



THE IMPACT OF THE ECONOMIC CRISIS ON RUSSIAN AND CIS GAS MARKETS

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Preface

As our book on CIS gas markets, edited by Simon Pirani¹ was being completed in late 2008, it was already clear that recession storm clouds were gathering. By the time the book was published in early 2009, the global impact of the recession and specific impacts on CIS countries, had become clearer and had the potential to change some of the shorter term conclusions in the book. At that point, Simon and I agreed that it would be sensible to “rewrite the conclusions” of the book in the wake of global recession, and this study is the result of that decision.

In addition to recession and demand and production decline much else has happened in CIS gas markets during 2009. The January 2009 Russia-Ukraine crisis and its aftermath was a seminal event which caused significant aftershocks in Europe as well as in the countries themselves. The hiatus in Turkmen-Russian gas relations in the wake of the April 2009 pipeline explosion appears to have dramatically reduced the prospects for large scale gas trade between the countries, at least in the short term. In Russia, Gazprom appears to have borne the brunt of the reduction in gas production, which may be close to 90 Bcm in 2009, caused by demand decline in CIS and European markets.

This study is designed to address these and other events which have arisen during 2009 in respect of CIS gas markets, many of which have consequences for European countries. In so doing, it illustrates many of the trends set out in the book and provides readers with a valuable update of what has been an extremely turbulent and eventful year.

Jonathan Stern

December 2009

¹ Simon Pirani (ed.), *Russian and CIS Gas Markets and Their Impact on Europe* (Oxford, Oxford University Press, 2009).

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1. INTRODUCTION

This article presents an overview of the impact of the current world economic crisis on natural gas markets in Russia and the CIS. It will discuss two types of changes that reflect broader international trends. *First* are the initial consequences of the recession that was triggered by the US financial crisis of September 2008: sharp falls in gas consumption, which have produced oversupplied markets and falling prices; cuts in production and investment; and intensified competition between suppliers. *Second* are deep-going changes that could result over the longer term, as these impacts of the recession combine with other factors. The recovery of demand, however long it takes, will be accompanied by trends such as (i) technological advances, for instance those allowing the economic recovery of unconventional gas reserves, which could in time spread beyond the US; and (ii) changes in market structure, and particularly the increasing availability of liquefied natural gas (LNG), which will have consequences for regional markets for pipeline gas.

The recession has had a substantial immediate impact on the gas sector internationally. For *demand*, industry projections of the total reduction for 2009 are around 5%. In the four months to April, gross consumption in the OECD countries, which account for about half of the world total, fell by 5.2% year-on-year. For *production*, Cedigaz has projected that the 4% increase in 2008 will “practically be wiped out” in 2009. For *investment*, the IEA has estimated that in 2009 budgeted capital expenditure in the oil and gas upstream is about 21% down year-on-year.²

This article surveys the impact of the crisis in Russia and the CIS countries. It also continues the discussion of themes presented in a multi-author survey of Russian and CIS gas markets edited by the author, work on which was completed just as the crisis began.³ Trends up to 2020 are discussed. Sections 2, 3 and 4 deal respectively with demand; markets and pricing; and production and competition between Russian and Central Asian suppliers. Section 5 covers investment. Section 6 discusses the Russo-Ukrainian gas dispute that resulted in the suspension of deliveries to European countries in January 2009, which was far the most serious “gas war” to date and of which the economic crisis was an important cause. Finally conclusions are presented.

² IEA, *Monthly Natural Gas Survey*, April 2009, p. 6; Doris Leblond, “Cedigaz: Global recession to offset gas supply gains”, *Oil & Gas Journal*, 1 July 2009; IEA presentation, “The Impact of the Financial and Economic Crisis on Global Energy Investment”, G8 Energy Ministerial Meeting, Rome, 24-25 May 2009.

³ Simon Pirani (ed.), *Russian and CIS Gas Markets and Their Impact on Europe* (Oxford, Oxford University Press, 2009). Many themes in this article are treated in more detail in chapters of the book.

2. THE IMPACT OF THE CRISIS ON DEMAND

In recent years, exports to destinations outside the CIS, mostly in Europe, have accounted for about one-fifth of CIS gas production (about 170 Bcm/year of the 830-850 Bcm/year produced). But the much higher prices paid in export markets mean that the exports play a disproportionate role in revenue terms. For Gazprom, the predominant exporter, sales outside the CIS accounted in 2008 for just under one-third of gas volumes, but for more than two-thirds of revenues from gas sales. (See Appendix, Table 7, for exact proportions.) The blow from falling export sales has been correspondingly severe. Consequently I deal here first with demand in export markets, and then with demand in Russia and the CIS.

2.1 European and other export markets

The European market (including Turkey) accounts for all CIS gas exports to non-CIS destinations, apart from Turkmen gas exported to Iran (5-8 Bcm/year in recent years), and Russia's LNG sales from the Sakhalin II project in the Far East, which started in February (projected to reach 5 million tonnes this year). CIS export sales to Europe are effectively a Gazprom monopoly.⁴ The sharp reduction of demand in Europe therefore hits at the heart of Russia's gas export business.

Demand has fallen more sharply in Europe than in the other major importing regions. In the first half of 2009, it was down by 7.6% year-on-year.⁵ Industry projections see demand in the European Union (EU) falling by 6% this year, compared to a 2.3% drop in the US and a 0.5% drop in Japan; they see total consumption in the EU-27 falling from 513 Bcm in 2008 to 482 Bcm in 2009. The fall in demand directly reflects reduced economic activity: it is estimated that the year-on-year fall in consumption will be 13% in the power sector and 12% in industry, while it will rise by 6% in the residential sector. The fall in industrial production in Europe's largest markets was the main cause: during 2009, monthly industrial production indicators for the EU27 were down year-on-year in a range of 15-22%; in August 2009 industrial production in the EU27 was down 13.5% year-on-year,

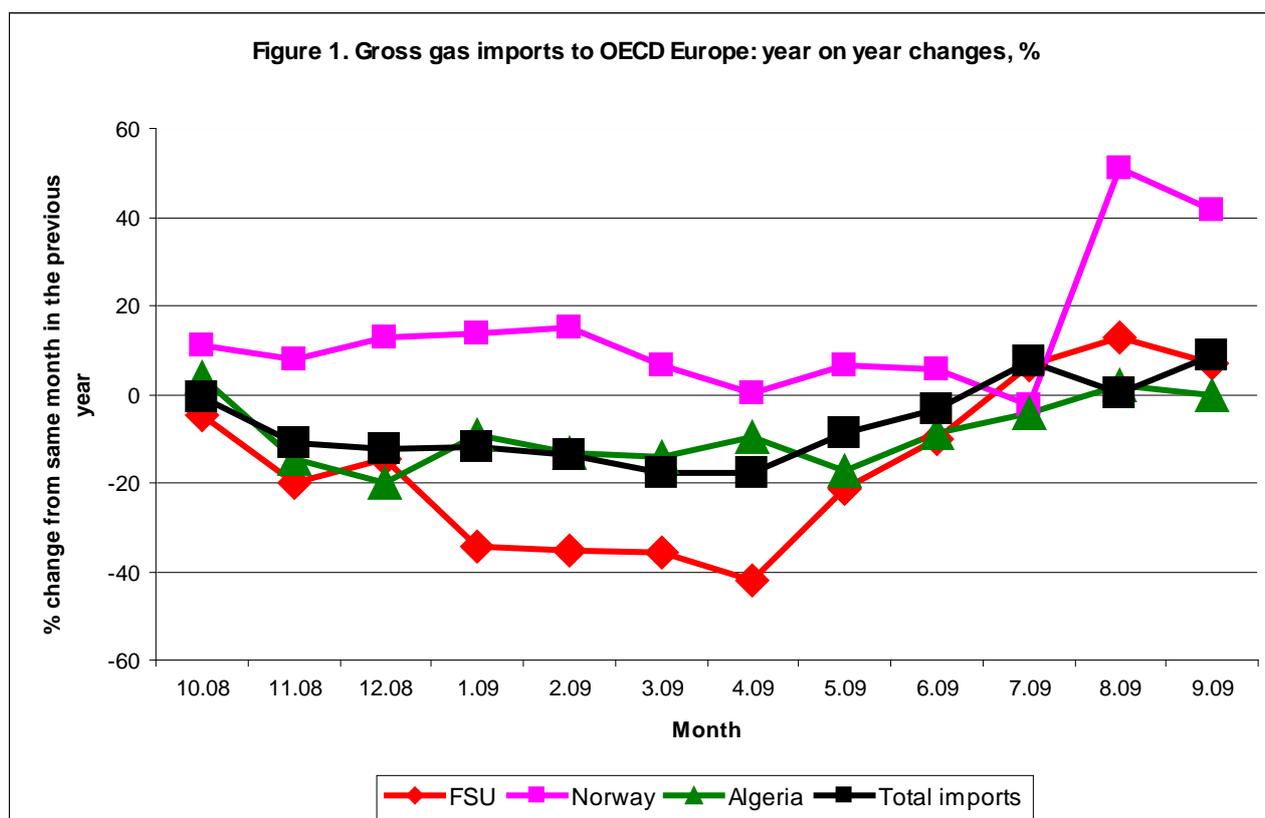
⁴ Until the end of 2008, the trader Rosukrenergo sold 7-10 Bcm/year of central Asian gas into central Europe, but it effectively ceded these to Gazprom when it exited the Ukrainian transit business. For details, see Simon Pirani, Jonathan Stern and Katja Yafimava, *The Russo-Ukrainian Gas Dispute of January 2009: A Comprehensive Assessment* (Oxford, OIES, February 2009), pp. 12 and 41-42.

⁵ IEA monthly data/Howard Rogers (OIES).

with year-on-year falls of 18.0% in Germany, 10.3% in France, 13.1% in Spain and 7.6% in the UK.⁶

The fall in European demand had a disproportionate impact on imported gas, and the fall in imports had a disproportionate impact on imports from the CIS. From the fourth quarter of 2008, European consumers not only bought less gas in general, but also diversified away from purchases of gas from the CIS, and to a lesser extent gas from Algeria, in favour of purchases from Norway and EU producers. The results are reflected in statistics for imports of gas into OECD Europe, which includes all the largest European consuming countries: these imports were down 9% year-on-year in the fourth quarter of 2008 and down 12.4% year-on-year in the first half of 2009. But imports from the former Soviet Union (FSU) to OECD Europe fell much more steeply: they were down 13% year-on-year in the fourth quarter of 2008 and down 30.6% year-on-year in the first half of 2009. The dramatic fall is illustrated in Figure 1, which shows the monthly level of imports as compared to the same month a year earlier. (Monthly statistics are provided in full in the Appendix, Table 8.)

Figure 1: Gross Gas Imports to OECD Europe: year on year changes (%)



Source: IEA, *Monthly Natural Gas Survey*, various issues; Table 8 below

⁶ Eurostat, *Euro indicators news release 145/2009*, October 2009

The events of the last year also caused a substantial reduction of CIS exports to Turkey: the Turkish industry minister announced in September that total gas consumption in 2009 is expected to be down by 5.4% year on year, and that purchases of Russian gas in the first half of the year were 25% less than in the same period of 2008.⁷

The most recent available information from Gazprom on its exports, in a bond prospectus, included preliminary estimates that sales under long-term contracts with European customers in the first half of 2009 were 60.4 Bcm, compared to 89.1 Bcm in the first half of 2008 – a year-on-year drop of 32.3%. The average prices for these sales were \$336/Mcm, compared to \$372/Mcm in the first half of 2009, implying that revenue from them dropped to \$20.29 billion from \$33.14 billion.⁸

The diversification by European customers away from FSU gas appears to have been a reaction, firstly, to the very high prices of gas bought under Gazprom's long-term contracts. These contracts are priced according to an oil-linked formula that reflects oil prices with a six- or nine-month delay, and consequently in the first half of 2009 these prices reached their peak, while prices of gas from other sources, along with energy prices in general, had been falling for several months. Consumers have reacted to this situation by buying gas from alternative sources and postponing purchases to the second half of the year when the prices of long-term Russian contract gas began to fall.

The sharp fall in Russia's share of European imports at the beginning of the year may also reflect the effect of the two-week supply interruption in January, caused by the dispute with Ukraine. There may also have been an adverse reaction to the dispute by customers, which may have increased the level of diversification away from Russian purchases in subsequent months.

A crucial question for the CIS gas sector in general, and Gazprom in particular, is whether, when, and to what degree, these export sales to Europe will be recovered. An important limitation on purchasers' options are the minimum take-or-pay levels in long-term export contracts. It is probable that the long term contract volumes are around 164 Bcm/year.⁹ While precise take-or-pay levels are not known, Aleksandr Medvedev, general director of Gazprom Export, said in June that he expected export sales of 142.1 Bcm for the year; this suggests the aggregate total of minimum take-or-pay volumes are probably near to this amount. But by September 2009, it became clear that Gazprom's

⁷ Natalia Grib, "'Gazprom' vozmet svoe ot Evropy", *Kommersant*, 28 September 2009.

⁸ Gazprom, *Programme for the Issuance of Loan Participation Notes*, July 2009, p. 6.

⁹ In 2008, the total volume exported by Gazprom under long-term contracts was reported as 163.3 Bcm (116.9 Bcm to western Europe, 41.9 Bcm to eastern Europe and 4.5 Bcm to the Baltic states).

largest customers in Germany, Turkey and Italy were asking that take-or-pay provisions be suspended, and proposing the renegotiation of price formulae.¹⁰ The important implications for Gazprom's relationship with its major European customers – and the likelihood of fundamental changes in the pricing regime – is further discussed in Section 3 below.

An uncertain future for exports

The importance of this turning-point for Russian gas exports to Europe can not be overstated. These exports have risen steadily from around 100 Bcm/year in the early 1990s to 155-170 Bcm/year in recent years. Whereas annual sales have previously never fallen by more than 10 Bcm between one year and the next, the year-on-year fall for the first half of 2009 (sales on long-term contracts only) was 28.7 Bcm. The especially sharp drop in Russian exports to Europe in the first half of 2009 may be expected to be reversed to some extent in the second half of 2009 and in 2010. But there are many uncertainties thereafter, concerning both total European demand and possible moves by European purchasers to import gas from alternative suppliers.

The uncertainties in total European demand for gas have been analysed by Anouk Honore of the OIES Natural Gas Research Programme, author of an exhaustive study to be published in 2010. First, she cautions that we do not know for the various demand sectors the relative weights of demand reduction (that will be restored as economies recover from the recession) and demand destruction. Second, she points out that long-term forecasts of European gas demand from agencies such as the IEA have been constantly revised downwards. The pre-crisis consensus that demand in European non-power sectors would grow by 0.8-1% per annum over the next 25 years is unsustainable in light of the crisis, she argues. Third, she points out that the uncertainties are greatest in the power sector, which has been the main engine of gas demand growth. The construction of gas-fired power plants could be far slower than expected. Honore does not expect any recovery to 2008 demand levels until 2015 at the earliest.¹¹

The second set of long-term uncertainties concerns competing sources of supply to the European market. First, the oversupply of LNG, arising from higher than expected domestic supply in the US (caused by the unconventional gas boom), the recession, and the expected increase in LNG output

¹⁰ Gazprom, "Press-konferentsiia na temu 'Eksport i povyshenie nadezhnosti postavok gaza v Evropu'", notes of press conference by Aleksandr Medvedev, 24 June 2009; Natalia Grib, "'Gazprom' vozmet svoe ot Evropy", *Kommersant*, 28 September 2009.

¹¹ Anouk Honore, *European Gas Demand, Supply & Pricing: Cycles, Seasons and the Impact of LNG Price Arbitrage* (Oxford, Oxford University Press, forthcoming).

from Qatar, raises the possibility of increased LNG imports to Europe.¹² The question is not whether such alternative sources of supply might displace Russian gas exports from their traditional markets, which is not a serious prospect at present. Nor will the mainly geographical factors that have made Russia the largest source of European gas imports, and given it a strong position in the European market, change. But for at least the next few years, the balance of the European market will be tilted fundamentally in favour of buyers, both by the demand consequences of the recession and by the availability of LNG. Second, the rapid growth of unconventional gas production in the US in the last year has raised the question of whether this could become a significant source of supply in Europe too – and this could be a significant factor by the 2020s.¹³

Whereas 18 months ago many were concerned at the prospect that Russian gas supply might struggle to match demand – in part because of the expectation that the steady increases in export sales would continue – this now seems to be the least of the CIS gas sector's problems. On the contrary, the prospect that demand growth in Europe may be slowed or reversed over a long period, and may be accompanied by the availability of gas from new suppliers, raises a new set of problems. It places a question-mark against the oil-linked pricing method in long-term contracts. (See Section 3 below.) Finally, it has profound consequences for investment, particularly in the sense that it casts doubt on the timing of, and need for, Russia's new, large – and expensive – production projects. It also raises the issue of whether investment might be refocused towards Asian markets. (See Section 5 below.)

2.2 *Russia and the CIS*

Natural gas demand in Russia and the CIS has fallen, more sharply than in Europe, in line with the impact of the recession on economic activity. In the first half of 2009, consumption fell in Russia and Ukraine, the two largest CIS consuming countries, by 6.2% and 28.7% respectively, year-on-year. Note that these data are *not* temperature-corrected. Moreover, beyond Russia and Ukraine, very little statistical information of any kind on demand is easily available, and it is therefore not yet possible to estimate the fall in demand across the CIS. For example there is no up-to-date information from Uzbekistan, the third largest consumer. (Given its relative isolation from world markets, the impact of the crisis there has probably been less severe.) Here I discuss demand trends in Russia and Ukraine, and some broader issues.

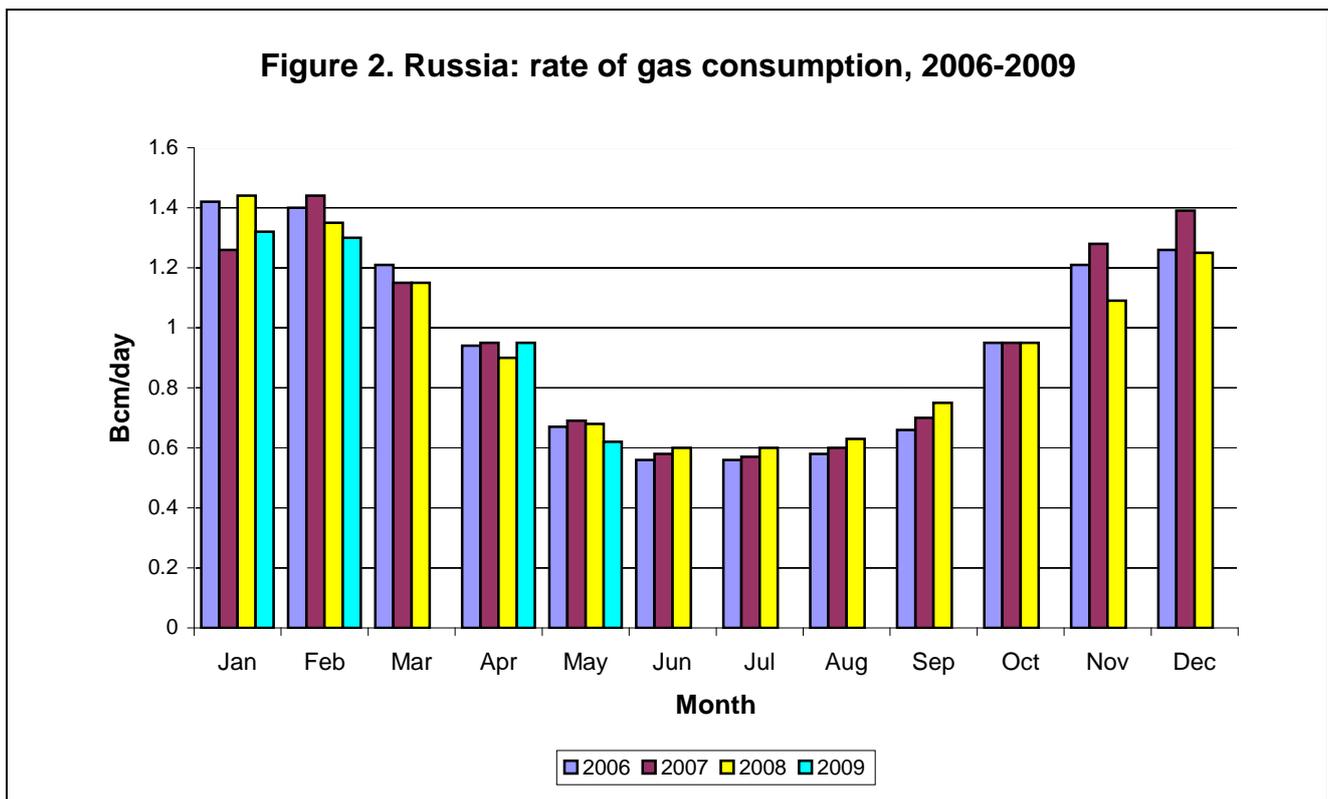
¹² Howard Rogers, *LNG trade-flows in the Atlantic Basin: trends and discontinuities* (OIES, forthcoming)

¹³ See Florence Gény, *Can Shale Gas be a Game-Changer for European Gas Markets?* (OIES, forthcoming). [I assume this is correct.]

Russia

Gazprom reported that the total amount of gas delivered by the unified gas supply system (UGSS) to customers in the first half of 2009 was 176.2 Bcm, compared to 187.8 Bcm in the same period of 2008, a decrease of 6.2%.¹⁴ Monthly data show that the sharpest falls took place in November and December of 2008. Demand reduction started to slow by February 2009, and in April, demand was slightly higher than in April 2008. The energy ministry has been reported as saying that the improvement continued up to June, when demand was 4% higher than in the same month of 2008.¹⁵ But there is not yet enough information to gauge whether the trend to lower demand has been halted or reversed. Statistics showing the daily rate of consumption are shown in Figure 2; the same information is shown in tabular form in the Appendix, Table 9.

Figure 2: Russia: rate of gas consumption, 2006-2009



Source: TsDU TEK/ Energy Research Institute of the Russian Academy of Sciences.
 Note: no information available for March 2009

¹⁴ Gazprom, *Programme for the Issuance of Loan Participation Notes*, July 2009, p. 6.

¹⁵ Tatiana Mitrova, *Analyses of the Future Russian Energy Policy and Gas Sector Development* (Energy Research Institute, Russian Academy of Sciences, May 2009); Natalia Grib, "Gazprom opiat' poterial dobychu", *Kommersant*, 3 July 2009.

A significant part of the fall in demand was in the power sector and heating plants, which together account for more than half of consumption – but the steepest declines were in the industrial sectors. Tatiana Mitrova of the Energy Research Institute at the Russian Academy of Sciences has written that, in the first quarter of 2009, consumption fell by more than 10% in the metallurgical sector as a whole and by 33% among pig iron producers; by more than 50% among cement producers; and by 7% among chemical fertiliser producers. Consumption in the residential sector in the first quarter was down only 4% year on year, and households and other non-industrial users recorded a 14% increase in consumption in March, due to cold weather. This extra consumption – in sectors that pay lower tariffs and are less responsive to tariff increases – to some extent counteracted the demand reductions caused by economic circumstances.¹⁶

Ukraine

The concentration of demand reduction among industrial consumers can be seen more clearly in Ukraine, firstly because industrial production, and gas demand from industry, has fallen even more steeply than in Russia, and secondly because fuller statistical information is available. The economic slump hit Ukraine more rapidly than many other countries, due to

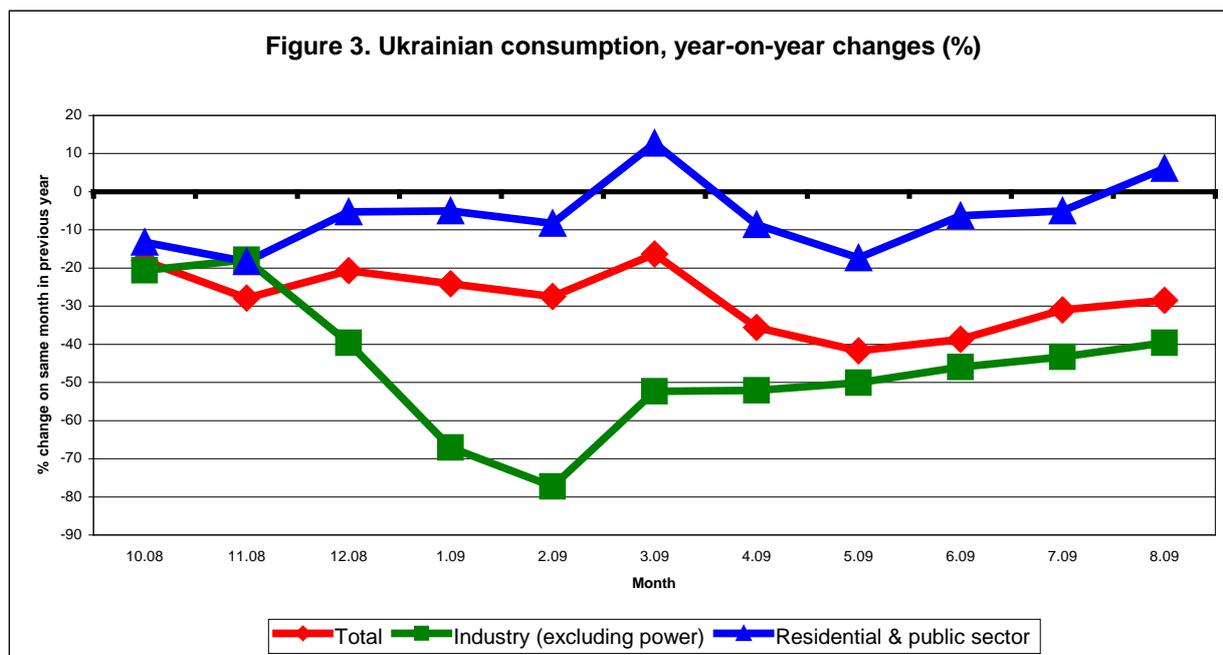
- (i) the disproportionate significance for its economy of steel and chemical fertiliser exports, which suffered from rapid price falls,
- (ii) the high level of integration of its banking sector into the international banking sector, the high levels of corporate debt taken on during 2006-08, and the especially severe character of the credit squeeze in Ukraine, and
- (iii) the coincidence of the economic recession with sharp increases in Russian gas import prices in January 2009, which meant that industrial consumers faced rising input prices and falling sales prices simultaneously.

Ukraine's economy began to contract rapidly in October 2008, directly after the financial crisis took hold in the US. Gas demand followed: gas balances compiled each month by the energy ministry show that total demand fell year-on-year by 18.1% in October 2008, 27.9% in November 2008 and 20.7% in December 2008. In the first half of 2009, the aggregate decline was 28.7% year-on-year. The decline has been much steeper in industry than in the residential and public sectors. Industrial consumption was down year-on-year by 20.6% in October 2008, 17.8% in November 2008 and 39.6% in December 2008. In January and February 2009 the year-on-year falls were 67.1% and

¹⁶ Mitrova, op. cit.

77.3% respectively, reflecting both the impact of the recession and the difficulties that Ukraine had in supplying some industrial customers during and after the gas dispute with Russia. Thereafter industrial demand moved slowly from about 45% of the level of the previous year to about 60%. The contrast between year-on-year changes in demand in the industrial and residential sectors is shown in Figure 3.

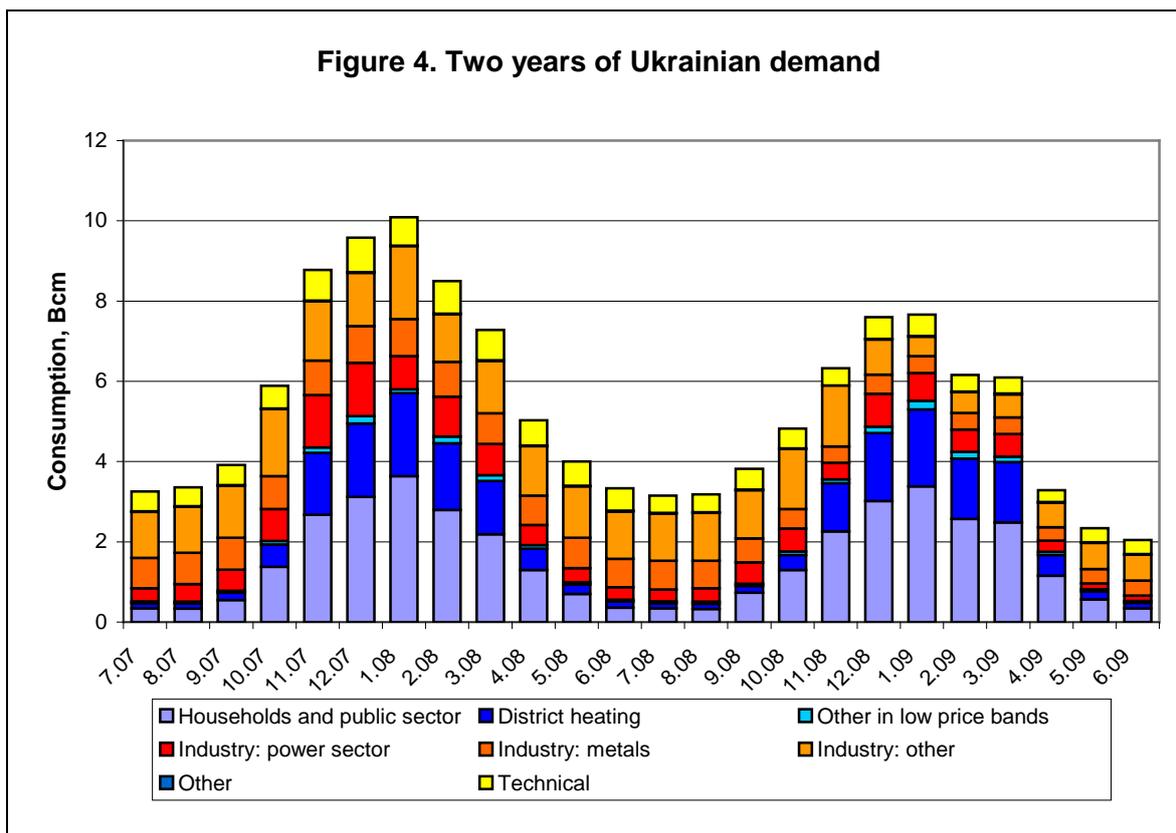
Figure 3: Ukrainian Consumption: year on year changes (%)



Source: energy ministry statistics / *Energobiznes*/ author's calculations

Figure 4 presents monthly demand levels over two years – July 2007 to June 2009. The striking difference between the two peaks shows how much demand fell during the winter of 2008-09. The Figure also shows the relatively stable demand from residential customers and district heating companies (blue-grey and blue bars respectively), and the volatile demand from the power and industrial sectors (red and orange bars respectively). (Full information on demand is presented in tabular form in the Appendix, Table 11.)

Figure 4: Two years of Ukrainian Demand



Source: energy ministry statistics / *EnergoBiznes*

Some longer-term issues on CIS demand

The economic crisis has added to the long-term uncertainties surrounding gas demand in the CIS. The resumption of economic growth, once the recession in the CIS countries ends, may be expected to revive demand. But there are two caveats. First, the consensus view among economists is that the recovery in eastern Europe and the CIS will be slower than elsewhere. Second, there are a range of factors – including the likelihood of economic restructuring and possible changes in the fuel mix, and progress towards more efficient consumption of energy – that may mean that some of the demand reductions of 2008-09 may never be restored and hence can be considered destroyed.

The expectation that recovery will be slower in the CIS than elsewhere is shared by most economists, independently of their view of the general pace of the world recovery. The IMF forecast, in economic projections published in July 2009, that, among the emerging and developing economies, the CIS would experience the deepest recession in 2009, and the most sluggish recovery except for eastern Europe’s in 2010. (The IMF’s forecasts are presented in the Appendix, Table 12.) The IMF attributed the projection of slower recovery in eastern Europe and the CIS to the

particularly strong impact of the financial crisis there, “with capital flows reversed and commodity exports sharply contracted”, but added that recoveries in commodity prices could raise demand in key CIS economies. Many CIS economies are seen as particularly vulnerable to the effects of this recession because of their openness, the importance of trade to GDP, the weakness of banking systems and the high levels of corporate debt accumulated during the boom.¹⁷ Some economists believe such factors will hinder recovery in a way that they will not in most Asian countries, for example. There is also disagreement on whether oil prices will remain as strong as the IMF forecasts imply. The more bearish among private sector economists suggest that Russia will register zero growth in 2010 and may face a “lost decade”.¹⁸

Whatever the timing of the recovery in the CIS countries, there are many reasons to expect that gas demand will not follow it in a linear fashion. The main uncertainties that surround future demand trends are:

1. *The effect of the recession on the changing character of industry, and on investment.* The post-Soviet period has been characterised by a shift in CIS economies away from traditional manufacturing industries and towards other types of economic activity. The recession, which has hit the traditional industries particularly hard, may be expected to force this process along. In Russia and Ukraine, the steep fall in industrial output in 2009 has caused widespread closures and lay-offs. Energy-intensive industries such as metallurgy, and chemical fertiliser and cement production, have been among those hit hardest. Where closures or reductions in output turn out to be permanent, and forms of economic activity change during the recovery, this will result in the permanent reduction of some part of gas demand.

A second, and possibly countervailing, factor is the impact of the recession on investment. Even during the boom years of 2001-08, the level of investment in Russia and other CIS economies was low in comparison to other similar economies. The recession, and the persisting credit squeeze, will further substantially reduce investment levels. One consequence of this is likely to be a negative impact on the level of capital stock replacement, long regarded as overdue in many post-Soviet industries. This in turn would probably postpone efficiency improvements, including energy-saving

¹⁷ IMF, *World Economic Outlook*, April 2009 and October 2009, and *World Economic Outlook Update*, 8 July 2009; EBRD, “Eastern European economies to contract 5 per cent in 2009”, press release, 7 May 2009; OECD, *Economic Survey: Russian Federation*, 2009.

¹⁸ For example, Neil Shearing of Capital Economics, the macroeconomics consultancy, recently argued that Russia would not recover its 2008 level of output until 2014.

measures. This would undermine competitiveness and have a generally damaging effect on the economy, although it would also hold up some part of gas demand in the medium term.

2. *The combination of economic recovery and the continuing convergence of CIS and European gas prices, with the resulting impact on patterns of energy consumption and investment.* It is reasonable to presume that the long-term trend towards convergence of CIS and European prices will continue during the economic recovery. Before the onset of the crisis, it had become clear that the increases in gas prices would have a significant impact on the timing and manner of investment decisions among industrial consumers, and on government decisions about the reform of municipal heating systems. The crisis has now introduced a further obstacle: the difficulty of raising investment capital. A key area in which these dilemmas will have to be resolved is the Russian power sector, which during the 2000s consumed 150-175 Bcm/year of gas, i.e. about twice Germany's total consumption. Tatiana Mitrova's consideration of this issue, published before the onset of the crisis, concluded that changes in gas prices would "dramatically reduce the competitiveness of gas-fired plants as the base load power generation source". Installing new gas-fired facilities would now be efficient only in some specific cases; with more expensive fuel inputs, the use of gas-fired power stations would change; "they will increasingly be used as flexible sources, i.e. for peak load rather than base load". As a result of the economic crisis, electricity demand growth forecasts have been sharply reduced. While the government had originally projected 43,000 MW of new capacity would be needed by 2012, by mid 2009 it was expected that only 12,000-15,000 MW of this would be built, with the rest being postponed to 2015-16 or dropped all together. For gas demand, changes in the pattern of these investment decisions will be crucial.¹⁹

In industry, some particularly energy-intensive sectors face the danger that the combination of sharp falls in demand for their own products, intense international competition and higher gas prices will make them unable to compete. An example is the Ukrainian chemical fertiliser industry, which was badly affected by the way that Ukrainian imported gas prices have risen more rapidly than Russian domestic prices. In early 2009 Ukrainian chemical fertiliser producers were buying gas at around \$247/Mcm, while their Russian competitors were paying around \$90-110/Mcm. As a result of lower import prices and energetic lobbying, the regulated price for Ukrainian producers was cut to \$205/Mcm in the third quarter of 2009. But the production of ammonia, the main intermediary

¹⁹ Mitrova, "Natural Gas in Transition", in Pirani, *Russian and CIS Gas Markets*, p. 43; "Russia Sticks to Power Price Reforms – And Gas-Fired Power", *World Gas Intelligence*, 17 June 2009, p. 7.

product for fertilisers, was simply uneconomic, and most of the Ukrainian plants concentrated on producing urea and buying ammonia from Russia for reprocessing.²⁰

3. *Demand management and energy saving.* It seems likely that the shortage of investment capital caused by the recession will severely impact prospects for demand management and energy saving measures in CIS countries. The vast potential in CIS countries for energy saving – which means in the first instance, gas saving – is well known.²¹ But the constraints placed on CIS governments by the crisis, and the pressures caused by dealing simultaneously with troubled banking systems, industrial crisis and social issues, may further delay the adoption of energy-saving strategies – in other words, further delay the use of methods that have by far the greatest potential for reducing gas demand.

3. MARKETS AND PRICES

3.1 *Export markets*

The recession, and the drop in oil prices that has accompanied it, have (i) put downward pressure on natural gas prices in the European market, and (ii) opened up the differential between the prices charged under long-term import contracts, and those charged for spot sales at the UK national balancing point (NBP) and other gas hubs.

In early 2009, the opening-up of this differential was a contributing cause – possibly, the main cause – of the move by purchasers away from Russian imports to gas from other sources, discussed above. The price formulae in Gazprom’s long-term export contracts link the price of gas to a basket of alternative fuels (which in turn quite closely follows crude oil prices), with a six- or nine-month lag. The unprecedented volatility of oil prices in the last two years, and the delay element in the price formulae, produced the anomaly in the first half of 2009 that the prices in the contracts were at record highs, reflecting the oil prices of six or nine months earlier, while the world economy was experiencing its most serious recession in sixty years. Meanwhile gas prices at the European hubs, which more directly reflect current gas supply and demand than those in the contracts, fell. By mid

²⁰ “Porazhenie v khimicheskoi voine”, *Ekspert* (Kiev), 27 July 2009; “NKRE ustanovila tsenu na gaz v razmere 1584 tys. grn”, ukroil.com.ua, 17 August 2009.

²¹ For example the World Bank in 2007 estimated that, in Russia, \$320 billion of investment in energy saving would result in a projected 45% reduction in energy use, including 240 Bcm/year of gas consumption The World Bank, *Energy Efficiency in Russia: Untapped Reserves* (Washington DC, 2007).

2009 some major European consumers had renegotiated contracts with Dutch and Norwegian suppliers to allow for a proportion of the volumes to be priced with reference to the level and movement of spot gas prices.

While it may logically be expected that there will be a move back towards greater purchases of Russian imports in the second half of 2009, as contract prices fall, the opening-up of this differential may have deeper and longer-term consequences for the Russian gas export business. The questions raised are whether the formulae are sustainable, and, in particular, whether either seller or buyers will have any motivation to sign new long-term contracts based on these formulae. A paper published recently by Jonathan Stern of the OIES Natural Gas Research Programme discusses this issue in detail and concludes that a move away from oil-linked prices is almost inevitable, and is likely to happen in the next two or three years.²²

There are two further points to consider:

(1) The total volume of gas taken under long-term contracts appears to be stabilising, rather than growing as had previously been expected. Gazprom, in its most recent available statement, says that it has “contracted a minimum amount of gas deliveries to Europe 160 Bcm for 2010 and 168 Bcm annually for the period from 2020 to 2025, excluding additional gas deliveries under the Nord Stream project and our European customers’ options for additional gas deliveries under existing export contracts”. These figures are substantially lower than previous projections by the ministry of energy, which envisaged 166 Bcm of contract sales to Europe in 2010, 189 Bcm of contract sales to Europe in 2015 and total sales (including contract and spot sales) of 220-225 Bcm from 2020.²³

(2) In recent years, Gazprom’s sales in Europe outside long term contracts have been growing, as shown in Table 1. A small part of this comprises the trading activity of Gazprom’s UK subsidiary Gazprom Marketing & Trading, and larger volumes are being sold on a short-term or spot basis by other Gazprom subsidiaries (see line of chart “Other non-contract sales”). It is understood that some part of these amounts reflects trading churn rather than additional sales. But in any case what is significant is that, to the extent that Gazprom participates in spot market activity, it faces the danger of itself contributing to the pressure mounting on the oil-linked price structures.

²² Jonathan Stern, *Continental European Long-Term Gas Contracts: is a transition away from oil product-linked pricing inevitable and imminent?* (OIES, September 2009).

²³ Gazprom, *Programme for the Issuance of Loan Participation Notes*, July 2009, p. 118; Ministry of Energy of the Russian Federation, *Gas Industry Development Strategy to 2030*.

Table 1. Gazprom natural gas sales in Europe (Bcm)

	<u>2006</u>	<u>2007</u>	<u>2008</u>
Western Europe	118.0	128.6	141.0
Eastern Europe	43.5	39.4	42.5
Baltic States	5.2	5.3	4.1
TOTAL (as in the original source)	166.7	173.8	188.5
Long term contracts	151.1	150.5	158.8
Gazprom Marketing & Trading sales	5.3	6.7	7.3
Other non-contract sales	10.3	16.6	22.4

Source: Annual Reports, various years; Aleksandr Medvedev, *Eksport i povyshenie nadezhnosti postavok gaz v Evropu* (slide presentation, June 2009); *Programme for the Issuance of Loan Participation Notes*, July 2009, p. 118

The conclusion is that the recession may prove to be a turning-point not only in gas demand, but also in market mechanisms and prices for the Russian gas export business. With the exception of the UK's NBP, European spot markets still have limited liquidity. But as they grow, and as LNG sales into Europe grow, this may give powerful support to the argument that long-term contract prices should be linked to gas market prices rather than oil prices. There are a series of convincing reasons to expect that new contracts based on oil-linked formulae are far less likely to be signed in future, and that current contracts may be renegotiated.

3.2 CIS markets

The dynamics of domestic gas markets in the CIS are determined not only by supply and demand factors, but also by price-setting mechanisms, i.e. (i) in the case of Ukraine and other importers, import prices agreed with Russia, and (ii) tariffs for gas consumers set by national regulators, which cover the vast majority of sales. Gazprom, and since 2006 the Russian government, have aimed to bring both sets of prices into line with European netback (i.e. the price paid for Russian gas at the European border, minus transport costs). The economic crisis impacts these dynamics in three ways.

First, the changes in the European market are both depressing European prices short term and creating uncertainty longer-term about the level of European prices to which netback prices would be linked. Second, the economic crisis has made the Russian, Ukrainian and some other CIS governments much more cautious about implementing tariff increases, because of the fears of social and political reaction. Third, the damaging impact of the crisis on Gazprom's revenues redoubled its determination to bring CIS import prices to European netback levels rapidly, which has been a key driver in the Russo-Ukrainian gas dispute (see Section 6 below).

Russia

Since the world financial crisis began to impact the Russian economy directly in October 2008, the domestic gas market has on one hand faced sharply reduced demand, which has put pressure on domestic take-or-pay contracts, and on the other produced a return of the problem of non-payment as a result of the deterioration of general business conditions.

At the height of the boom in 2007-08, Gazprom, in agreement with the government, had taken measures to raise revenues from domestic sales and to manage the supply squeeze that seemed imminent: (i) The volume of sales to the power sector at regulated prices was capped at 103 Bcm/year, with the rest of the power sector's requirement (60 Bcm in 2007) to be bought from non-Gazprom producers and/or at unregulated prices; (ii) it encouraged its power and industrial sector customers to sign five-year take-or-pay contracts. It also introduced an experimental limited market in gas sales at unregulated prices, on a gas exchange managed by its domestic sales division Mezhhregiongaz, which was earmarked to market 10-15 Bcm/year of gas (half from Gazprom, half from other producers). However, sales on the exchange totalled just over 7 Bcm in 2007 and 6 Bcm in 2008.

In the last quarter of 2008 and the first quarter of 2009, the impact of the recession on Russian industry, and the resulting oversupply of gas, put all these arrangements under pressure. Non-payment and late payment, which was widespread in the 1990s but was almost eradicated during the 2000s, reappeared. Gazprom's volume of gross accounts receivable for gas supplied to Russian customers rose to 71.368 billion rubles at the end of December 2008, 27% higher than at the end of 2007 and 49% higher than at the end of 2006. Gazprom responded in the early months of 2009 by renegotiating contracts and demanding pre-payment; in some cases, industrial customers who were able to do so switched to other suppliers. Gazprom came under pressure to take a flexible approach

to take-or-pay penalties: a proposal was floated by the economic development ministry, presumably with the encouragement of the industry lobby, to abolish the penalties.²⁴

Under these adverse market conditions, the Russian gas exchange has not operated at all in 2009. The exchange operated under experimental status until the end of 2008; a government decree required for it to go into full operation from the start of January 2009 was not forthcoming. The decree was delayed by a dispute between regulatory authorities, who want companies to have the right to resell excess volumes acquired under take-or-pay contracts, and the energy ministry, which opposes that. Furthermore, the harsh reality is that, were the exchange to reopen this year, the prices quoted would reflect the sharp reduction in demand; this may have been what energy minister Sergei Shmatko had in mind when he said the exchange had “lost its relevance”.²⁵

Adjustment of price reform

In the medium term, the most significant impact of the economic crisis has been that the Russian government, in attempting to deal with the impact of the recession on living standards, in July again revised its initial ambitious plans for bringing domestic gas prices into line with European netback. In November 2006, after discussion with the gas and power industries, the government had announced its intention of prices reaching European netback levels by 2011. The rapid increase of European gas prices in late 2007 and 2008 suggested that European netback would be far above the level originally envisaged and made it appear that the goal was unachievable. This led to discussions in government about extending the timetable for achieving netback to 2014-15, and revisions to the timetable were proposed.

By late 2008 it was clear that managing the price rises would be difficult, but for a completely different set of reasons. The fall of the oil price from its original highs certainly revived the possibility that in the mid 2010s European gas prices will be at a level at which netback parity might at least be attempted.²⁶ But Russia now faced a serious recession, combined with a slump in

²⁴ Gazprom, *Programme for the Issuance*, op. cit., p. 122; Mitrova, op. cit; Ekaterina Grishkovets, “Gazprom ostaviat bez garantii”, *Kommersant*, 7 April 2009; Olga Mordiusenko, “Gaz upal na bumage”, *Kommersant*, 4 May 2009.

²⁵ Elena Mazneva, “Zabyli pro birzhu”, *Vedomosti*, 16 December 2008; Aleksandr Gudkov, “Gazovaia birzha poteriala aktual’nost’”, *Kommersant*, 2 June 2009; Gazprom, “Postavki gaza na vnutrenii rynek”, stenogramme of press conference by Kirill Seleznev, 9 June 2009; “FAS ne soglasovala dokument o birzhevoi torgovle gazom”, RIA Novosti, 11 June 2009.

²⁶ It is worth recalling the situation before the oil price spike of 2007-08. The Russian federal tariff service first calculated a nominal netback price in September 2007, based on oil product prices in Europe between July 2006 and March 2007, i.e. a period when oil prices were around \$60/barrel and European gas prices around \$270/Mcm. The

oil prices, resulting in a sudden drop in living standards and a sharp growth in unemployment. In place of 6-7% growth per annum in 2003-08, the ministry of economic development currently forecasts an 8.5% contraction of the economy this year (2009), with growth of 1%, 2.6% and 3.8% in 2010, 2011 and 2012.²⁷ World Bank indices of living standards fell steeply: between December 2008 and May 2009 the average wage in US dollars fell from \$638/month to \$587.20/month, while unemployment rose from 7.8% to 9.9%.²⁸ Whereas in mid 2008, the prospect of a gas supply squeeze gave impetus to price rises that would help to trigger efficiency improvements in the power and industrial sectors, in mid 2009 these problems appeared less urgent than the social consequences of the recession.

On 15 July 2009 the government further revised the timetable for gas tariff increases, limiting increases for industry in 2010 to 15%. (At one point during preparatory discussions, it seemed that the increase would be as low as 5%.)²⁹ Table 2 shows the projected increases. The ruble's devaluation during the first half of 2009 is also a significant factor: indicative prices in dollars have been given, which show that (if an exchange rate of 32 rubles/\$ is assumed for this year) this year's average prices are lower than last year's in dollar terms. In October 2009, the energy ministry's most recent proposal on price reform stated that regulation would remain in place until at least 2012, and argued that it should be lifted only when non-discriminatory pipeline access is introduced (see also below, section 4 (c)).³⁰ Given the heated political debate around the schedule, further adjustments are possible.

netback price for the Moscow region was around \$173/Mcm, i.e. between two and three times current (2009) industrial tariffs.

²⁷ Ministerstvo ekonomicheskogo razvitiia RF, *Stsenarnye usloviia funktsionirovaniia ekonomiki RF*, Moscow July 2009, p. 8. The World Bank forecasts a 7.9% contraction this year and 2.5% growth this year. See World Bank, *Russian Economic Report*, June 2009, p. 12.

²⁸ World Bank, op cit., p. 29.

²⁹ "Tarify chut' pritormoziat", Interfax 15 July 2009; Liudmila Romanova, "Rost pritormozhen", *Vedomosti*, 14 July 2009.

³⁰ Elena Mazneva, "Tseny v obmen na trubu", *Vedomosti*, 20 October 2009.

Table 2. Actual and planned tariff increases in the Russian domestic market
Average prices in rubles/Mcm (indicative \$ prices in italics)

	Actual		7.09 proj.		
	2007	2008	2009	2010	2011
Industry – rubles/Mcm	1357	1636	1898	2183	2482
- \$/Mcm (indicative)	<i>53</i>	<i>66</i>	<i>59</i>	<i>68</i>	<i>78</i>
Households – rubles/Mcm	1032	1289	1495	1806	2183
- \$/Mcm (indicative)	<i>40</i>	<i>52</i>	<i>47</i>	<i>56</i>	<i>68</i>
			11.07 proj.		
			2009	2010	2011
Industry – rubles/Mcm			2166	2716	3872
- \$/Mcm (indicative)			<i>68</i>	<i>85</i>	<i>121</i>
Households – rubles/Mcm			1612	2015	2821
- \$/Mcm (indicative)			<i>50</i>	<i>63</i>	<i>88</i>

Note: Weighted mean average prices are given. There are wide variations in Russian domestic gas prices according to geographical location. \$ prices given at 25.6 rubles/\$ in 2007, 24.8 rubles/\$ in 2008, and 32 rubles/\$ for 2009-2011 projections. The conversion rates for 2007 and 2008, 25.6r/\$ and 24.8 r/\$ respectively, are the annual averages given in the EBRD's Economic Indicators.

Source: Stern, "The Russian Gas Balance to 2015"; Ministry of Economic Development scenarios, press reports

Ukraine and other net importers

The steady increase in world oil prices between 2003 and 2008 resulted in a steady increase in European gas prices. This formed the background for Gazprom's attempts to raise the sales prices of gas to CIS importer countries, from the relatively low levels established in the initial post-Soviet period towards European netback levels. The usually tightly-regulated domestic sales prices in those countries rose in turn. But despite Gazprom's best efforts, and the support it received from the Russian government, differentials remained between European netback levels and Ukrainian and Belarussian import prices. Noteworthy, too, are the differentials between consumer prices in these countries and those in Russia itself: Russia has been unwilling to impose on its own domestic market the reform timetable it has set for its neighbours. Table 3 summarises the available information on import prices and sales prices.

Table 3. Some comparative CIS gas prices

\$/Mcm	2003	2004	2005	2006	2007	2008	2009 estimates
Russia industry	24.7	31.7	35.5	40.74	53	65.9	59.3
Russia households	16.3	20.8	25.6	31.84	41.6	52	46.7
Belarus import prices	34.37	46.68	55.08	55.08	118	126.5	151
Belarus wholesale (Beltransgaz)	41.36	54.82	59.54	58.87	n/a	n/a	n/a
Belarus retail/households (Beltopgaz)	50.89	67	72.3	75.16	141.7	171.3	n/a
Ukraine import prices	n/a	n/a	77	95	130	179.5	236.11
Ukraine industry (state reg'd prices)	45.83	58.78	69.11	107.26	142.57	192.45	240.41
Ukraine households	n/a	30.5	30.5	67.16	87.51	79.32	87.14
Moldova import prices	80	80	80	135	170	236.25	n/a
European border price (Average German Import Price)	147.6	157.8	213.7	285.2	294.1	418.9	338

Note. These are indicative prices only. For Russia, average prices in geographical price band 3 (Moscow and some other large industrial areas) have been used. For Ukraine, 2006, 2008 and 2009 import prices are estimates. The Average German Import Price for 2009 is for the first six months of the year only. Annual average exchange rates from the EBRD summary of economic indicators are used. Source, Pirani (ed.), *Russian and CIS gas markets*, various chapters; Jonathan Stern; Howard Rogers; author's calculations.

In the second half of 2008 and the first half of 2009, Gazprom, faced with the drastic financial consequences of the economic crisis described above (falling demand, falling prices, etc), became even more determined to eradicate the differential between CIS import prices and European netback levels. This was one of the causes of the 2009 Russo-Ukrainian gas dispute, and the contracts signed at the end of it – under which Ukrainian imports are priced quarterly at 80% of the European netback level in 2009 and will be priced at 100% in 2010 – represented a commercial success for Gazprom in this respect.

In the case of Belarus, five-year contracts signed at the end of 2006 also provided for a transition to a European netback price, although how this is defined was not made public. The two sides announced that Belarus would pay 67% of European netback in 2008, 80% in 2009, 90% in 2010 and 100% in 2011. Under this principle, netback in Belarus would be at roughly the same level as in Ukraine (differences between transport costs for the two countries are not substantial) – except that Gazprom does not pay export duty on gas sales to Belarus (which has a customs union with Russia).

A European netback “base price” for Belarus would therefore presumably be 26.3% lower than the equivalent European netback “base price” for Ukraine.³¹

Table 4 compares the netback “base price” for Ukraine with a nominal equivalent for Belarus. It shows (a) that the “base price” used for Ukraine was in the first half of the year substantially higher than European border prices, and (b) that even if the Ukrainian “base price” is adjusted for Belarus to account for the absence of export duty, there is still a considerable differential in the range of \$38-\$54/Mcm (shown in the final line) between that and the nominal Belarussian netback “base price” that can be derived from actual Belarussian import prices. There are no obvious commercial factors that would explain this differential. It appears to be primarily the result of political processes, i.e. harsher terms have been set for Ukraine because of the wider, and widening, political distance between its leadership and Russia’s.

This is not to say that the overall strategy of bringing Belarussian import prices to European netback levels has changed. The table shows that Belarussian prices are clearly moving with reference to a European netback price, but they are doing so more slowly than Ukraine’s. Public statements suggest that Gazprom is attempting to adhere to the European netback principle in the face of opposition from Minsk: in October, Belarussian prime minister Sergei Sidorski said that “force majeure events” arising from the economic crisis required a renegotiation of the 2006 contract, to which Gazprom ceo Aleksei Miller responded that the company did not intend to renegotiate the price formula.³²

³¹ In calculating European netback prices for Russia, the federal tariff service uses a discount of 26.3% to reflect the overall effect of export tariffs.

³² “Belarus in talks with Gazprom about 2010 gas price”, *Belorusskie novosti*, 6 October 2009; “Gazprom set to increase gas price for Belarus as agreed”, *Belorusskie novosti*, 8 October 2009.

Table 4. CIS import prices in 2009

<u>\$/Mcm</u>	Q1 09	Q2 09	Q3 09	Q4 09 projected
<u>European border price</u>				
Average German import price	401	301	260 est.	253 est.
<u>Ukrainian prices</u>				
European netback “base price” used for Ukrainian contract	450	338.68	247.50	260.62
Ukrainian import price (20% discount)	360	270.95	198.00	208.50
<u>Belarussian price</u>				
Reported Belarussian import price	210.00	157.00	115.00	119.00
<u>Differential between base prices used for Belarus and Ukraine</u>				
European netback “base price” used for Ukrainian contract – 26.3%	331.65	249.60	182.40	192.07
Inferred Belarussian “base price” (real price + 25%, i.e. net of discount)	262.50	196.25	143.75	148.75
Differential	52.50	53.75	38.65	43.32

Source: announcements by ministers and companies, author’s calculations, Howard Rogers (OIES)

In both the short term and the long term, the big changes in the European gas market may be expected to have consequences for the CIS importers. In the short term, if Gazprom’s European customers attempt to renegotiate contracts after the slump in demand this year, as appears likely, this may assist Ukraine in its efforts to renegotiate contracts on both volume and price, as it has said it will try to do, and Belarus in its efforts to renegotiate on price. In the longer term, if the move away from oil-linked prices continues, and European spot markets expand at the expense of long-term contract sales, the whole principle of “European netback” for CIS importers would have to be rethought, to answer the question: *what would it be a netback from?* To the extent that European contracts move towards formulae reflecting natural gas spot market prices, CIS import contracts could move in the same direction. A possibility is that prices netted back from the NetConnect Germany (NCG formerly EGT) hub could be incorporated into price formulae.

During the last couple of years, with the link to oil prices remaining the basis of price formation in Europe and oil prices being extremely volatile, European netback for Russia’s CIS exports has proved an elusive goal. At the end of last year, the author with colleagues observed that European gas prices had in 2006-08 risen “to the point where their imposition could do economic damage,

both in the western CIS and in Russia”.³³ Early in 2009, when oil prices crashed to around \$40/barrel – levels that are reflected in the lower European gas prices in the second half of the year – achieving European netback again began to look realisable for the CIS’s economies. At present, with oil prices at \$60-80/barrel, and most analysts expecting them to remain at that level or a little higher for some time, the move to European netback appears possible but difficult. But the possibility of a change in European price formation methods places a new question mark over the process. For example spot market prices of \$4-5/MMbtu could produce “European netback” prices in the western CIS of \$130-\$170, lower than has been forecast on the basis of oil-linked prices. A combination of the two is another possible outcome.

As for gas tariffs, the importer country governments face similar dilemmas to Russia’s. Concern about social protest has made them wary of raising tariffs at a time of economic hardship. This wariness has been particularly marked in Ukraine, the population of which has been much more adversely affected by the world crisis than that of Belarus, due to the open character of the economy. Tariff increases scheduled for September and October 2009, and agreed with the IMF under its extensive loan programme for Ukraine, have not been implemented.³⁴ As Table 3 shows, while Ukrainian industrial consumer prices are above import prices and approaching European netback, many residential consumers are paying tariffs at a discount of nearly two-thirds to industry.

4. PRODUCTION, AND COMPETITION BETWEEN SUPPLIERS

4.1 The decline in production

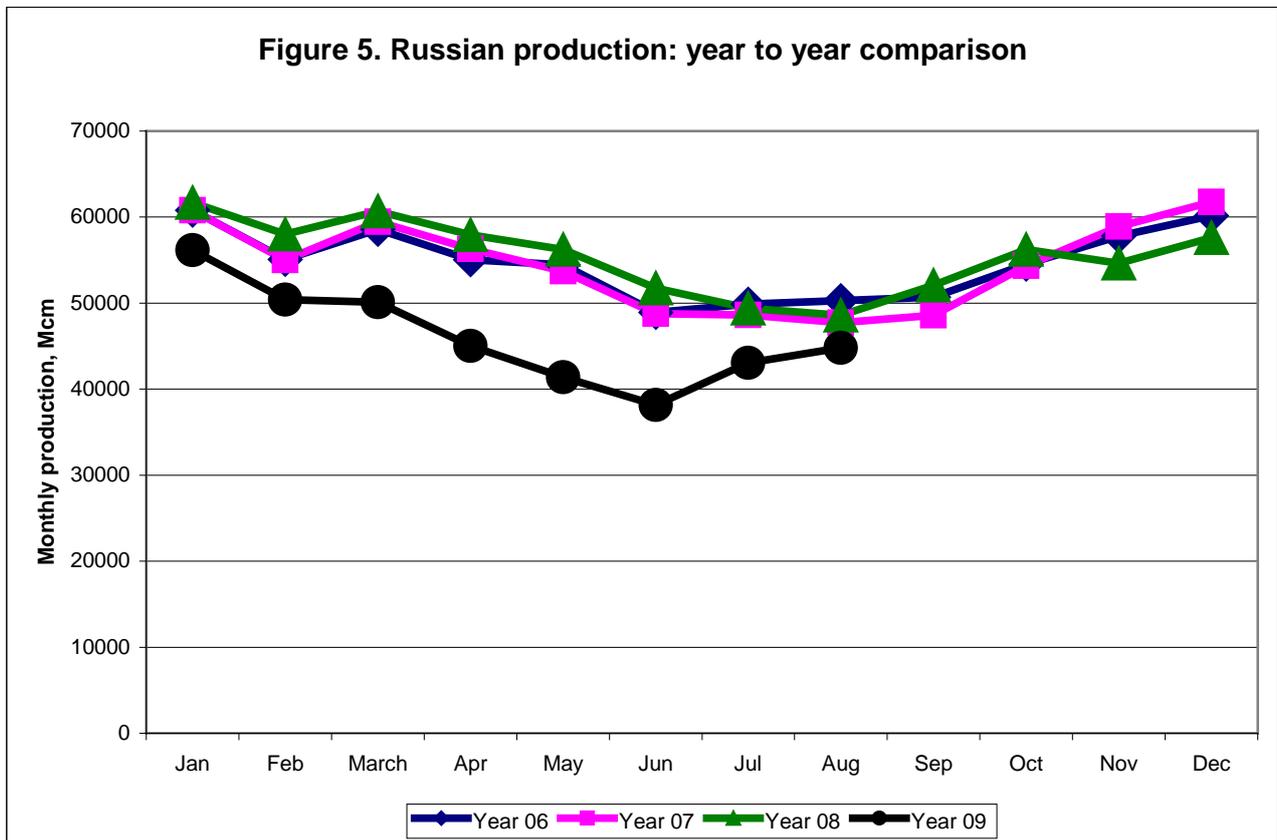
The reduction in demand in the CIS and Europe described in Section 2 above has led to the sharpest fall in gas production in post-Soviet times. In the first half of 2009, Russian gas production fell to 274.3 Bcm, i.e. 20.3% lower than in the first half of 2008. The most recent information on monthly output shows that, during the summer, signs in Russian industry of recovery from the recession were accompanied by an increase in gas production volumes, but that they remained well below the levels of 2006-08. Monthly production figures for 2009, compared to those in the three previous years, are shown in Figure 5. Although no production statistics are yet available from the CIS’s

³³ Tatiana Mitrova, Simon Pirani and Jonathan Stern, “Russia, the CIS and Europe: gas trade and transit”, in Pirani (ed.), *Russian and CIS Gas Markets and their Impact on Europe*, p. 437.

³⁴ Sergyi Liamets, “MVF bil’she Ukrainy nichogo ne dast”, *Ekonomichna Pravda*, 2 September 2009, and other press reports.

second-, third- and fourth-largest producers, Turkmenistan, Uzbekistan and Kazakhstan, it is clear that production in Turkmenistan, in particular, has fallen steeply. A useful indicator is Central Asian exports to Russia, which in the first quarter were 15.7 Bcm (up 13.8% from the first quarter of 2008), but in the second quarter, after an explosion closed the main pipeline carrying Turkmen gas to Russia, sank to 8.0 Bcm (down 52.7% from the second quarter of 2008). Turkmenistan, the main Central Asian exporter, delivered almost no gas to Russia in the third quarter, and at the time of writing there was little indication that this would change in the fourth quarter. The only other CIS producer of more than 20 Bcm/year is Ukraine. Production there has not been directly affected by the economic crisis, because any increases in domestic production displace more expensive imported gas. Therefore in spite of the collapse in domestic demand, production has risen very slightly, to 10.806 Bcm in the first half of 2009 from 9.880 Bcm in the first half of 2008.³⁵

Figure 5: Russian Production: year to year comparison



Source: InfoTEK/Energobiznes

Just as significant as the immediate cuts in production are the pessimistic forecasts being made about the pace at which production will recover, on account of the uncertainties surrounding demand over the long term, discussed above in Section 2. In June Aleksandr Ananekov,

³⁵ Elena Mazneva, "Neft' nuzhnee gaza", *Vedomosti*, 3 July 2009; Gazprom, *Programme for the Issuance*, p. 6 and p. 103 (for central Asian export figures); Ministry of fuel and energy of Ukraine, *Informatsiina dovidka*, 21 July 2009.

Gazprom's deputy chief executive for production, presented projections indicating that the company, having produced 549 Bcm of gas in 2007 and 549.7 Bcm in 2008, expected to produce 450-510 Bcm in 2009, 507 Bcm in 2010, 510 Bcm in 2011 and 523 bcm in 2012. Ananenko did not even give a date at which he believed Gazprom would return to the 2007-08 level of production. He emphasised that the company could produce up to 570-600 Bcm in 2010 if necessary, and that the constraints were on the demand side. (Others, including Aleksei Miller, Gazprom chief executive, have publicly given more bullish medium-term prognoses for production, but in the context of the demand situation described above, Ananenko's more detailed figures are probably the best starting point for analysis.)³⁶

The Russian ministry of economic development in September presented projections of total production that were slightly more optimistic than Gazprom's, and more optimistic than its own forecasts issued earlier in the year. The ministry envisages production falling from 663.6 Bcm in 2008 to 580 Bcm in 2009, and recovering to 623 Bcm in 2010, 630 Bcm in 2011 and 649 Bcm in 2012. Even by that date, though, the ministry does not foresee a return to 2007-08 production levels. Moreover, the two sets of figures, taken together, suggest only limited room for expansion for the oil companies and independent producers (see the Appendix, Table 10).³⁷

4.2 Competition between Russia and Central Asian suppliers

The market conditions this year – sharp reductions in production necessitated by falling demand across Europe and the CIS – are unprecedented for the post-Soviet gas industry. Competition between suppliers for market share has resulted. Given Gazprom's control of the unified gas transport system, on which not only Russian but also Central Asian producers heavily depend, this competition mainly takes the form of negotiations between Gazprom and other producers in which political and strategic considerations, as well as purely commercial ones, play a role. This process culminated in the second quarter of the year with the shutdown of gas exports to Russia from Turkmenistan, the CIS's second largest producer.

The context for the dispute is Russia's, and Gazprom's, long-standing determination to retain, as far as possible, control over Central Asian exports, and to limit attempts by Central Asian producers to

³⁶ Gazprom, "Razvitiie mineral'no-syr'evoi bazy. Dobycha gaza. Razvitie GTS", stenogramme of press conference by Aleksandr Ananenko, 16 June 2009; Mazneva, "Neft' nuzhnee gaza", *Vedomosti*, op. cit.

³⁷ Ministerstvo ekonomicheskogo razvitiia RF, *Stsenarnye usloviia funktsionirovaniia ekonomiki RF*, Moscow July 2009, p. 14; Elena Mazneva, "Gazovaia iama", *Vedomosti*, 9 July 2009.

open up export routes either to China and other Asian destinations or to Europe by routes that avoid Russia. The first real challenge to Russian dominance of Central Asian exports has been presented by China, with the gas export agreements signed between Turkmenistan and China in 2006, the beginning of construction of the Turkmen-Kazakh-Chinese pipeline in 2007, and the prospect that up to 30 Bcm/year could be exported to China through the pipeline from 2011. Against this background of alternative export prospects, the Central Asian producers put pressure on Russia in 2007-08 to pay “European”, i.e. netback, prices, for their gas. As far as is known, at the end of 2008 Gazprom entered into purchase agreements with the Turkmen, Kazakh and Uzbek national gas companies on that principle. Unconfirmed reports suggest that Russia agreed with Turkmenistan a fixed price for the whole of 2009, while agreeing with Kazakhstan and Uzbekistan that their sales prices would alter in line with European netback. In any case, no sooner had the agreements been made than they came under pressure from the sharp changes in the market conditions that no-one had foreseen.

Turkmenistan, by far the largest Central Asian exporter (of 40-55 bcm/year in recent years), sells to Gazprom under a 25-year contract that began in 2003, the price-setting formulae in which are not public. In January this year, Russian prime minister Vladimir Putin implied in a speech that Russia was buying Turkmen gas at \$340/Mcm – a price that, as European export prices have come down during this year, implies a growing loss for Gazprom. In the first quarter of the year, Central Asian exports to Russia actually increased year-on-year, as mentioned above. But, according to the Turkmen authorities, Gazprom on 8 April without warning reduced by 90% the volumes of imported gas it was accepting via the main Central Asia-Centre pipeline. On 9 April there was an explosion on the Davletbat-Dariyalyk section of the CAC-4 line in Turkmenistan, and exports were stopped completely. Production was cut drastically: Odek Odekov, director of Turkmengeologia, reported that 195 producing wells had been shut in. Although Gazprom did not at first comment publicly, it later became clear that the company was predicating a resumption of deliveries on renegotiation of volumes and prices.³⁸

On 29 May Odekov of Turkmengeologia said that the pipeline had been repaired and deliveries could be resumed, and that if negotiations on volumes and prices were not settled the Turkmen side might go to international arbitration. On 1 June Gazprom deputy chief executive Valery Golubev stated that the company was seeking a revision of volumes and/or prices; later in June Russian

³⁸ Natalia Grib, “Gazprom tianet truby k Uzbekistanu”, *Kommersant*, 26 January 2009; Aleksandr Tutushkin, “Vygodnaia avariia”, *Vedomosti*, 10 April 2009; “Turkmeniia ostanovila dobychu na 195 skvazhinakh”, *Vzgliad*, 29 May 2009.

deputy prime minister Igor Sechin confirmed that the dispute with Turkmenistan concerned prices. In September, suggestions were made in the Russian media that the two sides were close to reaching an agreement, but a Gazprom delegation visited Turkmenistan in mid-October and returned without the stalemate having been broken. If the dispute were to continue into the winter, it would have potentially disastrous consequences for the Turkmen economy, which relies on gas for more than 50% of export revenues.³⁹

Gazprom appears to be taking a tough line with respect to Turkmenistan, directly as a result of the drastic deterioration in market conditions. By the second quarter of the year it had reduced its own production considerably, and faced a collapse of its European export revenues, as discussed above. Its managers no doubt felt they simply could not afford to keep buying large volumes of Turkmen gas at a loss. Although there is no official information from the governments and companies, it appears that Gazprom's policy in Central Asia is being applied unevenly: according to press reports it has continued to purchase gas from Kazakhstan and Uzbekistan at "European"-linked prices. If, as suggested above, Russia and Turkmenistan did indeed agree a high fixed price for the whole of 2009, this would have become especially untenable as other prices fell during the year. Unconfirmed reports have stated that Uzbekistan's export prices are \$301-350/Mcm, and that Kazakhstan is paid on a European netback formula for about 7 Bcm/year in exports from Karachaganak, and on a Ukrainian netback formula (i.e. 80% of European netback) for 3 Bcm/year of exports from other fields.⁴⁰

The Russo-Turkmen "gas war" marks a turning-point from Turkmenistan's point of view. Throughout the 2000s, Turkmen governments have sought alternative export routes for gas, but have (a) considered seriously only such options as complied with its policy of taking no transit or marketing risk, and (b) in practice assumed that demand from Gazprom, which offtakes about 85% of Turkmen exports, would remain reliable. This approach has now been proved unsustainable. Turkmenistan has as a result, firstly, pressed ahead with opening up its export route to China. Secondly, in July Turkmenistan announced its intention to raise exports to Iran, initially from 8 Bcm/year to 14 Bcm/year; the Dovletabad-Khangeran pipeline that will transport the extra volumes

³⁹ "Gazprovod 'Turkmeniia' gotov k vozobnovleniiu podachi gaza", *Vzgliad*, 29 May 2009; Aleksandr Tutushkin, "Snizhaite tseny", *Vedomosti*, 2 June 2009; Isabel Gorst, "Gazprom escalates Turkmen gas price dispute", *Financial Times*, 2 June 2009; "Gazprom still undecided on Turkmen gas deliveries", *Upstream*, 26 June 2009; "Gazprom meets Turkmen leader, no word on gas flow", Reuters, 19 October 2009.

⁴⁰ "Focus on Uzbekistan", *European Gas Markets*, 17 February 2009; "Gazprom dal Kazakhstanu evropeiskuiu tsenu", *Kommersant*, 22 May 2009.

is to be opened in December this year. Thirdly, for the longer term, Turkmenistan continues to keep its diplomatic options open with regard to supplying the Nabucco pipeline to Europe.⁴¹

Azerbaijan, the other Caspian gas exporter – perhaps in the light of the Russo-Turkmen conflict – is also toughening its resolve to diversify export routes away from Russia, to which it is linked by existing infrastructure. Although Russia and Azerbaijan last year signed a wide-ranging memorandum allowing for Russia to buy most or all of Azeri exports in coming years, the corporate agreement signed between Gazprom and Socar, the Azeri state oil and gas company in June this year provided for only 0.5 bcm/year of exports, starting from January 2010, but with an option to increase the volumes.⁴²

4.3 Competition between Gazprom and other Russian producers

The competition between suppliers for market share is also reflected in Russia's own gas sector. In the first half of 2009, at the height of the economic crisis, Gazprom, which is both the largest producer and the transport system operator, decreased the volumes of gas accepted into the system from other producers, i.e. Novatek, Itera, some other smaller independent producers, and the vertically-integrated oil companies.

Gazprom announced in March that it would cut volumes accepted, that priority would be given to associated gas from oil producers, in order to minimise flaring, and that a heavier burden would fall on natural gas producers. Gazprom was accused by smaller gas producers of rationing acceptances of volumes unevenly: on one hand, Novatek increased output in January-February and then decreased it less sharply than others; on the other, Gazprom's purchases from Itera fell steeply – from the Beregovoe field, by 80%, and from the Purgaz joint venture (owned 49% by Itera and 51% by Gazprom), by 25%. In April and May, Itera and three oil companies (TNK-BP, Rosneft and Lukoil) announced that the volumes accepted had been reduced and purchase prices reduced.⁴³ Nevertheless, statistical information covering the first eight months of 2009 suggests (i) that among the oil companies, only Lukoil and Surgutneftegaz had reduced production year-on-year, in both cases by less than one percentage point, while Rosneft and TNK-BP achieved robust increases in

⁴¹ “Turkmenistan to launch new Iran gas link in December”, Reuters, 13 August 2009; “Turkmenistan to build Iran line”, *International Gas Report*, 17 August 2009; “Turkmenistan: an exporter in transition”, in Pirani, *Russian and CIS Gas Markets*, pp. 272-316.

⁴² Gazprom press release, 29 June 2009; Isabel Gorst, “Gazprom clinches Azeri deal”, *Financial Times*, 30 June 2009.

⁴³ Irina Malkova, “Truba zakryta”, *Vedomosti*, 4 March 2009; Natalia Grib, “Priblizhaiutsia ochen' tiazhelye vremena”, *Kommersant*, 9 April 2009; Olga Mordiusenko, “Gaz zabilisia v skvazhinakh”, *Kommersant*, 3 June 2009; Mitrova, *Analyses of the Future Russian Energy Policy*, op. cit.

production; (ii) that among independent gas producers, Novatek increased production while others cut theirs, and (iii) that Gazprom bore the brunt of production cuts. The month-by-month production figures are given in Table 5, and the year-on-year changes in production in Table 6.

Table 5. Russian gas production, by producer (MMcm)

<u>Production monthly</u>	9.08	10.08	11.08	12.08	1.09	2.09	3.09	4.09	5.09	6.09	7.09	8.09
Gazprom	42853	45895	44671	47759	45016	39874	38789	34517	30656	27931	32465	33797
Oil companies	4646	5092	4911	4877	5880	5217	5755	5523	5646	5365	5555	5618
Novatek	2559	2756	2592	2694	2881	2735	2648	2539	2645	2482	2626	2615
Others	1366	1705	1639	1386	1413	1533	1521	1076	1037	884	987	925
PSA operators	650	795	825	877	957	1040	1393	1372	1404	1492	1414	1837
Total	52074	56243	54638	57593	56147	50399	50106	45026	41387	38154	43046	44793

Source: InfoTEK/*Energobiznes*

**Table 6. Eight months' gas production, year on year changes
Million cubic metres (rounded to nearest million)**

Company	Jan-Aug 2008	Jan-Aug 2009	09 as % of 08
Lukoil	9642	9593	99.5%
Rosneft	8579	11373	132.6%
Gazprom neft	1366	2880	210.9%
Surgutneftegaz	9386	9299	99.1%
TNK-BP Holding	6345	8541	134.6%
Tatneft	511	558	109.3%
Bashneft	232	284	122.6%
Slavneft	587	845	144%
Russneft	871	1186	136%
Oil companies, total	37517	44560	118.8%
Gazprom	369733	283043	76.5%
Novatek	20210	21170	104.7%
Others	11482	9370	81.6%
PSA operators	5332	10909	204.6%
Total	444275	369052	83.1%

Source: InfoTEK/*Energobiznes*

Against the background of this sharpened competition, progress in government towards implementation of the principle of non-discriminatory pipeline access – which has been under

discussion for some years – appears to have slowed down. It is understood that prime minister Putin and others in government are in favour of moving ahead, but that Gazprom's management is not. A regulation has been agreed with the relevant federal bodies, but Gazprom has objected to it on the grounds that it needs to be coordinated with the government's plan for development of the gas industry to 2030, and specifically with the provisions for investment. The regulation is now under consideration by government, according to newspaper reports citing Igor Artemev, the head of the Federal Antimonopoly Service (FAS). Meanwhile a FAS ruling that Gazprom discriminatingly denied access to a trader is under challenge in court, and FAS has warned in June that it is preparing further actions against Gazprom. In October 2009 the energy ministry proposed to link the lifting of price regulation (which Gazprom favours) with the introduction of non-discriminatory pipeline access (to which Gazprom is anxious to attach conditions).⁴⁴

It seems probable that, under crisis conditions, introduction of a new legal framework will be further delayed, and that in practice volumes accepted – and therefore production levels – will continue to be fixed by negotiation between Gazprom and other producers. This may aggravate the already serious difficulties for companies trying to take upstream investment decisions.

5. INVESTMENT

The uncertainties of the long-term demand outlook have suddenly produced a completely new set of dilemmas about investment for CIS gas companies. Until a year ago, it was widely assumed that gas demand would continue to increase in both Europe and the CIS. This assumption underpinned most discussions of the timetables for Gazprom's major new production projects, Yamal and Shtokman, and for other lesser projects across the CIS. Much concern was expressed that a supply gap could open up, i.e., essentially, that Gazprom, as its main west Siberian fields went into natural decline, might not bring new fields on stream quickly enough both to make up for the decline in output and meet increased demand. The world financial and economic crisis has at a stroke (i) made the recovery of demand to 2008 levels, let alone an expansion of demand, uncertain right through the 2010s, and (ii) made conditions for raising long-term finance for investment much more difficult. In the medium term, i.e. at least until 2015, the danger of a supply squeeze has receded. The emphasis laid on this danger in the conclusion of our recent book on the CIS gas sector⁴⁵ has been proven by

⁴⁴ FAS press release, "Dostup k gazotransportnym sistemam", 2 June 2009; "Krizis vse spishet", *Vedomosti*, 23 March 2009; Elena Mazneva, "Tseny v obmen na trubu", *Vedomosti*, 20 October 2009.

⁴⁵ Pirani (ed.), *Russian and CIS Gas Markets*, pp. 446-447.

events not to be justified. In the foreground is the prospect that the competition between suppliers, described in Section 4, will intensify.

The difficulties of adjusting to the new conditions have been concentrated most obviously in the discussion in Russia of Gazprom's investment programme, which accounts for the lion's share of investment in both production and transport in the CIS gas sector. In December 2008, with the economic recession already taking hold and the problem of demand reduction apparent, Gazprom's management approved an investment plan that prioritised the most essential production and transport projects. For 2009, it was budgeted at 920 billion rubles (including capital expenditure and long-term financial investments), including about 700 billion rubles of capital expenditure. Of this, 210 billion rubles was earmarked for production and transport infrastructure for Yamal peninsula developments. Other investment priorities were identified as the Zapolyarnoe and Urengoi fields, the Shtokman project, the Nord Stream pipeline and pipelines linking the Yamal fields with the existing transport system. (See Appendix, Table 13.)⁴⁶

In April, Gazprom made a financial investment of about 130 billion rubles, purchasing from Eni of Italy a 20% stake in Gazprom Neft. This brought its projected investment programme for 2009 to about 1050 billion rubles. But as the scale of the recession, and its impact on demand, became clearer in the months that followed, senior Gazprom managers stated that the investment programme would be cut by up to 30%. The most significant revision to the programme was postponement for one year, from late 2011 to late 2012, of the start-up of the Bovanenkovo field, due to be the first producing field on the Yamal peninsula. In mid-July the government finally approved a version of the programme costing 775 billion rubles, i.e. 26% lower than 1050 billion rubles and 16% lower than projected in December. These reductions are in the same range as the average for the international oil and gas industry estimated by the IEA. The revised investment programme reportedly includes 474 billion rubles of capital expenditure, of which 147 billion (62 billion less than originally envisaged) will go on the Yamal development, according to newspaper reports. Gazprom deputy ceo Ananenko stated in July 2009 that he expected capital expenditure to rise from about 474 billion rubles in 2009 to about 645 billion rubles in 2010.⁴⁷

⁴⁶ Gazprom, "Finansovo-ekonomicheskaya politika OAO 'Gazprom'", slide presentation by Aleksei Kruglov, 25 June 2009; Elena Mazneva, "Nedostacha v Gazprom", *Vedomosti*, 2 March 2009; Kirill Martynov, "Investitsionny sindrom", *Kommersant*, 30 April 2009.

⁴⁷ Gazprom, "Razvitiye mineral'no-syr'evoi bazy. Dobycha gaza. Razvitiye GTS", stenogramme of press conference by Aleksandr Ananenko, 16 June 2009; Olga Mordiusenko, "Gazprom otsenil budushchie traty", *Kommersant*, 27 July 2009; Elena Mazneva, "Minus 26%", *Vedomosti*, 14 July 2009; Irina Malkova, "Gazprom tianet vremia", *Vedomosti*, 22 July 2009.

5.1 Investment in production

The postponement of the Bovanenkovo start-up highlights the dilemmas faced by the Russian government and Gazprom management. Effectively, they have made a judgement, based on demand trends, that – at a time when costs are high, but falling – the postponement by another year of the arrest of the decline in Gazprom's production is more easily affordable than the financial burden of pressing ahead as originally intended. Investment in other items among the priorities identified by Gazprom may also be delayed. For example, by July, Gazprom – which had previously insisted that Shtokman, its second big new field after Yamal would remain on a timetable delivering first pipeline gas in 2013 and first LNG in 2014 – noted in a prospectus for eurobond investors that this timeline may be revised in accordance with market conditions.⁴⁸ However, none of this alters the medium-term picture: the company's production capabilities are likely to outstrip demand (although of course that also depends on the way that the non-Gazprom producers' output, and Central Asian exports to Russia, change.) Jonathan Stern, director of the OIES Natural Gas Research Programme, has written an article on Gazprom's investment in production, based on his researches into the subject over many years,⁴⁹ and further comment here would be superfluous. Here I note that the scaling-back of investment in production, in response to projections of medium- and long-term falling demand, is a general phenomenon not limited to Gazprom.

In Russia, investment programmes are being scaled back, and investment decisions postponed, across the oil and gas sector. Capital expenditure by Novatek, which between 2007 and 2008 increased substantially, by 63.4%, fell sharply in the first quarter of 2009, when it was 40.5% down year-on-year. The scaling-back of investments on associated petroleum gas utilisation is also significant. Official statistical estimates show that the utilisation rate of associated gas in Russia is about 73%, with about 16 Bcm being flared in 2007, although other international organisations, including the World Bank, say that the amount flared is much higher. In 2007 the government directed that the utilisation rate should be raised to 85% in 2009 and 95% by 2011, and indicated that it expected priority access to the transport system to be given to the extra gas volumes produced. Following the onset of the economic crisis, it has been reported that the energy ministry, on account of the difficult investment conditions, has revised its target, giving oil companies until

⁴⁸ Gazprom, *Programme for the Issuance of Loan Participation Notes*, July 2009, p. 98.

⁴⁹ Jonathan Stern, *Future Gas Production in Russia: is the concern about lack of investment justified?* (OIES, October 2009).

2014 to reach the 95% utilisation rate. In gas market terms, this decision has the effect of reducing supply in the same way as do decisions to postpone new production.⁵⁰

The reluctance to invest at a time of uncertain demand outlook, and high prices, is also evident at the Karachaganak field in Kazakhstan. The operators, BG Group and Eni, have begun discussions with the Kazakh government about postponing the completion of Phase 3 of the project, which will increase gas production to 16 Bcm/year from 12 Bcm/year. They cited high costs and long payback periods. Phase 3 was originally scheduled for completion by 2012, and as a result of the postponement, less relatively cheap Kazakh gas will be available for export to Russia from that year.⁵¹

The dominant trend, to delay investments in projects dependent on European demand, contrasts with some investment decisions focused on Far Eastern markets, where the impact of the recession on demand has been far less severe than in Europe. Foremost among such decisions is the agreement made between China and Turkmenistan in June, under which China will invest \$3 billion in production at Turkmenistan's Osman/South Yolotan field.⁵² Gazprom also sees diversification to the Far East as one way to soften the blows it has suffered to its European sales business: this is reflected in its continuing commitment to developing LNG sales in the Far East, and is also a factor in its decision to invest relatively heavily in the Sakhalin-Khabarovsk-Vladivostok pipeline (see below).

5.2 *Transport infrastructure*

The recession's impact on transport infrastructure investment is similar to its impact on upstream investment. But in the case of the CIS's main cross-border business, the export of Russian and Central Asian gas to Europe, governments' strategic and political reactions to the Russo-Ukrainian "gas war" in January are a decisive factor. The dispute itself is discussed in the next section; here the response in terms of pipeline investment is noted.

Investment decisions on transport infrastructure for Russian exports to Europe are being shaped by the various responses in Europe to the Russo-Ukrainian dispute. The German and Italian

⁵⁰ Novatek, *Management's Discussion and Analysis of Financial Condition and Results of Operations* for the first quarter of 2009; Alexei Chesnokov, "Flaring Up: Companies Pay High Costs to be Green", *Oil & Gas Eurasia*, April 2009, pp. 28-33.

⁵¹ "Next Karachaganak phase in limbo", *World Gas Intelligence*, 5 November 2008.

⁵² "Ukraine, Russia, dodge one more bullet", *World Gas Intelligence*, 10 June 2009.

governments, along with the large energy companies that purchase Russian gas, have viewed the dispute largely as a manifestation of Ukrainian transit risk. They are thus combining continued interest in future non-Russian sources of supply with strong support for Nord Stream. Were the investment timetable based purely on supply and demand considerations, Nord Stream could have been considered for postponement, given the expectations of substantially lower demand described in Section 2 above. In fact, the project makes sense primarily as a means to diversify transit away from Ukraine and, to a lesser extent, Belarus. Nord Stream's sponsors – Gazprom, Wintershall, E.ON Ruhrgas and Gasunie, possibly to be joined by Gaz de France – plan a 27.5 Bcm/year first pipeline to bring Russian gas directly to Germany via the Baltic Sea starting in 2011, and a second pipeline of the same capacity in 2012. The German and Italian states' commitment to the project is evident in the financing package for the first phase: planned lending from commercial banks has been reduced as a result of the credit squeeze from €1.5 billion to €800 million, and out of €3.5 billion in financing, €2.6 billion will be covered by German export credits and untied loan guarantees, and an estimated €500 million or more by Italian export credits. The financing could not have gone ahead without this level of state support. At the time of writing, the project has just cleared two of its last significant regulatory hurdles – the completion by Sweden and Finland of environmental impact assessment procedures and clearance of the project by the relevant authorities – and Nord Stream representatives continue to insist that the second pipeline, like the first, will be built on time.⁵³

While, on one hand, German and Italian state support has proved essential in allowing Nord Stream to go ahead, on the other, the European Commission has formed an alliance of international financial institutions that, it is hoped, will finance improvements to the Ukrainian transport network. The political logic in the background is the view that Ukraine needs to be pulled into a western geopolitical orbit, and away from Russia. In July, the EC's negotiations with Ukraine resulted in an agreement under which the Ukrainian government pledged to implement wide-ranging reforms of the gas sector, and the World Bank, European Bank for Reconstruction and Development and European Investment Bank pledged to consider granting \$1.7 billion in loans, of which \$900 million would be used to upgrade the transport system. (A further \$300 million would be short-term working capital, effectively to pay for gas purchases this year, and \$500 million for gas sector reform.) The negotiations have been linked to those around the IMF's large lending programme to

⁵³ Guy Chazan, "A new route for natural gas to Europe", *Wall Street Journal Europe*, 6 November 2009; Simon Pirani, "Nord Stream leaves the crunch the winner", *Project Finance*, July/August 2009; Nord Stream press release, 23 August 2009.

the Ukrainian budget, and there is no certainty about whether and when all the loans will be forthcoming.⁵⁴

For the longer term, the most significant pipeline projects under discussion are South Stream, which could bring Russian gas to south-east and southern Europe via the Black Sea and avoiding Ukraine, and Nabucco, which could bring Middle East and Central Asian gas via Turkey to Europe. In the aftermath of the Russo-Ukrainian dispute, political agreements necessary for both these complex cross-border projects have continued to be signed. The logic for building South Stream would ultimately be similar to that for Nord Stream, i.e. transit diversification, and ultimately its construction would depend on the extent to which, after Nord Stream, such diversification continued to be a priority for Gazprom and its major European customers. The Nabucco project has gained support both from central and eastern European governments nervous about their dependence on Russian imports, and from European and US politicians who regard diversification away from Russian gas as a political imperative. But, although Turkmenistan has displayed more interest in the project following its “gas war” with Russia, neither it nor Azerbaijan has committed gas volumes to the project. It is therefore unlikely to take shape before 2015, or transport substantial volumes much before 2020.

Beyond these international projects, and the Turkmen-China pipeline discussed above, the only significant investments in transport infrastructure are those by Gazprom. These investments, assuming the investment cuts are shared more or less equally with production, processing, and other expenditure, will be in the range of \$6.5-7.0 billion this year. Of the transport investments in Gazprom’s original investment plan (see Appendix, Table 13), more than 40% were related to Yamal and 20% related to Nord Stream. A notable, counter-cyclical expenditure item, and one which Gazprom has indicated may be increased rather than cut back, is the 11.5 billion rubles earmarked for the Sakhalin-Khabarovsk-Vladivostok pipeline in the Russian far east – for which no gas supply is yet committed. This pipeline, due to be completed by 2011, will support the economic development in general, and gasification in particular, of the Russian far east; this is a political priority for the Russian government, and Gazprom emphasises that the project forms part of the government’s development plan for the region. The second, less immediate, factor in the background is Gazprom’s general strategic intention of diversifying to Far Eastern markets, and into LNG, to compensate for the changes in the European market: this is relevant because the Sakhalin-Khabarovsk-Vladivostok pipeline could eventually link the Sakhalin projects either to China by

⁵⁴ European Commission press release, 31 July 2009.

pipeline, or to a future LNG plant at Vladivostok.⁵⁵ But such possibilities could materialise only some way into the future: such transport routes would have to be supplied either from the Sakhalin 1 project, the sales strategy for which is a matter of dispute between Gazprom and the operator, ExxonMobil, or from the Sakhalin 3 project, which has yet to be developed.

6. THE RUSSO-UKRAINIAN “GAS WAR”

In the wealth of commentary about the dispute between Russia and Ukraine over gas imports and transit, and the two-week interruption of supplies to Europe in January that resulted from it, surprisingly little has been said about the importance of the economic crisis as a causal factor. In this section I will argue that the economic crisis was probably the most important cause of the dispute, and comment on the possible course of the dispute in future.

What drove the sides into the dispute in the first place? In an assessment of the supply interruption in January, the author, together with colleagues, argued that the Ukrainian position was “characterised by desperation, engendered by Ukraine’s serious economic crisis, that rising gas prices will aggravate” and by “divisions in the political leadership that were prioritised over any larger strategic aims”.⁵⁶ That explanation retains its validity. The economic crisis impacted Ukraine above all through its weak banking system and corporate indebtedness, and a rapid deterioration of the terms of trade as its export industries (principally steel) contracted sharply while simultaneously its energy imports (in the first place gas) rose in price. The rising cost of Ukraine’s energy imports, while energy costs internationally were falling, was a result of the long-postponed efforts to close the differential between CIS gas prices and European gas prices discussed above. The slump in Ukrainian industrial demand for gas, alongside almost unchanged demand and build-up of late payment in the residential and district heating sectors, exacerbated the financial crisis of Naftogaz Ukrainy, the national oil and gas company, which was one of the immediate commercial triggers of the dispute.

In the same article, we argued that the Russian political leadership took “unnecessarily risky and commercially irrational action” at the height of the dispute, leading it to escalate the crisis and cause financial and reputational damage to Gazprom. We argued that, to the extent that Russian political motivation was at work, it was directed not against Europe, but against Ukraine. The political

⁵⁵ Viktor Tarnavskii, “Vostochnyi vektor”, *Energobiznes*, 2 June 2009; “Pustaia truba”, Lenta.ru, 1 August 2009.

⁵⁶ Pirani, Stern and Yafimava, *The Russo-Ukrainian gas dispute of January 2009: a comprehensive assessment*, p. 62.

hostility between Moscow and Kiev has increased since the January supply interruption – specifically, in Russia’s decision to appoint a new ambassador to Ukraine but to retain him in Moscow, and the exchange of recriminations between the countries’ presidents that followed. This political hostility is exacerbated by economic factors. While Russia has, like Ukraine, been hit hard by the crisis, its status as a major energy exporter – one that had accumulated substantial foreign exchange reserves during the oil boom, a large portion of which were employed after the crisis to stabilise the banking system and ensure a gradual, rather than sudden, devaluation – put it in a far stronger position. Nevertheless, at the end of 2008 its government was abruptly facing, for the first time in a decade, the prospects of spending, rather than collecting, foreign exchange reserves; of a budget deficit; and of industrial recession and its social consequences. The gigantic reduction in Gazprom’s export revenues, second only to those suffered by the oil sector, was naturally at the centre of political thinking. Taking a tough line with Ukraine was therefore not only politically attractive (as it had been for some time, in response to the pro-NATO stance of president Yushchenko in particular) but also commercially justified (in that the long-standing discounts and debts for Ukraine’s gas imports were less affordable than ever).

The aftermath of the January crisis

The January supply interruption ended with an agreement between Russia and Ukraine under which Gazprom and Naftogaz Ukrainy signed 11-year supply and transit contracts. These provided for Ukrainian import prices to be set at a European netback level, with a 20% discount in 2009 and no discount from 2010, and for transit fees to move by 2011 to a formula linked to fees charged in Europe. However some underlying problems, and problems with the agreement itself, remained.

First, the collapse in Ukrainian industrial demand meant that Ukraine has been unable to import anything like the minimum volumes of gas required under either (i) the take-or-pay clauses in the import contract, or (ii) the additional clause (6.5) that levies onerous penalties (300% of the value of non-delivered volumes in summer, 150% in winter) for reducing offtake by 6% or more of the agreed monthly amounts. Whereas the annual contract quantity is 40 Bcm for 2009 and 52 Bcm each year from 2010, with an 80% take-or-pay commitment (i.e. 32 Bcm for 2009 and 41.6 Bcm/year subsequently), Ukraine is only expected to import about 25 Bcm of gas in 2009, and has asked Russia to renegotiate the contract to reduce imports in 2010 to 35 Bcm.⁵⁷ It is hard to

⁵⁷ Ekaterina Kravchenko, “Beri men’she”, *Vedomosti*, 18 August 2009; “Ukraine dostatochno 24-25 mlrd kub m gaza”, UNIAN, 19 August 2009; “Ukraina v 2010 godu zakupit 25 mlrd”, UNIAN, 21 August 2009; Ekaterina Derbilova, “Gazprom obeshchaet ne perekryvat’ gaz Ukraine”, *Vedomosti*, 7 October 2009; other press reports.

understand why the Ukrainian prime minister and her negotiating team, who must in January have been aware of the scale of the country's industrial collapse, agreed to include in the contract either such high contract quantities or such unusually harsh penalties for failing to offtake monthly agreed volumes. The result is that by the middle of the year Ukraine was potentially liable to pay about \$5 billion worth of penalties. The Yalta agreement of 19 November between the Russian and Ukrainian prime ministers provided for these penalties to be waived, and a formal agreement was signed by Gazprom and Naftogaz a few days later. That agreement also reduced Naftogaz' annual contract quantity of imports for 2010 from 42 to 33.75 Bcm. This reduced the likelihood of a dispute in winter 2009/10 but did not resolve the longer term problem.

In the summer of 2009, Gazprom and others expressed concern that the low level of Ukrainian import purchases might result in the volumes being injected into storage being insufficient (i) to meet winter demand and/or (ii) to ensure smooth transit of Russian gas to Europe (under the long-standing arrangement whereby some of the physical volumes that enter Ukraine from the east are used to supply Ukrainian customers, while volumes in storage facilities, most of which are in western Ukraine, effectively replace this gas and are pumped in a western direction towards European destinations). There are no publicly available verifiable statistics on volumes in storage, but Naftogaz has stated repeatedly that there are sufficient volumes in storage (most recently, on 5 October, i.e. at the start of the winter, that 26.3 Bcm is in storage, i.e. 9.6% less than at the same time in 2008). The author, having cross-checked these with other public statements made over the last two years about storage levels, and energy ministry statistics of volumes injected into and withdrawn from storage, discerns a picture indicating that sufficient gas was injected into storage.⁵⁸

A second problem with the January agreements is that the Ukrainian negotiating team appears to have accepted a price formula with a European netback "base price" at too high a level. As Table 4 above shows, the "base price" set at \$450/Mcm for the first quarter, was considerably higher than European border prices. Moreover, the "base price" used for Belarus, even accounting for the fact that no export duty is paid on exports to Belarus, is at a discount of \$35-55 of the "base price" used for Ukraine, of which no more than \$5-10 can be attributed to differences in transport costs.

The inclusion of penalties, unusual in gas contracts, and other inconsistencies in terms and prices, suggest that the contracts signed in January are likely to need to be renegotiated. One explanation

⁵⁸ For public discussion, see Naftogaz Ukrainy, "Raz'iasnenie dlia SMI", 1 July 2009; "Energetic blackmail", *The Economist*, 4 July 2009; Interfax, "Avgust: gazovaia voina", 16 July 2009; "PKhG – plokho? Khorosho? Grustno!", *Energobiznes*, 23 June 2009; other press reports. For level of gas in storage, see "Ukraina v 2009 g. sokratila gaza v PKhG na 9.6%", www.ukroil.com.ua, 5 October 2009; energy ministry statistics.

for these deficiencies is that the contracts were negotiated under extreme pressure, in a few days, in contrast to the months or years usually required to prepare long-term gas sales and transit contracts. The contracts include provision for renegotiation if substantial changes in the market warrant it, and there appears to be a case for this to be invoked. But not for the first time in the Russo-Ukrainian relationship, politics will play a part. In particular, in Ukraine, the contract terms have been criticised publicly during the year by president Yushchenko in the context of his long-running and wider dispute with prime minister Timoshenko, who he accuses of negotiating a poor deal for Ukraine. Most recently, the president and his staff have criticised the price terms and penalties mentioned, and also called for transit fees to be renegotiated and “ship or pay” provisions to be added to the transit contract.⁵⁹

A third issue left unresolved by the January “gas war” – and the one that for some months afterwards seemed most likely to trigger a new dispute – is the poor financial condition of Naftogaz Ukrainy, the sole importer of gas into Ukraine and signatory to the contracts. There were fears that Naftogaz would simply be unable to make payments for gas imports on time, thus triggering an immediate supply interruption. During the course of the year it has become clear that such a scenario is unlikely to materialise, since the government and national bank are effectively guaranteeing both Naftogaz and its payments, and the IMF, through its extensive loan programme to Ukraine, is effectively guaranteeing the government. The government’s effective guarantee of Naftogaz took the form of cash being injected into the company either from the national bank via state-owned banks, or from Ukraine’s foreign exchange reserves, or from the state budget, to make payments for gas deliveries in April, May, June, July and presumably in August and September (no details of the mechanics of those payments were available at the time of writing).⁶⁰ The IMF’s effective guarantee of the government took the form of an understanding that its \$16.4 billion loan programme for Ukraine, launched in October last year – one of the Fund’s largest ever proportional to the size of a country’s economy – would be continued, notwithstanding the use of state funds for crisis-management of Naftogaz. Specifically, the Second Review of the programme, completed in July 2009, explicitly recognised Naftogaz’s operational deficit for the year, which the Fund

⁵⁹ Oleg Gavrish, “Iuliia Timoshenko vypisali platezhnoe poruchenie”, *Kommersant-Ukrainy*, 3 November 2009.

⁶⁰ On payment procedures, Olga Mordiusenko et al, “Gazprom nastigla rasplata”, *Kommersant*, 8 April 2009; “Iushchenko khochet zapretit’ raschety za gaz”, www.ukroil.com.ua, 15 May 2009; “Ukraine paid 32% of April imports cash”, *Platts European Gas Daily*, 14 May 2009; “Ukraina dolzhna Rossii \$500mln za postavki gaza v mae”, *Kommersant On Line*, 3 June; “Naftogaz rasschitalsia s Gazpromom”, *Ukrainska Pravda*, 7 July 2009; Ukrainian Presidential web site, various dates.

estimates at 2.7% of GDP (i.e. 25 billion hryvna, or nearly \$3 billion), as part of Ukraine's fiscal deficit.⁶¹

The IMF's approach in Ukraine needs to be set in the context of its strategy to deal with the consequences of the financial crisis. First, it agreed to provide loans to emerging market nations whose financial systems were affected by the crisis without the strict conditionality characteristic of its lending during the crises of the 1980s and 1990s. Under the Standby Arrangements negotiated in late 2008, in the immediate aftermath of the financial crisis, borrower governments were required to set out policy responses and fiscal targets in memoranda, and these are monitored by the IMF, but conditionality as such was set aside for broadly political reasons. The IMF rapidly made available a series of particularly large loan programmes for central and eastern Europe, where the level of cross-border debt was especially high and the danger of sovereign defaults and banking collapses was considered particularly acute. The IMF's approach prioritised avoiding such defaults and crises at all costs. Ukraine has been the biggest beneficiary of this approach. In essence, the effect on the gas dispute with Russia has been to convert Naftogaz's operational deficit into a Ukrainian state obligation to the IMF. It could be that the western countries that are the IMF's largest shareholders have encouraged such an approach, as part of their geopolitical strategy of attempting to deprive Russia of levers of control over its neighbours.

Future outcomes

The sharpening of the Russo-Ukrainian dispute with the January supply stoppage produced two main reactions in Europe. First, the German government, together with Gazprom's largest customers in Germany and France, pressed ahead with renewed determination to finance, and overcome regulatory obstacles to, the Nord Stream pipeline. Second, the central and south-eastern European countries that were most seriously impacted by the crisis have pressed ahead with short-term measures such as improving reversibility of pipeline connections (e.g. Czech Republic-Slovakia), refurbishing storage (in Czech Republic, Serbia, etc), and accelerated medium-term ones such as the construction of interconnectors (e.g. Bulgaria-Greece, Hungary-Romania), aimed at more effectively mitigating the impact of any future supply interruption.⁶²

⁶¹ IMF, *Ukraine: Second Review Under the Stand-By Arrangement*, September 2009. The Review forecast a fiscal deficit of 6% of GDP (state budget) plus 2.7% of GDP (Naftogaz).

⁶² See e.g. papers from the Energy Community conference in September 2009 on these issues, <http://www.energy-community.org/portal/page/portal/ENC_HOME/INST_AND_MEETINGS/Gas_Forum/2009/10_Sep>.

A further “gas war” over the winter of 2009-10, including supply interruptions, seems much less likely after the 19 November Yalta agreement. The IMF’s support for Ukraine’s state finances – notwithstanding disputes between the Fund and the government in September and October, arising from the government’s abandonment of its fiscal targets, the Fund’s criticism of budget spending and the prospect that loan tranches could be delayed – means that a Ukrainian failure to make payments for gas imports is possible but improbable. Reopened contract negotiations, and disputes arising from these, seem a more likely trigger for a new conflict. Political factors that were among the causes of the January 2009 dispute remain present: Russia’s disinclination to compromise, especially with president Yushchenko, and the splits in Ukrainian government, inevitably exacerbated in the run-up to the presidential election (with first round voting on 17 January).

Beyond this, the next significant turning-point in the Russo-Ukrainian “gas war” will probably be the completion of the first string of the Nord Stream pipeline, which is likely in 2011 or 2012. Until then, Ukraine will remain the near-monopoly transit route for Russian exports to Europe and, assuming Ukraine continues to struggle to pay for its imports, it will continue to be able to respond to threats of non-delivery in cases of non-payment with threats to offtake volumes of gas bound for Europe. Most Russian exports to Europe will continue to transit Ukraine, even if both Nord Stream pipelines are completed. But the impact on European customers of a supply interruption on Russo-Ukrainian routes will be significantly reduced once even one phase of Nord Stream is built – especially given the other mitigation measures being taken. This will weaken Ukraine’s bargaining position significantly.

In the long term, the potential for an intensification of the Russo-Ukrainian dispute may be reduced by changes that reduce the financial burden on Ukraine of imported gas. Any permanent reduction in its import requirement achieved by improved efficiency in the residential and district heating sector – rather than by the shut-down of industrial capacity – would make a contribution. So would any changes in the European pricing patterns for gas that reduced the level of European netback.

In any case, it seems that the present form of the Russo-Ukrainian conflict will end with the completion of the first phase of the Nord Stream project.

7. CONCLUSIONS

Gas demand in Europe may not recover its 2007-08 level before 2012, and perhaps later, and demand in the CIS will probably recover even more slowly, i.e. only by 2015, and perhaps later. As and when the recession gives way to economic growth, there is uncertainty about which parts of demand reduction will turn into demand destruction.

In Europe, changing market conditions – including the growth of sales of LNG and possibly, post-2020, unconventional gas – may impact the Russian export business. As economic recovery gets underway, it seems very likely that volumes sold under long-term contracts will be purchased as those contracts envisage – although pricing formulae may be altered in the manner discussed. But there must be considerable doubt about whether there will be demand for additional volumes of Russian gas. Exports to the CIS are also likely to be at a lower level: a key factor will be significant changes in the character of the economy (i.e. the continued shift away from traditional energy-intensive industries) during its recovery.

There are big consequences for gas pricing. In Europe, the current gaping differential between oil-linked long-term contract prices and spot prices is a reminder that the recession is providing the impetus for a move away from oil-linked pricing structures. The slump in demand increases consumers' room for manoeuvre and heightens the possibility that other pricing formulae will be sought for future contracts.

In the CIS, the timetable for moving to European netback prices has become more uncertain. During the early 2010s, European price levels may be lower than previously expected, especially if the link with oil is broken, meaning that the gap to be closed is smaller. But governments facing the social and political consequences of the recession do not like raising regulated prices, and are postponing and minimising increases.

In respect of *production*, and competition between producers, the demand slump has resulted in drastic production cuts in Russia and Central Asia. But it has “solved” one problem: in the period up to 2015, fears of a supply squeeze – as the west Siberian fields decline, prior to Yamal coming on stream – have diminished. Instead, this year has been characterised by sharp competition between producers. Turkmen exports to Russia have been cut since April and Turkmenistan is stepping up efforts to diversify its exports, initially to China and Iran. Harsh decisions have had to be made about who bears the burden of production cuts in Russia. Essentially these are made by

Gazprom, with whom independent producers have to negotiate. Efforts to push forward with market reform, third-party access to pipelines, etc, have been set back.

The economic crisis has had a serious effect on *investment*. The Yamal project, the largest gas industry investment in the CIS, has been postponed by a year. All other production projects can be, and mostly are being, postponed for longer. Indeed the real question is: what are the reasons for producers to commit to long-term, expensive projects? The exception to the trend is with investments directed towards the Asian market, for example the \$3 billion Chinese commitment to the Yolotan field in Turkmenistan.

Investment in transport infrastructure is subject to the same constraints. But after the Russo-Ukraine dispute, political and strategic (i.e. transit and supply diversification) drivers have come to the fore. So Nord Stream, which could in strict market terms be postponed, is going ahead thanks largely to strong German government support. The EU, on the other hand, has reacted to the dispute by trying to put together a loan package for Ukraine to upgrade parts of its transport system.

The *Russo-Ukraine dispute*, and specifically the supply interruption in January, was the most dramatic outcome of the impact of the economic crisis on the CIS gas sector. The onset of the economic crisis made both sides less ready to compromise, and was a factor in the dispute running out of both sides' control.

Elements in the agreement made in January that brought the supply interruption to an end – and, specifically, the high contract quantities and onerous take-or-pay conditions for Ukraine – could become triggers of a new dispute. Given the depth of the economic crisis in Ukraine, a stabilisation of its relationship with Russia in the near future seems unlikely.

A significant turning-point in the Russo-Ukrainian relationship is likely to be the completion of at least one of the Nord Stream pipelines, which will substantially weaken Ukraine's bargaining position. Transit diversification will probably bring the era of supply disruptions to an end, but the possibilities for, and urgency of, reducing Ukrainian consumption – and indeed consumption in all the CIS countries – will remain.

APPENDIX: ADDITIONAL TABLES

Table 7. Gazprom: summary sales information, 2008

	Volume of gas, Bcm	Revenue
Domestic sales	292.2 (51%)	\$16.317 bn (18%)
Sales to FSU countries	96.5 (17%)	\$12.999 bn (14%)
Sales to Europe and other countries	184.4 (32%)	\$63.543 bn (68%)
Total	573.1	\$92.859 bn

Source: Gazprom, *Programme for the Issuance of Loan Participation Notes*, July 2009, pp. 14 and 115

Note: Gross sales (including excise tax and customs duties, and net of VAT). Gazprom's own sales, plus sales of non-Russian gas by Gazprom trading subsidiaries abroad such as Gazprom Marketing & Trading, are included.

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Table 8. Total gross natural gas imports into OECD Europe

	2006		2007		2008		10.08		11.08		12.08		1.09	
	Vol, Bcm	Vol, Bcm	Vol, Bcm	Vol, Bcm	Vol, Bcm	Vol, Bcm	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year
FSU	130.84	130.5	142.25				10.91	95.28%	11.06	79.98%	12.26	85.57%	9.3	65.40%
Norway	65.81	71.97	82.09				7.53	110.79%	7.62	108%	8.53	112.94%	8.59	113.89%
Algeria	57.49	51.65	53.07				4.38	103.96%	4.2	85.27%	4.24	80.13%	5.02	90.84%
Total import	415.4	414.9	438.3				35.85	99.50%	37.33	88.86%	39.52	87.71%	39.22	87.95%

	2.09		3.09		4.09		5.09		6.09	
	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year
FSU	8.7	64.61%	8.91	64.35%	7.24	57.86%	9.8	78.59%	10.17	89.93%
Norway	7.95	115.11%	8.24	106.32%	7.01	100.14%	6.64	106.58%	6.08	105.74%
Algeria	4.43	86.63%	4.35	85.83%	4.22	90.40%	3.59	82.53%	3.96	91.03%
Total import	34.94	86.29%	34.88	82.27%	30.93	82.32%	32.02	91.28%	32.26	96.56%

	7.09		8.09		9.09	
	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year	Vol, Bcm	as % of same month, prev. year
FSU	10.76	106.32%	10.61	112.75%	11.26	107.03%
Norway	6.44	97.42%	7.52	151.00%	7.18	141.61%
Algeria	4.05	95.74%	3.58	101.99%	3.74	99.73%
Total import	34.60	107.29%	32.56	116.20%	33.14	108.94%

Source: IEA, *Monthly Natural Gas Survey*, various issues

Table 9. Rate of gas consumption in Russia, billions of cubic metres per day

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	1.42	1.4	1.21	0.94	0.67	0.56	0.56	0.58	0.66	0.95	1.21	1.26
2007	1.26	1.44	1.15	0.95	0.69	0.58	0.57	0.6	0.7	0.95	1.28	1.39
2008	1.44	1.35	1.15	0.9	0.68	0.6	0.6	0.63	0.75	0.95	1.09	1.25
2009	1.32	1.3	n/a	0.95	0.62							

Source: Energy Research Institute of the Russian Academy of Sciences

Table 10. Russian gas production projections 2009-2012 - Bcm

	<u>2008 actual</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
<u>Gazprom</u>	549.7	450-510	507.5	510.6	532.8
<u>Others</u>	113.9	70-130	115.5	123.4	116.2
<u>Russia total</u>	663.6	580	623	630	649

Source: projections for Gazprom production, from the company; for total production, from economic development ministry, as reported in Interfax, Russian Oil and Gas Weekly, 17 September 2009, p. 24. Projections for other producers: residual.

Table 11. Ukrainian gas demand, 2007-09 (Bcm)

Month	<u>1.07</u>	<u>2.07</u>	<u>3.07</u>	<u>4.07</u>	<u>5.07</u>	<u>6.07</u>	<u>7.07</u>	<u>8.07</u>	<u>9.07</u>	<u>10.07</u>	<u>11.07</u>	<u>12.07</u>
Reported total	8.249	8.332	6.982	4.956	3.756	3.192	3.195	3.299	3.849	5.785	8.623	9.383
Technical gas	0.565	0.687	0.526	0.443	0.544	0.546	0.496	0.476	0.501	0.564	0.76	0.862
Households and public sector	2.888	2.897	2.111	1.431	0.632	0.334	0.34	0.335	0.548	1.379	2.672	3.117
District heating	1.727	1.841	1.424	0.579	0.217	0.149	0.132	0.125	0.181	0.558	1.549	1.835
Other in low price bands	0.001	0.179	0.148	0.081	0.053	0.044	0.045	0.046	0.049	0.088	0.134	0.184
Industry: power sector	0.949	0.93	0.778	0.473	0.342	0.342	0.326	0.439	0.526	0.793	1.301	1.327
Industry: metals	0.884	0.843	0.881	0.802	0.779	0.738	0.759	0.785	0.796	0.816	0.859	0.916
Industry: other	1.234	1.134	1.261	1.228	1.242	1.08	1.142	1.139	1.297	1.676	1.483	1.326
Other	0.016	0.015	0.017	0.015	0.014	0.016	0.016	0.016	0.015	0.015	0.017	0.017
Total	8.264	8.526	7.146	5.052	3.823	3.249	3.256	3.361	3.913	5.889	8.775	9.584
Total minus reported total	0.015	0.194	0.164	0.096	0.067	0.057	0.061	0.062	0.064	0.104	0.152	0.201
Month	<u>1.08</u>	<u>2.08</u>	<u>3.08</u>	<u>4.08</u>	<u>5.08</u>	<u>6.08</u>	<u>7.08</u>	<u>8.08</u>	<u>9.08</u>	<u>10.08</u>	<u>11.08</u>	<u>12.08</u>
Reported total	10.1	8.316	7.123	4.929	3.935	3.269	3.085	3.119	3.752	4.719	6.328	7.422
Technical gas	0.711	0.813	0.752	0.626	0.609	0.562	0.425	0.45	0.515	0.5	0.424	0.536
Households and public sector	3.633	2.793	2.192	1.299	0.699	0.358	0.344	0.33	0.736	1.298	2.26	3.018
District heating	2.069	1.667	1.326	0.535	0.237	0.154	0.125	0.127	0.165	0.371	1.2	1.689
Other in low price bands	0.1	0.164	0.139	0.083	0.055	0.049	0.048	0.05	0.052	0.09	0.1	0.161
Industry: power sector	0.825	0.992	0.785	0.501	0.357	0.309	0.294	0.34	0.539	0.572	0.408	0.823
Industry: metals	0.927	0.867	0.764	0.731	0.751	0.705	0.718	0.68	0.591	0.486	0.406	0.479
Industry: other	1.821	1.185	1.305	1.237	1.282	1.181	1.179	1.192	1.206	1.493	1.519	0.876
Other	0.007	0.016	0.016	0.016	0.015	0.018	0.016	0.016	0.015	0.016	0.007	0.016
Total	10.093	8.497	7.279	5.028	4.005	3.336	3.149	3.185	3.819	4.826	6.324	7.598
Total minus reported total	-0.007	0.18	0.156	0.99	0.07	0.067	0.064	0.066	0.067	0.107	-0.004	0.176
Month	<u>1.09</u>	<u>2.09</u>	<u>3.09</u>	<u>4.09</u>	<u>5.09</u>	<u>6.09</u>	<u>7.09</u>	<u>8.09</u>				
Reported total	7.432	5.984	5.939	3.191	2.266	1.98	2.113	2.218				
Technical gas	0.532	0.416	0.399	0.301	0.346	0.346	0.439	0.419				
Households and public sector	3.385	2.57	2.485	1.155	0.562	0.34	0.326	0.355				
District heating	1.917	1.507	1.5	0.515	0.204	0.137	0.120	0.138				
Other in low price bands	0.212	0.166	0.139	0.083	0.055	0.049	0.045	0.045				
Industry: power sector	0.693	0.553	0.566	0.278	0.141	0.138	0.152	0.175				
Industry: metals	0.422	0.414	0.412	0.331	0.355	0.367	0.454	0.466				
Industry: other	0.482	0.52	0.575	0.612	0.659	0.652	0.622	0.664				
Other	0.017	0.015	0.017	0.015	0.015	0.015	0.015	0.016				
Total	7.66	6.161	6.093	3.29	2.337	2.044	2.173	2.278				
Total minus reported total	0.228	0.177	0.154	0.099	0.071	0.064	0.06	0.06				

Notes. The statistics are issued by the energy ministry and published in *Energobiznes*. The reported total is the row "distribution: Ukraine" in the ministry's tables, which is usually lower than the total of the consuming sectors. I have added the totals myself, and included a row showing the difference. In January and November 2008, the ministry used different categories, and in April 2008 no statistics were published. I have extrapolated these figures from the available information.

Table 12. IMF economic growth forecasts

	<u>2008 actual</u>	<u>2009 projection</u>	<u>2010 projection</u>
Advanced economies as a whole	+0.6%	-3.4%	+1.3%
Emerging and developing economies as a whole	+6.0%	+1.7%	+5.1%
European Union	+1.0%	-4.2%	+0.5%
Central and eastern Europe	+3.0%	-5.0%	+1.8%
CIS	+5.5%	-6.7%	+2.1%
Developing Asia (i.e. China and India)	+7.6%	+6.2%	+7.3%
CIS net energy exporters	+5.8%	-6.1%	+2.1%
CIS net energy importers	+4.4%	-9.1%	+2.4%

Note: CIS energy exporters includes Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan. CIS energy importers includes Armenia, Belarus, Georgia, Kyrgyzstan, Moldova, Mongolia, Tajikistan and Ukraine.

Source: IMF, *World Economic Outlook*, October 2009, pp. 2 and 81.

Table 13. Gazprom investment plan for 2009
(Selected items not summing to totals)

<u>Gazprom investment plan for 2009, as approved in December 2008</u>	<u>bn rubles</u>
Programme for the development of the Yamal peninsula, including:	209.7
- the Bovanenkovo-Ukhta pipeline system	110.1
- development of the Bovanenkovo field	80.4
- Obsk-Bovanenkovo railway	19.2
Upgrading and maintenance of transport infrastructure	50.6
Drilling at operating fields	46.6
Development of Shtokman and Prirazlomnoye fields	37.1
Nord Stream, Griazovets-Vyborg sector	32.7
Enhanced recovery measures at existing fields	24.5
Programme for the devpm't of East Siberia and the Far East, incl:	24.5
- programme of gas supply to Kamchatka region	11.8
- Sakhalin-Khabarovsk-Vladivostok pipeline	11.5
Preparatory work for future construction	23.6
Pochinki-Griazovets pipeline	20.2
Development of gas condensate horizons at Zapolyarnoe	19.4
Compressor station at Zapolyarnoe	16.0
High-pressure pipeline from Zapolyarnoe	14.5
Transport infrastructure under the regional gasification programme	11.6
Construction of storage capacity	11.0
Gas processing	9.5
Exploration	8.4
Projects in the social sphere, including:	7.8
- Krasnaya Polyana skiing complex	3.3
- Reception building at Esto-Sadok (Sochi)	2.3
<u>Capital expenditures</u>	<u>699.88</u>
Purchase of additional shares in Gazprom Sakhalin Holdings	45.5
Investment in Gazoenergeticheskaiia kompaniia	30.7
Development of Prirazlomnoe field	22.1
Investment in Shtokman Development AG	18.5
Investment in capital of Novourengoi gas-chemical complex	18.6
<u>Long-term financial investments</u>	<u>220.56</u>

Source: Gazprom / Elena Mazneva, "Minus 26%", *Vedomosti*, 14 July 2009.

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