968, OeStA AdR ÖIAG-Archiv. In the Swedish-Danish case, the section on Force Majeure, enumerating the different critical events that could be envisioned, stated that none of these events were to be considered a legitimate reason for breaking the contract. Instead, the contract could be suspended, or the problems solved through mutual aid.
- ⁴² Gas transportation contract between Dansk olie og Naturgas and Swedegas AB of February 1980.
- ⁴³ Torkel Ösgård, author interview, 2008-05-30, Michael Schultz, author interview, 2008-11-11, Protocol concerning the delivery of natural gas from the Soviet Union to Finland, May 21, 1971, RA, H53:40 Er, dossier 7
- ⁴⁴ ÖMV and Soyuznefteexport, Vertrag über die Lieferung von Erdgas, Vienna, 1 June 1968, OeStA AdR ÖIAG-Archiv; Protocol concerning the delivery of natural gas from the Soviet Union to Finland, May 21, 1971, RA, H53:40 Er, dossier 7
- ⁴⁵ Arne Kaijser, "Striking Bonanza. The Establishment of a Natural Gas Regime in the Netherlands", in Olivier Coutard, ed., *Governing large technical systems*, London: Routledge, 1999).
- ⁴⁶ Plessner, "Deutsch-sowjetische Erdgasverhandlungen über die Lieferung sowjetischen Erdgases am 31.7. und 1.8.1969 in Moskau", 7 August 1969, BArch B102/152194.
- ⁴⁷ This was observed by, for example, VÖEST in Austria. See Niederschrift über die 2. ordentliche Aufsichtsratssitzung/Geschäftsjahr 1967 der VÖEST AG, abgehalten am 29. Juni 1967, OeStA AdR ÖIAG-Archiv, Box 325.
- ⁴⁸ See e.g. Protokoll über das Gespräch mit Ministerpräsident Kossygin am 19. März 1967, OeStA AdR, II-Pol, UdSSR 1967.

- ⁴⁹ Minutes from Danish-Swedish deliberations concerning a natural gas cooperation, from June 1979 onwards.
- ⁵⁰ Memo from Jan Thyberg to the foreign ministry, February 12, 1979, Poul Nielson, author interview, April 1, 2008, Carl-Axel Petri, author interview, May 29, 2008.
- ⁵¹ J.D. Davis, *Blue Gold: The Political Economy of Natural Gas* (London: Allen & Unwin, 1984) claims that the ECE "has a largely toothless informational role and confines its activities to the issues of periodic statistical and technical reports", J.D. Davis, *Blue Gold: The political Economy of Natural Gas*, (London: George Allen & Unwin, 1984):152.
- ⁵² See e.g. William R. Connole, "Will Europe Come to Depend on Russian Natural Gas?", *Oil and Gas Journal*, 28 August 1961, p. 60, and Alois Bauer, "Die Gaswirtschaft der Europäischen Wirtschaftsgemeinschaft am Jahresanfang 1967", *gwf*, vol. 108, no. 21, May 1967, p. 594.
- ⁵³ Klaus H. Dahl, *Erdgas in Deutschland. Entwicklung und Bedeutung unter Berücksichtigung der Versorgungssicherheit und des energiepolitischen Ordnungsrahmens sowie des Umweltschutzes*, PhD dissertation, Technische Universität Clausthal, 1998.
- ⁵⁴ See e.g. Hankel to Schiller, 21 January 1970, BArch B102/152194.
- ⁵⁵ Plesser, "Deutsch-sowjetische Erdgasverhandlungen über die Lieferung sowjetischen Erdgases am 31.7. und 1.8.1969 in Moskau", 7 August 1969, BArch B102-152193.
- ⁵⁶ Klaus H. Dahl, *Erdgas in Deutschland. Entwicklung und Bedeutung unter Berücksichtigung der Versorgungssicherheit und des energiepolitischen Ordnungsrahmens sowie des Umweltschutzes*, PhD dissertation, Technische Universität Clausthal, 1998, p. 62.
- ⁵⁷ Staatsminister Anton Jaumann to Rudolf Hanauer, Präsident des Bayerischen Landtages, 21 December 1972, BayHStA MWi, Box 27208.
- ⁵⁸ This issue was debated in the regional Bavarian parliament in 1974 and 1975. See Bayerischer Landtag, 23 January 1974, 20 February 1974 and 26 February 1975. BayHStA StK, Box 18790. The Netherlands, in contrast to Germany, invested in an expensive transformation station at Ommen, where nitrogen was mixed with high-calorific gas from the North Sea for making it compatible with other Dutch gas.
- ⁵⁹ V. Ruben, Chairman of the Latvian Council of Ministers to the Soviet Council of Ministers, 11 April 1967, "O stroitelstve vtorogo gazoprovoda v Latvijkskuju SSR", RGAE 458-1-495.
- ⁶⁰ Niederschrift über die Sitzung des Arbeitsausschusses des Aufsichtsrates der ÖMV AG am 17. September 1969; ÖMV, Bericht über das 1. Quartal 1971, OeStA AdR ÖIAG-Archiv.
- ⁶¹ Справка о перспективе газоснабжения г. Киева в зимний период 1968-1969 г.г., 3 September 1968, TsDAVO Ukrainy, 337-3-20.
- ⁶² ÖMV ARS-Sitzung, 21 September 1970; ÖMV, Bericht über das 1. Quartal 1971. OeStA AdR ÖIAG.
- ⁶³ [Add REF Landesarchiv Berlin...](#)
- ⁶⁴ Agreement on the storage of natural gas between Dangas and Swedegas of October 1, 1989. Swedegas Archive.
- ⁶⁵ The Soviets also concluded that in contrast to previous years, 1974 was the first year when the country's export obligations could actually be met. See Orudzhev and Shcherbin to the Soviet Council of Ministers, 22 January 1975, "Ob itogax vypolneniya plana postavok sovetskogo prirodnogo gaza na eksport v 1974 godu", RGAE 458-1-3963.
- ⁶⁶ Burgbacher cited in *gwf*, vol. 108, no. 51, p. 1462, 22 December 1967, "Energieprobleme in Europa – Möglichkeiten ihrer Lösung".
- ⁶⁷ Е.г. Генеральному Секретарю ЦК КПСС, тов. Брежневу Л.И., 11.12.1973, "Жалова", signed by around 50 inhabitants in the town, TsDAVO Ukrainy, 337-15-440.
- ⁶⁸ See e.g. International Energy Agency, *Security of gas supply in open markets. LNG and power at a turning point* (Paris: IEA, 2004): 317-319. France imports 98% of its gas supplies, but the imports come from Norway, the Netherlands, Algeria and Russia, with Norway being the single largest exporter with a share of 27%.
- ⁶⁹ Furthermore, when Italy negotiated a second Soviet gas contract in 1971, the Dutch Minister of Foreign Affairs, Joseph Luns, sought to persuade the US government that such an increased dependence on Soviet gas posed a danger to the NATO, and that Italy had better import the gas from the Netherlands, too. The volume at stake was 6 bcm of Soviet gas to be delivered annually for a 20-year period, and the Netherlands wished to supply another 6 bcm. In this way the NATO-member Italy, with the strongest Communist Party in Western Europe, would avoid becoming totally dependent on Soviet gas deliveries. But Italy used its political bargaining position skilfully and the gas price in this contract was substantially lower than in previous contracts that Gasunie had made. A few months after the contract had been signed, Joseph Luns was appointed general secretary of the NATO and remained

in this function for a long time, until 1984. See F. Salverda and V. Bakker, “De jacht op ons aardgas”, *Vrij Nederland*, 15 januari 1983, p. 17f.

⁷⁰ This interpretation was made by, for example, Willy H. Schlieker, a semi-retired high-level German insider in the steel industry and an advisor to the Federal government. See Schlieker to Foreign Office, 12 December 1966, BArch B102-152193.