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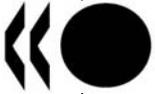
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RUSSIA'S GAS SECTOR: THE ENDLESS WAIT FOR REFORM?

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by **Rudiger Ahrend and William Tompson**

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ABSTRACT/ RESUME

Russia's Gas Sector: The Endless Wait for Reform?

The gas industry is perhaps Russia's least reformed major sector. Prices are regulated, exports are monopolised and the domestic market is dominated by a state-controlled, vertically integrated monopolist, OAO Gazprom. Gazprom combines commercial and regulatory functions, and maintains tight control over the sector's infrastructure and over information flows within it. The sector as it is currently constituted is highly unlikely to be able to sustain sufficient output growth to satisfy both rising export commitments and domestic demand. There is significant potential for accelerating the growth of non-Gazprom production and making gas supply in Russia more competitive, but this will require fundamental reform. The proposals for reform advanced in the paper address two sets of issues. First, there is an urgent need to increase transparency in the sector and transfer many of the regulatory functions now performed by Gazprom to state bodies. Secondly, there is a longer-term need for a considerable degree of unbundling of Gazprom. In particular, it would be desirable to remove control of the sector's transport infrastructure from the company and to revise the arrangements governing gas exports to non-CIS states, which are currently monopolised by Gazprom. At the same time, recent increases in domestic gas tariffs must continue until internal gas prices rise above full, long-term cost-recovery levels.

JEL classification: L95, O52, P28, Q32, Q48

Keywords: Russia; economy; natural gas; infrastructure; pipelines; monopoly; competition; state ownership; Gazprom; subsidies; regulation; energy; exports; ring fence.

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Le secteur du gaz en Russie : l'attente interminable pour des réformes?

L'industrie du gaz est peut être le secteur majeur le moins réformé en Russie. Les prix sont réglementés, les exportations sont effectuées par un monopole, et le marché intérieur est dominé par OAO Gazprom, un monopole verticalement intégré sous contrôle de l'État. Gazprom mélange des fonctions commerciales et de réglementation, et contrôle étroitement aussi bien l'infrastructure que les flux d'information à l'intérieur du secteur. De ce fait il est fortement improbable que le secteur dans sa forme actuelle soit capable d'atteindre une croissance de la production suffisante pour satisfaire aussi bien les engagements croissants d'exportations et la demande domestique. Le potentiel pour accroître la croissance de la production de gaz par d'autres producteurs que Gazprom, et de rendre l'offre de gaz en Russie plus compétitive, est fort. Mais l'exploitation de ce potentiel va nécessiter des réformes fondamentales. Les réformes proposées dans cet article concernent deux types de questions. Premièrement, il y a un besoin urgent d'accroître la transparence dans le secteur et de transférer une bonne partie de fonctions de réglementation qui sont en ce moment réalisées par Gazprom à des propres entités de réglementation étatique. Deuxièmement, il y a la nécessité de réaliser un degré important de séparation des activités. En particulier, il sera souhaitable que le contrôle de l'infrastructure de transport du secteur soit séparé de Gazprom, et que les arrangements liés à l'exportation de gaz dans les pays hors CIS, sur lequel Gazprom détient un monopole, soient révisés. En même temps, les augmentations récentes dans les prix intérieurs du gaz devront continuer jusqu'à ce que les prix internes atteignent un niveau permettant de récupérer l'entièreté des coûts de production à long terme.

Classification JEL: L95, O52, P28, Q32, Q48

Mots-clés: Russie; économie; gaz; infrastructure; pipelines; monopole; compétition; entreprises d'État; Gazprom; subventions; réglementation; énergie; exportations; cantonnement.

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RUSSIA'S GAS SECTOR: THE ENDLESS WAIT FOR REFORM?

Rudiger Ahrend and William Tompson¹

Introduction

The natural gas industry is probably the least marketised sector in the Russian economy. Despite — or perhaps because of — its enormous significance, it has proved extraordinarily successful in preserving the transitional institutional structures created in 1992 and in resisting attempts to increase the role of market forces in its operation. While a largely unreformed gas industry demonstrated considerable resilience during the early years of the post-communist transition, it is increasingly clear that the failure to allow greater play to market forces in the sector represents a threat to its long-term development and, by extension, to Russia's long-term growth prospects². This article will examine the state of the natural gas industry and the prospects for its development before considering options for reform. The first section describes the structure of the sector and its role in the Russian economy. This is followed by a discussion of the way the domestic market operates. Both these sections highlight the anomalous position of the vertically integrated gas monopoly OAO Gazprom. Though constituted as a joint-stock company, Gazprom operates in many ways as an arm of the state, combining commercial and regulatory functions and maintaining tight control over the sector's infrastructure and over information flows within it. Gazprom's control over information is particularly important, as it renders opaque much of what happens in the sector. The third section considers the major sources of pressure for change, chief among which is the need to stimulate investment in gas production in order to sustain output over the long term.

The proposals for reform advanced in the final section address two sets of issues. First, there is an urgent need to increase transparency in the sector and transfer many of the regulatory functions now performed by Gazprom to state bodies. Secondly, there is a longer-term need for much more fundamental restructuring, involving a considerable degree of unbundling of Gazprom. In particular, it would be desirable to remove control of the sector's transport infrastructure from the company and to revise the arrangements governing gas exports to non-CIS states, which are currently monopolised by Gazprom. At the same time, recent increases in domestic gas tariffs must continue until internal gas prices rise above full, long-term cost-recovery levels. Full, cost-reflective pricing of gas on the domestic market will be crucial to securing the industry's future.

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1. The authors work in the Non-Member Economies Division of the OECD Economics Department. This paper draws on material originally prepared for the *OECD Economic Survey of the Russian Federation*, which was discussed in the OECD's Economic and Development Review Committee on 25 May 2004 and published in July. The authors are grateful to the many Russian and western officials, experts and businessmen, too numerous to list here by name, who discussed the gas sector with the *Survey* team. The authors are also indebted to colleagues in the Economics Department, in particular Andrew Dean, Val Koromzay, and Silvana Malle, for useful discussions, comments, and drafting suggestions. Special thanks go to Corinne Chanteloup and Anne Legendre for technical assistance, as well as Muriel Duluc and Lillie Kee for secretarial assistance.
 2. See OECD (2004).

Overview of the sector

It is difficult to exaggerate the significance of Russia's natural gas industry, both nationally and internationally. The sector provides roughly 50 per cent of Russia's primary energy supply, including 53 per cent of the fuel consumed by the electricity sector.³ In 2002, the gas sector generated around 8 per cent of GDP and accounted for roughly 20 per cent of export earnings. At the end of 2002, the Russian Federation accounted for 30.5 per cent of the world's proven reserves of natural gas, with roughly 47.5 trillion cubic metres in explored reserves.⁴ Some 74.6 per cent of this total is located in Western Siberia, with European Russia (including the Barents Sea shelf) accounting for 16.1 per cent and Eastern Siberia and the Far East together for the remaining 9.3 per cent.⁵ In 2002, Russia accounted for 22 per cent of world natural gas production and 30 per cent of exports (excluding exports of liquid natural gas). Russian gas supplied roughly 20 per cent of gas consumption in the EU-15 and roughly two-thirds in Central Europe.⁶ Moreover, as European demand continues to rise and the resources of other producers in the vicinity of Europe are increasingly committed, Russia's role in European gas supply will grow.⁷

The state-controlled concern OAO Gazprom, created in 1992, dominates both the up- and down-stream sectors. Gazprom holds the licences to fields holding 28.8 trillion cubic metres of proven reserves, some 55.1 per cent of the Russian total. Other producers hold 28.2 per cent, with 16.7 per cent remaining unallocated.⁸ Gazprom's share of total production, though falling, is even greater, at 87.6 per cent in 2003 (see Table 1). The company owns and operates Russia's network of high-pressure inter-regional gas pipelines, which at over 150,000km is the longest in the world, and it is the only owner of gas storage sites in Russia, operating 22 underground storage facilities.⁹ Further downstream, Gazprom's role in local distribution networks has risen markedly since the mid-1990s, chiefly as a result of debt-for-equity swaps or insolvencies. By late 2003, it owned blocking stakes in more than 70 per cent of Russia's gas-distribution organisations, and it controlled many of the largest ones.¹⁰ Gazprom has a monopoly on all gas exports outside the Commonwealth of Independent States (CIS). Indeed, the government has put Gazprom in charge of coordinating East Siberian gas export projects, despite the fact that it has no stake in the companies holding licences for the fields in question. As a result of its acquisition of the Siberian-Urals Oil and Gas Chemicals Company (Sibur), the company also holds a monopoly on gas processing in Russia.¹¹ Control of Sibur makes Gazprom the monopsony buyer of the associated gas produced by Russian oil companies as a by-product of their oil extraction.¹² Finally, Gazprom has acquired over the years a vast array of holdings in such sectors as banking, insurance, agriculture, mass media and construction. Some of these form part of Gazprom's social infrastructure, while others were acquired in settlement of debts or for

3. 'Energeticheskaya strategiya' (2003:21); IEA (2003b, II.165).

4. BP (2003:20). This estimate includes reserves in categories A, B and C1. According to the Ministry of Economic Development & Trade ('O kontseptsii' 2002:3), reserves in categories C2, D and E could constitute a further 100tcm.

5. 'O kontseptsii' (2002:2-3).

6. OECD calculations based on data in IEA (2003a).

7. IEA (2002b:177-96).

8. 'Doklad' (2003:15).

9. IEA (2002a:119).

10. *Vedomosti*, 23 December 2003.

11. Gazprom already owned gas-processing plants Astrakhan and Orenburg; the purchase of Sibur brought control of the nine major processing plants in Siberia.

12. The only major exception to this is the oil company Surgutneftegaz, which alone among the Russian oil companies has a significant gas-processing plant of its own.

strategic or political reasons. The company is committed to disposing of many of its non-core assets, but this is proving a slow process.

Table 1. Russian natural gas production and exports, 1999-2003

	Billion cubic meters				
	1999	2000	2001	2002	2003
Total	592.1	584.2	581.0	595.3	616.5
Gazprom	545.6	523.3	511.9	523.8	540.2
Oil companies [†]	29.8	31.0	32.2	34.8	40.4
Independents	13.2	26.4	33.2	36.5	35.7
Other*	3.4	3.7	0.3	0.2	0.2
Non-Gazprom share of production (per cent)	7.9	10.4	11.9	12.0	12.4
Exports to non-CIS markets	131	134	132	134	142

[†]Includes associated gas.

*Produced under joint venture and/or production-sharing agreements.

Source: RF Ministry of Energy.

Gazprom's position imposes significant costs on the company. The company is required to supply the domestic market with gas at regulated prices which are well below full cost-recovery levels (see Annex 1). Indeed, Gazprom maintained until 2004 that it was losing money on the domestic market even without taking account of the full cost of capital — its domestic revenues were below short-run costs. Only in 2004 did the company indicate that it expected to break even on domestic sales.¹³ Low domestic prices mean that Gazprom's exports, which take roughly one-third of its output, account for about three-quarters of its income.¹⁴ Moreover, Gazprom's investment plans must be agreed with the state a year at a time. This combination of uncertainty about future revenues and investment make planning difficult. Gazprom also supports a massive social infrastructure, with entire towns to maintain in remote and inhospitable regions of the country. Finally, Gazprom must closely coordinate its activities in all spheres with the authorities. As noted in OECD (2002:106) it can at times be difficult even to identify where the state budget ends and Gazprom's begins. Even company officials acknowledge that Gazprom operates in many respects as a quasi-ministry.

Since 2001, the state has moved to tighten its grip over the company, apparently with the aim of ultimately raising the state's 38.37 per cent holding to an outright majority stake; at present, the state controls the company only with the aid of the 15.9 per cent of Gazprom shares that are held by the company itself, effectively as treasury stock.¹⁵ An array of restrictions on the acquisition of Gazprom shares by non-residents remains in place, as does the 'ring fence' separating the domestic share market from the market in ADRs held abroad. Even the domestic share market is tightly regulated. A presidential decree restricts trading in Gazprom domestic shares to just four stock exchanges (Moscow, St Petersburg, Siberia and Yekaterinburg). Although the government and the company have been committed for several years to organising the trading of Gazprom shares on the Moscow Inter-bank Currency Exchange, where

13. Interfax, 28 May 2004.

14. Since export prices in the CIS are still relatively low, this income is overwhelmingly derived from the 25 per cent or so of output that Gazprom exports to non-CIS markets, chiefly Turkey and Central and Western Europe.

15. In early 2004, the state owned 38.37 per cent of Gazprom's equity. Russian legal entities owned 35.07 per cent, Russian individuals 15.06 per cent and foreign investors 11.5 per cent. However, 15.9 per cent of Gazprom's stock — almost half the total held by Russian corporates — was held by the company or its subsidiaries.

turnover tends to be much higher than on the stock exchanges, this has not occurred. In early 2001, the President appointed a working group to explore the ring-fence issue. After missing several deadlines, the working group produced a set of timid proposals in September 2001, none of which have yet been implemented. However, the authorities in early 2004 returned to the issue of the ring-fence, indicating that it would be lifted soon — probably by end-2004. This would be a welcome development.

The other players in Russia's up-stream gas sector consist of Russian oil companies (ROCs), which held around 10.7tcm in proven reserves in 2002,¹⁶ and a handful of independent gas companies (see Table 1). Their share of total production is rising steadily, albeit from a low base, and both Gazprom and the government are counting on this trend to continue for some time. A large part of the ROCs' production consists of associated gas, although 20-25 per cent of this is flared, because it is uneconomic to process and sell it.¹⁷ However, the oil companies' interest in gas production as a separate activity has also been rising, and they account for most of the growth in non-Gazprom production observed in the last few years. The independent gas producers largely occupy production niches left to them by Gazprom and the ROCs, often concentrating on deeper-lying, more complex deposits.¹⁸ Finding such niches is important, because non-Gazprom producers are able to operate in the sector only to the extent that they can reach agreement on cooperation with Gazprom or its regional subsidiaries. This cooperation sometimes rests on relatively informal ties between Gazprom managers and the independent producers, rather than on formal agreements with OAO Gazprom itself.

Cooperation with Gazprom is particularly crucial when it comes to pipeline access. The ROCs consume a significant portion of their own output, and a good deal of non-Gazprom production is sold to power stations and other consumers in the producing regions, without ever entering the inter-regional trunk pipeline network. In order to market the rest, non-Gazprom producers must be able to get it into the pipeline. While there is some direct dealing between non-Gazprom producers and final consumers, most gas marketed outside the producing area is sold at the wellhead, either to Gazprom itself or to gas trading companies, many of which are thought to be linked to Gazprom managers, if not to Gazprom as a company. Since 1998, non-Gazprom producers have been free to sell gas at market prices. Gazprom or the trading companies are free to re-sell gas purchased from non-Gazprom producers at prices well above regulated levels. Associated gas, however, is an exception. It must be processed before it enters the network and is sold at extremely low regulated prices to gas-processing plants, almost all of which are controlled by Gazprom. Oil companies have therefore chosen to flare much of their associated gas rather than marketing it.¹⁹

Pricing, subsidies and the operation of the domestic market

The domestic gas market is not really a market at all. It is rather a rationing mechanism with market-based activity at the fringes. Rationing is, unsurprisingly, the result of artificially low regulated gas prices. Gazprom, rather than the state, controls the rationing process. The company and the government negotiate

16. 'O kontseptsii' (2002:6).

17. 'Doklad' (2003:5).

18. The gas extracted by the independents generally requires more processing than is needed for the relatively shallow cenomanian deposits that continue to account for most of Gazprom's production.

19. In addition to the regular purification processes, associated gas must go through additional processes because it has too high a liquid content that must be separated out before it can be sold. (This liquid itself has a high energy content and can also be processed and sold.) Associated gas is regulated from the point it enters this processing facility and there is a set price at which it is purchased. Gazprom has recently concluded a long-term agreement to buy significant volumes of associated gas from the oil company Lukoil, but the gas giant's chokehold on the associated gas market remains a problem.

a ‘gas balance’ for the country towards the end of each year, for the year ahead. This determines the quantity of gas that Gazprom must supply to domestic consumers at regulated prices. Given the difference between export and domestic prices, Gazprom has every incentive to keep its domestic deliveries as low as possible. It is significant therefore that, when the gas balance is being agreed, it is Gazprom that has all the relevant information about the production, pipeline capacity and export commitments. The balance, in short, is largely determined by Gazprom. Once the aggregate figure is agreed, industrial consumers bid for the gas they need. Bids are ‘corrected’ (*i.e.* reduced) by Gazprom, which then informs consumers of their quotas for the coming year. Any additional gas they need must be purchased at higher prices, either from non-Gazprom producers or from Gazprom itself, which re-sells a good deal of other producers’ gas and also sells some of its own output at higher prices to those who exceed their quotas.²⁰ In principle, the amount Gazprom offers to supply the market reflects real supply constraints, but when consumers exceed their limits, there is never a shortage of gas — they just pay more for what they consume.

The administration of this rationing system is wholly opaque. Some consumers get what they bid for, while others are allocated far less than their bids and must purchase the rest at higher prices. There are no clearly defined principles of distribution. Even the overall results of the distribution are unknown; the government does not appear to have full data on the actual allocation of regulated-price gas to domestic customers. Gazprom officials merely describe the allocation of quotas as a matter for ‘negotiation’.²¹ Some consumers report that their quotas have simply been frozen, so that reliance on other sources grows in line with their gas demand; this appears to be the case with respect to the power sector. There appears to be no clear overall pattern in other sectors, although there does seem to be an incumbency effect: consumers need administrative permission to bid for gas at regulated tariffs for any *new* facility, and this is unlikely to be given if Gazprom objects. In practice, quotas may be adjusted each quarter. Consumer enterprises thus have no certainty about the quantity that will be supplied at regulated tariffs more than three months ahead. Quotas for delivery of regulated-price gas can and do change at very short notice. There are no long-term gas supply contracts. This absence of long-term contracts is particularly a problem for anyone contemplating investment in any gas-intensive activity. Finally, regulated-price gas quotas are apparently administered on the basis of even rates of consumption, without regard for the consumer’s actual usage patterns. Thus, a consumer enterprise may forfeit ‘unused’ allocations during periods of low consumption (including weekends and holidays) while paying penalties for over-consumption during the week.²²

On the production side, a similar situation prevails with respect to the management of the pipeline network. The principle of third-party access to pipelines is established in law, but it is virtually unenforceable. Uncertainty about pipeline access constitutes a major impediment to the conclusion of long-term contracts between non-Gazprom producers and their customers (other than Gazprom). Gazprom is only required to grant access if there is sufficient capacity available in the system. Gazprom may also refuse access on technical grounds, such as the quality of the gas.²³ The Central Production-Dispatch Unit (TsPDU), which controls dispatch in the sector, remains an integral part of Gazprom itself, and information on dispatch is a closely held secret. No state or private body actually has the data on the level or structure

20. If consumers exceed quota, Gazprom may sell them ‘above-quota’ (*sverkhlimitnyi*) gas at higher prices, but these mark-ups are regulated. The permitted mark-ups for such gas rise in winter and fall in summer.

21. Priority is, however, given to allocations of gas for the household sector, and there are principles governing allocation to organisations financed from federal and regional budgets.

22. ‘Doklad’ (2003:8). Note that the gas forfeited during periods of low usage may subsequently be sold to consumers at higher prices as ‘above-quota’ (*sverkhlimitnyi*) gas.

23. ‘Ob obespechenii dostupa’ (2001). The decree in question was adopted in July 1997 but amended in 1999, 2000 and 2001.

of pipeline usage that would be needed to challenge Gazprom's decisions.²⁴ Denial of access can be challenged *ex post* by appeal to the government commission that oversees the oil and gas pipeline networks or in the courts, but these are time-consuming procedures with uncertain prospects of success. Moreover, the need to meet obligations to customers means that independents may have to accept Gazprom's terms, while the awareness that they cannot operate effectively without Gazprom's cooperation is a significant deterrent to challenging any given decision.

Gazprom denies that it exploits its control over the pipeline network to put other producers at a disadvantage and points to the threefold rise in volumes of non-Gazprom gas being transported through the system between 1998 and 2002.²⁵ However, it is unclear how much of this gas is produced by other Russian producers; much of it appears to consist of Central Asian gas either imported into Russia or transiting Russia to other markets, such as Ukraine. The oil companies and the independent producers continue to complain of discrimination. Representatives of non-Gazprom producers claim that Gazprom has sometimes declared that there was no capacity available on a given route when the producers knew that there was; unable to challenge Gazprom, however, they were forced in such cases to accept longer, costlier routes in order to fulfil their contractual obligations.²⁶ Given that it does not wish to supply any more gas to the domestic market than it has to, Gazprom has no incentive to keep other producers out. Indeed, it wishes their role to increase. However, control over the network gives it considerable scope to ensure that the smaller producers market their gas on terms that suit Gazprom. Thus, regardless of the rights and wrongs of particular instances of restricted access, the fact remains that Gazprom can discriminate against other producers and has incentives to do so. The establishment of an effective third-party access regime for the sector's infrastructure is likely to be absolutely crucial to the outlook for investment by non-Gazprom producers.

Underlying all of this regulation and rationing is the unsustainable under-pricing of natural gas, which constitutes a subsidy from the gas sector to the rest of the economy. While there is a good deal of debate about what the 'true' cost-reflective price of gas production in Russia might be, there is general agreement that the regulated tariffs set by the Federal Energy Commission (FEC) and its successor, the Federal Tariff Service (FST) are still below full cost-recovery levels.²⁷ Tariff regulation also involves two forms of cross-subsidy:

- The first is regional. Since 1997, the authorities have set differential tariffs for seven pricing zones defined according to distance from the wellhead (see Table 2). This reduced inter-regional subsidy substantially, but it appears that tariffs still do not fully reflect the differences in the cost of supplying different regions.
- Households continue to pay significantly less than industrial consumers. The size of the difference between industrial and household tariffs tends to increase with distance from the

24. Should an independent producer challenge Gazprom's decision by appealing to the Government Commission on the Use of the Long-Distance Oil and Gas Pipeline Systems, the Commission can require Gazprom to provide information on the presence of spare capacity in the system.

25. These rose from 28.1bcm in 1998 to 83.1bcm in 2002.

26. Itera was told in 2003 that there was no pipeline capacity available to take its gas from the Beregovoy field to the trunk pipelines, and three of the independent producers had a highly public dispute with Gazprom in the autumn of 2003, after the monopolist threatened to cut their access by one-third or more.

27. Under Presidential Decree No. 314 of 9 March 2004, the FEC has been reorganised into the Federal Tariff Service. This involves, in addition to the change of name, the transfer of certain of its powers to other bodies as well as the extension of its tariff-setting authority.

wellhead (see Table 2) so that there is less overall variation in household tariffs than industrial tariffs.

Table 2. **Domestic natural gas tariffs, January 2004**

USD per 1 000 cubic meters

Pricing zone	Industrial consumers	Households	Household as percentage of industrial
Zero*	18.24	16.09	88.2
One	21.98	17.06	77.6
Two	25.62	18.59	72.5
Three	28.71	19.97	69.6
Four	30.20	20.39	67.5
Five	31.62	20.80	65.8
Six	32.49	21.15	65.1

*The Yamalo-Nenets Autonomous District, which accounts for 87 per cent of natural gas production.

Source: Federal Energy Commission.

As noted in OECD (2002), the subsidy resulting from low prices was, during the 1990s, compounded by the widespread settlement of energy debts in non-monetary form and the failure to penalise non-payment. The aggregate subsidy provided to the rest of the economy by the electricity and gas sectors reached around 5.0-5.5 per cent of GDP in 1997-2000.²⁸ The situation has changed substantially since 2000. Gas tariffs have risen relatively fast in rouble terms, while the real appreciation of the rouble has helped further to reduce the differential between domestic and export prices (see Tables 3 and 4). At the same time, the barter and non-payments problems have largely abated: Gazprom itself now reports 98 per cent cash collection rates.²⁹ Russia's May 2004 agreement with the European Union on WTO accession issues reportedly commits the government to increasing domestic gas prices to USD 37-42/tcm in 2006 and USD 49-57/tcm in 2010. These price hikes are in fact somewhat smaller than the increases envisaged by the government's 2003 energy strategy, but they are all the more significant for being enshrined in a binding international agreement.³⁰ These are levels well above the average price of roughly USD 23.40 in late 2003 and also above all but the highest estimates of full cost-recovery levels.

Table 3. **Natural gas tariff increases and CPI/PPI inflation**

December/December, per cent

	1998	1999	2000	2001	2002	2003
Households	36.9	27.6	16.5	19.9	33.6	34.8
<i>CPI</i>	84.5	36.6	20.1	18.8	15.1	12.0
Industrial consumers	-3.4	1.2	31.9	26.8	27.1	31.8
<i>PPI</i>	23.0	71.4	31.6	10.6	17.5	13.0

Note: Goskomstat's index of producer prices for gas shows much higher rates of increase, reinforcing the impression that transport tariffs have been squeezed.

Source: Goskomstat RF.

28. OECD (2002:121-32).

29. Ryazanov and Medvedev (2004).

30. *Vedomosti*, 24 May 2004; 'Energeticheskaya strategiya' (2003:8, 32). For 2006, the strategy gives a range of USD 36-39/tcm in one place and USD 40-41 in another.

Table 4. Average natural gas tariffs for households and industrial consumers

	USD/1 000 cubic meters						
	1997	1998	1999	2000	2001	2002	2003
Households	19.2	15.6	7.9	8.0	9.3	11.6	15.9
Industrial consumers	46.0	26.5	10.6	12.2	14.9	17.6	23.8
Exports to non-CIS Europe	84.2	80.5	60.0	103.5	119.1	107.3	128.1

Source: Federal Energy Commission, Goskomstat RF, United Financial Group.

Differences in estimates of the true level of cost recovery largely reflect disagreements as to Gazprom's actual costs and as to the allowance made for future capital investment (see Annex 1). Estimates are also influenced by assessments of the sector's future development: gas production is likely to be cheaper to sustain in a reformed, more competitive sector than in a sector which continues to be organised on current lines. In the absence of greater competition on the domestic market, including the sale of a larger share of Russia's gas at free prices, it may be impossible to specify exactly the long-run marginal cost of gas production with confidence. However, there is at least an emerging 'zone of consensus'. If allowance is made for the need to replace fixed assets and/or develop new fields and transport infrastructure, as well as to cover all variable costs, most estimates point to a figure of around USD 35-45/tcm (see Annex 1). This is close to the USD 36-41 range that the government is committed to reaching by 2005 or 2006. The average regulated tariff for industrial consumers in early 2004, at around USD 30-31/tcm (roughly USD 20/tcm for households), would suggest that there is still a significant subsidy flowing from the gas industry to other sectors. However, even now, the aggregate subsidy is smaller than it might appear, because industrial consumers are already buying a rapidly growing share of their gas at prices well above the regulated tariffs.

If industrial consumers' gas requirements exceed the limited volumes that they are allocated by Gazprom at regulated prices, they must buy the balance at higher prices. The opacity of Gazprom's allocation of regulated-price gas means that there are no comprehensive official data covering actual gas consumption patterns and prices. However, a November 2003 OECD survey of industrial gas consumers suggests that Russian industry purchases roughly 22 per cent of the gas it consumes at above-FEC/FST prices, at an average mark-up to the regulated tariff of just under 32 per cent.³¹ This means that the average effective price for industry is a bit more than 7 per cent above regulated prices. This may not seem to be an enormous mark-up, but on an industry-wide basis, the sums are significant. Moreover, the aggregate figure masks enormous differences in the ability of different enterprises and sectors to obtain gas at FEC/FST tariffs; while some large industrial consumers are able to buy all their gas from Gazprom at regulated tariffs, many others buy 30-50 per cent of their needs at prices far above regulated tariffs. Such differences underscore the arbitrariness of the current arrangements for allocating regulated-price gas, although they also provide evidence of the willingness and ability of many industrial enterprises to pay more for gas if they need to.

The average regulated industrial tariff in late 2003 was around USD 24.20/tcm, suggesting an effective tariff for industry of around USD 26.00; the wholesale price of gas intended for the household sector was roughly USD 15.90. On domestic consumption outside the gas industry of roughly 388bcm, this would imply a gas subsidy to the rest of the economy of USD 4.2-8.1bn (assuming a long-run marginal cost of USD 35-45/tcm). The impact on this estimate of the latest increases in gas tariffs gives some

31. Annex 2 provides details of the survey of industrial consumers.

indication of how fast the subsidy is shrinking. Estimates based on the January 2004 average tariff levels of roughly USD 20/tcm for household gas and USD 30.50 for other consumers put the subsidy at USD 1.8-5.7bn, again assuming a long-run marginal cost of between USD 35 and USD 45/tcm.³² A large share of this implicit gas subsidy goes to the electricity and heat industries and is then passed on to industry, households and other sectors via lower tariffs for those two commodities. If this pass-through subsidy is allocated to industry, households and other sectors on the basis of the breakdown of heat and electricity consumption, then it emerges that Russian industry (outside the power sector) received around 40 per cent of the total subsidy in 2003. The aggregate gas subsidy to industry appears to have been in the range of USD 1.7-3.5bn. The rest went to households, services and agriculture. However, because industrial tariffs are rapidly approaching the USD 35-45/tcm range, the subsidy to industry is shrinking rapidly: estimates employing January 2004 tariffs yield a net implicit subsidy to industry of between USD 480m and USD 2.3bn (around 0.1-0.4 per cent of GDP — the former figure reflects how close actual tariffs now are to the USD 35 threshold). At present, therefore, it appears that households rather than industrial consumers are receiving the largest share of the gas subsidy and that this share is increasing as a result of the fact that wholesale prices of gas for the household sector are approaching cost-recovery levels much less quickly than wholesale prices for other consumers.

Gas price rises have been, and continue to be, difficult for industry and households to absorb, as they feed through into higher prices for electricity as well as for gas consumed directly by plants and households. Price increases must therefore proceed gradually, if they are not to lead to unacceptable social or economic consequences. At the same time, however, the impact of higher gas prices should be offset to some extent by more efficient energy use. Russia's economy remains extremely energy-intensive. In 2003, energy consumption per dollar of GDP was estimated to be 2.3 times the world average and 3.1 times the European average (calculated on the basis of purchasing power parity).³³ To some extent, such high-ratios of energy consumption to output are a product of factors such as geography, climate, the structure of industrial production in Russia and the energy inefficiency of much of the industrial plant and infrastructure left over from the Soviet period. These factors have been compounded by the sharp fall in real GDP during the 1990s, when output fell far faster than energy consumption; the energy intensity of GDP has been falling steadily since growth resumed in 1999. However, very high levels of energy consumption per unit of output also reflect the persistence of artificially low energy prices, which reduce incentives to improve energy efficiency. In most industrial sectors, energy consumption per unit produced is far higher in Russia than in the majority of European states, or even the United States, while domestic power and heat supplies are reckoned by both Russian and foreign observers to be extremely energy inefficient.³⁴ The latest draft of the government's energy strategy estimates that Russia could reduce consumption of energy per unit of output by 39-47 per cent from current levels, but cost-reflective pricing of energy will be needed to create the incentives to pursue improvements in energy efficiency.³⁵

Investment needs

Ultimately, the overriding challenge facing Russia's gas sector is to renovate its decaying infrastructure, while investing in exploration and development of gas fields in order to raise production sufficiently to satisfy a growing domestic market and fulfil its export obligations. Gazprom is currently committed to stabilising production at around 530bcm per annum through 2020, though some observers

32. This estimate of the subsidy takes into account the mark-up on gas sold at above-FEC prices.

33. 'Energeticheskaya strategiya', (2003:21). See also the even more pessimistic estimates in ISDEI (2003).

34. For a detailed discussion of Russia's energy efficiency potential, see IEA (2002a:229-37).

35. 'Energeticheskaya strategiya', (2003:21).

doubt its ability to sustain this level of output.³⁶ At the same time, Gazprom's non-CIS exports are to rise from 140bcm in 2003³⁷ to around 180-200bcm per year by 2008,³⁸ against a backdrop of steadily rising domestic demand. The latest version of the government's energy strategy envisages overall production reaching 635-665bcm by 2010 and 680-730bcm by 2020. The strategy sees Gazprom raising output to 580-590bcm over the period to 2020, rather than stabilising production. Yet even this more optimistic scenario would necessitate a sharp rise in non-Gazprom production, from 71.3bcm in 2003 to 105-115bcm in 2010 and 140-150bcm in 2020.³⁹ Regardless of the accuracy of the strategy's projections, or of Gazprom's own, the underlying reality is that Gazprom is committed to raising exports sharply against a backdrop of production that will at best rise modestly and may fall. This points to a growing, indeed crucial, role for non-Gazprom sources of supply.

Substantial capital investment will be required if Gazprom is to sustain, let alone increase, gas production over the medium-to-long term. Its existing resource base and infrastructure are both in need of renovation. At present, three major fields (Urengoi, Yamburg and Medvezh'e) account for around three-quarters of Gazprom's gas production and about 65 per cent of total Russian production.⁴⁰ All three are in decline.⁴¹ There are five known super-giant fields still to be brought into full production, but all are located in the far north and will be extremely expensive to develop in view of complex geological conditions and the Arctic climate. Gazprom expects development of fields on the Yamal Peninsula and in the Ob-Taz shelf to cost up to USD 25bn, with the transport infrastructure costing another USD 40bn. The off-shore fields in the Barents Sea would cost an estimated USD 10-15bn to bring into production, exclusive of the cost of a pipeline to the shore.⁴² The only major new field Gazprom has developed since the 1980s is Zapolyarnoe, which came on-stream in the fourth quarter of 2001 after a decade of work and is meant to produce up to 100bcm per annum by 2005.⁴³ The lag time of 5-7 years between the initiation of a major development and the beginning of production suggests that no other super-giants will be brought on-stream before 2010.

Much depends on the rate of output decline in the Urengoi, Yamburg and Medvezh'e fields, which has been the subject of much debate. Gazprom and the Russian authorities appear to anticipate a fairly dramatic decline in the coming years, with output falling by more than 7 per cent a year.⁴⁴ Some independent observers concur.⁴⁵ The IEA takes a more sanguine view, suggesting that the production

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36. The figure of 530bcm appears to remain the official position of the company (see <http://www.gazprom.ru/articles/strategy.shtml>); however, Gazprom CEO Aleksei Miller has spoken of figures as high as 580-590bcm by 2020 and 610-630bcm by 2030.
 37. This was the preliminary figure given by Gazprom deputy CEO Yuri Komarov; Reuters, 20 January 2004.
 38. OTAC (2003:18) notes that Gazprom's contracted export commitments amount to 180bcm in 2008, while IEA (2002a:110) anticipates an even higher level of around 200bcm.
 39. 'Energeticheskaya strategiya' (2003:31).
 40. In 2001, these three fields produced 68 per cent of Gazprom's output, but this share has been slipping from year to year. See 'O kontseptsii' (2002:3) and IEA (2002a:112).
 41. 'Energeticheskaya strategiya' (2003:31); see also the charts in IEA (2002a:114). Urengoi's cenomanian reserves are reckoned to be over 65 per cent depleted and those of Medvezh'e more than 75 per cent. Yamburg is only around 54 per cent depleted but its production, too, appears to have peaked.
 42. 'Yamal manil' (2002).
 43. OTAC (2003:24).
 44. IEA (2002a:113), based on 'Energeticheskaya strategiya' (2000). It should be noted that the revised energy strategy adopted in 2003 omits such estimates.
 45. OTAC (2003:18 and Appendix 1). For a far more bullish view on likely Russian gas production, see Landes *et al.* (2004).

profile of the Medvezh'e field, which is the oldest of the three, points to the possibility of stemming the decline of the other fields given sufficient investment in production infrastructure.⁴⁶ However, Medvezh'e's trajectory may not provide a good basis for comparison. Urengoi and Yamburg, which are newer fields than Medvezh'e, were developed during a period characterised by the overly aggressive, often damaging, development of new oil and gas deposits in Siberia. The critical question, therefore, is how much damage such over-production and poor field practices did to the fields' long-term production profiles.⁴⁷ Gazprom is perhaps in the best position to assess this, but many of its critics believe that it has an economic interest in exaggerating the expected declines in order to increase the pressure on the authorities for higher prices. If the optimists are correct, Gazprom's output is expected to be flat or slowly rising at best. If the pessimists are right, then Gazprom may even be unable to sustain output at the planned level of 530bcm over the medium term. If the latter view is correct, it is much more difficult to see how a combination of imports and new production will be able to offset declining output from the older fields.

In any case, there is no doubt that the development of substantial production from new fields will be required to offset the decline of the Urengoi, Yamburg and Medvezh'e. It is critical that this new supply be sought from the lowest-cost sources, within Russia and abroad. This points to an increasing role for the oil companies and the independents. Both the government and the company expect the non-Gazprom share of total production to increase from the current 12-13 per cent to around 20 per cent in 2020. Also important will be the supply of Central Asian gas under agreements concluded with Kazakhstan, Uzbekistan and Turkmenistan. The last of these, signed in April 2003, is by far the most important. Russian purchases of Turkmen gas are to rise from 5-6bcm in 2004 to 6-7bcm in 2005 and 10bcm in 2006. The volume of Turkmen gas sales to Russia will then jump sharply, to 60-70bcm in 2007 and 70-80bcm per annum from 2009. Russia has indicated a willingness to buy all the gas that Turkmenistan produces. While the deal was criticised within Russia on the grounds that the price was too high, it will allow Gazprom to postpone development of Yamal, which it would probably be unable to finance in the near term anyway. However, it is far from clear that Turkmen imports will prove cheaper over the long run than increased production by non-Gazprom producers within Russia, given that Turkmen gas reaches the Russian border at USD 50/tcm.⁴⁸ Moreover, while the Turkmen deal allows Gazprom to delay the exploitation of Yamal, it also enables the company to delay restructuring of the domestic sector in such a way as to encourage non-Gazprom production, while effectively removing Central Asian gas as a potential competitor on export markets.⁴⁹

The transport and distribution networks are arguably in more urgent need of investment than Gazprom's upstream business. Over 70 per cent of Russia's high-pressure gas pipelines were commissioned before 1985 and an estimated 14 per cent are beyond their anticipated lifespans.⁵⁰ The average age of Russian gas pipelines is close to 22 years.⁵¹ According to Gazprom, the high-pressure network has lost around 70bcm in capacity since 1992 as a result of lack of investment to replace worn-out

46. IEA (2002a:113-14). The debate largely concerns the possible consequences of poor field practices in the 1980s on the long-term productivity of the three fields.

47. This issue is addressed in both IEA (2002a) and OTAC (2003).

48. Of this, USD 44/tcm is paid to Turkmenistan and USD 6/tcm constitutes transit costs. Until 2007, Russia will pay half of the Turkmen portion (USD 22/tcm) in bartered goods.

49. There is also some concern in Europe about Gazprom's apparent strategy of 'locking up' Central Asian and Transcaucasian gas supplies by means of such mechanisms as the Central Asian deals alluded to above and a long-term gas cooperation agreement concluded with Georgia in 2003, which has put Gazprom in an even stronger position *vis-à-vis* the Georgian, Armenian and Turkish markets.

50. IEA (2002a:118).

51. IEA (2003d:215).

lines.⁵² Yet the authorities anticipate a need to build no less than 28,000km in new pipelines by 2020, as production shifts from the existing three giants to other fields. Not surprisingly, therefore, the transport network has consumed far more of Gazprom's capital investment in recent years than its production activities have done. So far, however, the level of investment has been insufficient to halt the decline in the condition of the pipelines. The Ministry of Economic Development and Trade estimates that investment in pipelines during 1990-2002 was about 29 per cent of what was actually required to maintain them. Further downstream, the situation is even worse. The financial weakness of the gas-distribution organisations, and of regional and municipal authorities, means that there has been far less investment in medium- and low-pressure distribution networks, which are generally old and have not been as well maintained as the high-pressure lines.

Gas sector reform

The Ministry of Economic Development and Trade has prepared several sets of proposals on gas-sector reform, including the restructuring of Gazprom itself. There has been almost no progress, however, thanks chiefly to resistance from Gazprom, which argues that its organisational integrity is critical to the smooth functioning of the nation's gas-supply system. It has, not surprisingly, rejected plans to break it up. Indeed, until early 2004, it rejected even proposals for reorganising its subsidiaries or producing separate accounts by line of business, as it saw any such internal restructuring as the first step towards its eventual dismemberment.⁵³ On more than one occasion, Gazprom has actively and publicly lobbied to prevent the cabinet from considering even the ministry's more moderate proposals, which concern the internal reorganisation of Gazprom's businesses in the interests of transparency, rather than its break-up.⁵⁴ Gazprom nevertheless claims that they would lead to the destabilisation of the sector, the break-up of the company and the domination of the industry by Russia's oil companies.⁵⁵ Gazprom's vision of the sector's future needs is limited to a few basic elements: higher domestic tariffs, the right to sell some gas at free prices on the domestic market, a growing role for non-Gazprom producers in supplying *domestic* consumers and the liberalisation of the market in Gazprom shares. Structural change is out of the question. However, the company has begun to respond to pressure for greater financial transparency. Greater openness on the company's part would be a very positive step.

Gazprom is undoubtedly right to emphasise the need to raise domestic prices. Although this problem is far less acute than it was, raising domestic prices to full cost-recovery levels remains a key reform priority. Higher domestic prices, however, will not of themselves secure the future of Russia's gas industry. A more fundamental restructuring of Gazprom should be considered. Both Gazprom and the government acknowledge that non-Gazprom production must grow rapidly if Russia's gas industry is to develop successfully, but the current architecture of the sector constitutes a significant impediment to such growth, restricting both small producers' access to the market and consumers' freedom to choose their suppliers. Despite Gazprom's dominant position, there is significant potential for accelerating the growth of non-Gazprom production and making gas supply in Russia more competitive. This potential cannot be realised until Gazprom's domestic rivals can be assured of equal treatment, which is impossible as long as Gazprom controls both the information flows and the infrastructure. There is an immediate need to increase transparency in the sector and also to transfer what are in essence regulatory functions from Gazprom to the state. Over the longer term, Gazprom's natural monopoly/infrastructure provision functions should be separated from its potentially competitive activities.

52. Interfax, 17 December 2003.

53. For a particularly full and at times impassioned statement of Gazprom's position, see Gazprom (2003a and 2003b).

54. See 'O strukturnykh' (2003) and the company's reaction as set out in Gazprom (2003b).

55. Gazprom (2003b:2).

Information and regulation

Gazprom has made some progress in becoming more transparent as a company in recent years, most notably in its regular publication of international standards accounts.⁵⁶ However, its interactions with its subsidiaries as well as its operation of the infrastructure and its supply of the domestic market remain largely opaque to outsiders. It is essential that the regulator, in particular, have timely, accurate and full information on the structure of pipeline usage and on the allocation of regulated-price gas. The quality of regulation depends directly on the quality of the information at the regulator's disposal. This may require, at the least, a degree of internal reorganisation so as to achieve a clearer separation of accounts with respect to production, transport and dispatch. Greater transparency in the company's other activities would also be welcome. Relationships like that between Gazprom and the Hungarian-registered Eural Trans Gas have recently revived concerns about the possible use of trading intermediaries to extract value from the company.⁵⁷ Fortunately, prospects for progress on this front have recently improved. In March 2004, Gazprom CEO Aleksei Miller declared that by 2005, the company and its subsidiaries would unbundle their accounts according to activity — production, transport, processing, storage and distribution. Financial unbundling will allow for transparency in the setting of transport tariffs, a critical element of any effective third-party access regime. It will also facilitate efforts to assess where efficiency can be improved or where investment is needed.⁵⁸

A second and related priority is minimising Gazprom's role as a *de facto* regulator in the gas sector, particularly as regards the allocation of regulated-price gas and pipeline access. The need for rationing regulated-price gas supplies should in any case disappear as domestic tariffs rise to levels that make it more attractive for gas producers to supply domestic consumers, while at the same time reducing consumers' appetite for gas. Nevertheless, it would in principle be preferable for the state to take over the allocation of quotas for regulated-price gas for as long as this system continues. Indeed, the state should take over the preparation of the country's 'gas balance', which — inasmuch as it is closely linked to the question of a depletion strategy for Russia's gas resources — is arguably yet another sovereign function that is largely performed by Gazprom. The gas balance, moreover, should be prepared in a transparent fashion on the basis of a depletion strategy defined by the state. Whether Gazprom or the state performs actually rations the gas to be sold at regulated prices (and there are doubts about the state's capacity to take this function over in practice), there needs to be greater transparency and less scope for arbitrary action than at present. Clear rules and principles governing the allocation *and* administration of these quotas should be formulated and implemented. Once set, moreover, quotas should be binding, so as to give greater predictability to consumers.

As similar set of issues need to be resolved with respect to the transport and storage infrastructure. The main issue on a day-to-day basis concerns arrangements governing third-party access to the pipeline. At the least, it should be easier to challenge discriminatory behaviour and also to secure effective remedies *ex post*. However, it would be far better to insist on greater transparency regarding the utilisation of the pipeline network and a greater *ex ante* role for an impartial regulator in handling applications for access from other producers as part of a transparent, non-discriminatory third-party access regime. The strategic issue is the question of infrastructure investment and development, which is also largely in Gazprom's

56. OECD (2002:111).

57. Gazprom shareholders and other observers have criticised the company's decision to extend loan guarantees to the little known Eural Trans Gas (ETG) and to appoint ETG as the agent for transporting 36bcm per annum of Turkmen gas to Ukraine. According to Russian media, ETG subsequently signed a contract to ship Turkmen gas to Poland via Ukraine, thus competing with Gazprom in that market. See *Moscow Times*, 27 February 2003 and 27 November 2003; and *Vedomosti*, 27 February 2003, 22 March 2003, 4 November 2003, 21 November 2003, 24 November 2003 and 26 December 2003.

58. *Vedomosti*, 19 March 2004; *Gazeta*, 19 March 2004.

hands, even in areas in which it has no direct involvement in gas production (*e.g.* its coordinating role with respect to exports from Eastern Siberia). The potential conflict of interest here is obvious, since decisions about where to direct investment in the infrastructure can have an enormous impact on the viability of different producers.

Tariff policy, too, needs to be both more transparent and more consistent. The government is committed to raising tariffs to cost-recovery levels but is understandably reluctant to risk lower growth and higher inflation by raising them too rapidly. A big-bang approach to raising gas tariffs would hit households and industry extremely hard. Both need time to adjust. However, the need for a more gradual approach makes it all the more important that the authorities commit credibly to a price path for regulated tariffs and to clear, transparent methodologies for calculating them. This would, *inter alia*, make it easier to introduce longer-term contracts into the sector. Various drafts of the government's energy strategy and other official documents have outlined medium-term targets for gas prices, but price increases to date have consistently been smaller than these targets would imply. The targets for gas price increases included May 2004 agreement with the EU on WTO entry should therefore be seen as an important step forward, for they represent a binding commitment undertaken by the government in an international agreement. In principle, gas tariffs are fixed by the FST. In practice, they are set by the government and are adjusted once or even twice a year. Moreover, the increases often look somewhat *ad hoc*, the product of bargaining between the government and Gazprom. The government's tariff restraint also reflects a belief that Gazprom could and should be more efficient than it is. Cutting back Gazprom's investment plans and granting smaller tariff increases appear to be partly aimed at forcing the company to operate more efficiently and at getting a clearer sense of its true costs — which are extremely difficult for outsiders to assess — by 'testing its pain threshold'.⁵⁹

The need for a credible price path is related to a more general need for a fair, stable, effective and transparent regulatory framework in which regulatory decisions are taken by an independent, expert regulatory authority rather than a market player. The experience of gas-market liberalisation in other countries suggests that such a regulatory structure is essential to ensuring market access to producers and choice of supplier to consumers.⁶⁰ Given that there is little or no prospect of Gazprom being broken up in the near term, the sector is destined to remain highly monopolised and therefore highly regulated. In such a heavily regulated sector, the credibility and stability of regulatory arrangements are critical to encouraging investment, but the FEC was always relatively weak and under-resourced compared with both Gazprom and other state institutions. Nor was the now abolished Ministry for Anti-Monopoly Policy (MAP) ever a very effective force, despite its attempts to challenge Gazprom. As noted above, the FEC has been transformed into a Federal Tariff Service, taking over the tariff-setting functions of various other bodies and transferring its oversight functions to the new Federal Anti-Monopoly Service, which has replaced MAP. It is important that, when this reorganisation is completed, the resulting institutions have considerably greater independence and regulatory capacity than their predecessors.

Separating the infrastructure

Improved transparency and better regulation of pipeline access are unlikely to be an optimal long-term solution. As long as Gazprom owns and controls the sector's dispatch, transport and storage infrastructure, it will be able to discriminate among producers. Better regulation might make it harder to use some of the cruder and more obvious means of discrimination, but that is about all. Over the long term, therefore, the question of separating the sector's infrastructure from Gazprom's production assets is likely

59. Recent statements by the Ministry of Economic Development and Trade, justifying limited tariff increases, appear to reflect this thinking. The government appears to have employed a similar strategy *vis-à-vis* the electricity and rail monopolies.

60. OECD (2000b:8).

to demand attention. The experience of other countries highlights the importance of equal access to infrastructure and transparent, non-discriminatory rules for all; it also demonstrates the difficulty of ensuring such access in the absence of vertical separation of the pipeline network from upstream producers.⁶¹

Pittman (2001) highlights three concerns that should be borne in mind when considering the question of a greater or lesser degree of vertical separation: the economies of scope that may be lost in the event of vertical separation; the ease or difficulty with which a regulator (or disadvantaged producer) is likely to detect discrimination in network access and to be able to act to secure a remedy in a timely fashion; and the potential welfare losses arising from discrimination in access. Gazprom insists that the scope economies that would be lost in the event of any degree of vertical separation would be enormous, arguing that the smooth functioning of the entire system depends on the closest possible integration of production, dispatch and transport operations.⁶² There are, to be sure, coordination issues: storage capacity is limited and uninterrupted delivery to consumers is critical. However, natural gas does not present the coordination problems present in, for example, electricity or telecommunications networks, and the experience of other countries suggests that the tight integration on which Gazprom insists is unnecessary.

The latter two factors point to the need for vertical separation. The regulator is very weak and the infrastructure operator enjoys a huge informational advantage over all other participants in the system. At the same time, seasonal variations in the price of gas and the large share of the price to end users that consists of transport costs (estimates vary in the range of 60-80 per cent) suggest that discrimination could be very profitable for a network operator also involved in production. In short, Gazprom at present has both the means and the motive to abuse its position. This applies, moreover, not merely to the day-to-day management of the infrastructure but also to questions concerning investment in the pipeline network, the resolution of which could have a significant impact on the prospects of different producers and the value of their assets. The determination of where the sector's infrastructure should be upgraded or expanded certainly should not be left to one producer.

While the *prima facie* case for vertical separation is compelling, the necessary conditions for unbundling are not in place at present and would take some time to put in place. However, the separation of accounts via the organisation of Gazprom's transport and dispatch infrastructure into joint-stock companies owned by Gazprom should be an important first step. This will increase financial transparency and would also provide a mechanism for the direct oversight of transport and dispatch operations by representatives of the state, as Gazprom's major shareholder. Other interim measures may also be required. In the longer term, however, it will probably be desirable to reorganise the transport and dispatch infrastructure into state-owned monopolies separate from Gazprom, perhaps via a restructuring of the monopolist that offered private shareholders the option of swapping stakes in the infrastructure companies for the state's shares in the production business (or businesses) that remained. Provided that the swap terms were reasonable, most private investors would probably prefer stakes in the upstream business rather than in a regulated natural monopoly that was guaranteed to produce steady but low returns.

Other aspects of Gazprom's increasing vertical integration should also be reconsidered. While Gazprom's growing involvement in distribution is an understandable by-product of the financial problems experienced by the distribution companies, it represents a further tightening of Gazprom's grip on all segments of the gas industry and is in the longer term likely to be a further obstacle to consumer choice and market access for other producers. In early 2004, the Ministry for Anti-Monopoly Policy found that Gazprom had, with the aid of the FEC, abused its position in the downstream sector in violation of anti-

61. See OECD (2000b).

62. Gazprom (2003b:3).

monopoly legislation.⁶³ Gazprom contested the decision, but the fact remains that its dominant position creates opportunities for abuse and also runs counter to the government's Energy Strategy to 2020, which envisages the emergence of greater competition in distribution and sales, and its medium-term economic strategy, which is committed to checking trends towards greater vertical integration in the sector.⁶⁴ Gazprom's *de facto* monopoly over gas-processing raises similar questions. Its acquisition of Sibur gave it effective control over access to the market for producers of associated gas, apart from Surgutneftegaz.⁶⁵ At the least, it would be expedient to put in place arrangements that would prevent any abuse of Gazprom's dominant position in gas processing. Given that gas-processing is not a natural monopoly activity, there could be a role for competition law here rather than for more sector-specific measures.

Though a number of critics have proposed breaking up Gazprom's production monopoly, this is probably the least problematic aspect of its structure. The size of the fields, the difficult geological and climatic conditions, and the extraordinary investment in infrastructure required to develop production in such remote locations mean that the economies of scale are very large. Smaller companies might well be more efficiently managed, and it is likely that the 'baby Gazproms' which resulted from any dismantling of the production monopoly would still be fairly large companies, possessing a significant portion of world gas reserves. Even so, such spin-off companies would probably need to form consortia in order to develop the new super-giants in the Arctic. This would require them either to band together again or to attract large foreign producers as partners. The former path would raise questions about the point of breaking up Gazprom in the first place. The latter option could be commercially attractive, but the Russian authorities might well take the view that a larger Gazprom would have greater bargaining power *vis-à-vis* foreign companies. Moreover, a Gazprom with a production monopoly might find it easier to raise financing for the development of new fields than would the successor companies.

In any case, breaking up Gazprom's production monopoly can hardly be regarded as a priority. The principal issue to be addressed in any reform of the domestic gas sector is not the production monopoly, which could be eroded very rapidly if non-Gazprom producers enjoyed better access to the pipeline network, fewer regulatory restrictions and greater incentives to develop their reserves. Nor is the principal problem artificially low gas tariffs, although the consensus remains that domestic tariffs are probably still below cost-recovery levels. Tariffs are rising and will continue to rise, with rouble appreciation bringing about an even faster convergence of internal and external tariff levels in dollar terms. The main problem is Gazprom's combination of commercial and regulatory functions: it controls transport and dispatch and it determines which customers will receive how much gas at regulated prices. Moreover, its performance of these dispatch, transport and allocative functions remains largely opaque.

In pursuing the kind of restructuring outlined above, great care must be taken to minimise the risks of disruption to the economy. The unbundling of Gazprom's infrastructure is not something that can or should be executed in haste. Moreover, it would be unwise to unbundle Gazprom to any significant degree without first putting in place a framework for effective, independent and credible economic regulation. Dismantling vertically integrated monopolies can create serious problems where market and regulatory institutions are weak or under-developed.⁶⁶ Finally, any attempt substantially to restructure Gazprom, let alone to break it up, would have to take account not only of the rights of its private minority shareholders (it would require a qualified majority of shares, which the state could not muster on its own even with the benefit of treasury

63. RIA TEK, 6 February 2004; for details of the case, see *Vedomosti*, 23 December 2003, and *Kommersant*", 23 December 2003.

64. 'Energeticheskaya strategiya' (2003:33). For a more explicit statement, see section 3.5.1 of the government's medium-term economic strategy ('Osnovnye napravleniya', 2001).

65. IEA (2002a:121-2).

66. Joskow (1998).

stock) but also of the position of those who hold Gazprom debt. However, these concerns should not be seen as grounds for delay. On the contrary, they all point to the conclusion that gas-sector reform will be a long and complex process. The longer it is put off, the greater the risk that it will eventually be undertaken precipitously in response to falling production.

Exports: monopoly, taxation or liberalisation?

There remains, finally, the question of Gazprom's monopoly on non-CIS exports. There are two issues to be borne in mind when considering export policy: the management of the transition to cost-reflective pricing on the domestic market and the potential rents arising from Russia's market power. The immediate problem is that domestic prices are well below the level of mid-cycle export netbacks (that is, below average export prices even when transport costs are taken into account) and will probably remain so, at least for some years to come, despite the authorities' commitment to further tariff increases. As long as a gap exists between domestic prices and export netbacks, Russia has no choice but to control exports. Otherwise, producers will export as much as possible, while neglecting the domestic market. Investment patterns risk being similarly distorted, resulting in a focus on export-oriented projects and the neglect of the infrastructure needed to serve domestic consumers.⁶⁷ Mechanisms are therefore needed to ensure that producers are largely indifferent as to whether they supply the internal or export markets. The critical point is that they need to be able to make a profit in either.

Currently, Gazprom's export monopoly is the mechanism by which Russia seeks to assure adequate supplies of gas on the domestic market in the face of the large differential between domestic and export prices. The state captures a share of this differential through a 30 per cent export tax, but much of it is captured by Gazprom. Gazprom passes some of it on to domestic consumers (especially households) via low regulated gas prices — *i.e.* reverse dumping. This has long been the company's principal justification for the export monopoly. As domestic prices rise, however, this is becoming less of a burden for Gazprom and thus less of a justification for allowing it to go on appropriating this differential.⁶⁸ A significant share of it is split between Gazprom insiders and shareholders (including the state), and part of it is probably dissipated through Gazprom's own inefficiency. This is hardly an optimal solution. Enterprises in the sector should obviously be allowed to make reasonable profits but there is no reason why they should be entitled to capture the large wedge between production costs and export netbacks.⁶⁹ It would probably be desirable to allow producers to *share* in this wedge to some extent in order to stimulate badly needed investment in the gas industry, but there is no reason for this to apply to Gazprom alone. Non-Gazprom producers would welcome the opportunity to export. While higher domestic prices and a better pipeline-access regime are clearly their main priorities, they continue to press for some export opportunities, not least because that would make it easier to raise finance abroad.⁷⁰ Some have indicated a willingness to

67. There is some evidence to suggest that Gazprom's own investment behaviour in recent years reflects such distorted incentives.

68. The export tax, imposed at the beginning of 2004, appears to reflect, at least in part, the authorities' belief that the burden of domestic subsidy borne by Gazprom is easing. In any case, to the extent that Gazprom is required to provide a subsidy to the domestic economy in the form of below-cost gas sales, it would probably be more efficient to compensate the company via direct budgetary support rather than by allowing it to capture a very large share of the export rents.

69. The gas in the ground is state property. Any rents that accrue in the process of extracting and selling it should in principle accrue to the state on behalf of the population.

70. See Soyuzgaz (2003a); and Itera (2003). This view is also expressed by executives of a number of Russian and western companies involved in gas production in Russia.

share some of Gazprom's 'social obligations' with respect to domestic supply in return for access to export markets.⁷¹

Any revision of non-CIS export channels should be handled with great care. Gazprom and Gazeksport are known internationally and have a good reputation as reliable suppliers: no significant curtailment of gas supplies to Western consumer countries has occurred since Soviet gas exports began in 1968.⁷² In a business where security of supply is a key issue, this is a significant factor, which is why many non-Gazprom producers indicate that they would be happy to export gas via Gazeksport in the first instance. Gazprom's existing export contracts, moreover, must be honoured. However, the authorities could begin by relaxing Gazprom's grip on emerging new export routes (*e.g.* from Eastern Siberia to Asia) and by taking steps to allow other producers to participate in fulfilling new export contracts, even if this is done through Gazeksport.⁷³ Ensuring some export access for producers developing new fields could be particularly useful.

These steps would be welcome developments. However, as long as there remains a significant gap between domestic prices and the average export netbacks across the cycle, there are more efficient ways of trying to maintain equilibrium within the two markets. One option would be to shift control over Gazeksport from Gazprom to the state, while leaving it as the sole channel for Russian gas exports to non-CIS markets. It would need to become a small and transparent company, separate from Gazprom and having only one task: buying gas in Russia and exporting it. Such a structure could ensure that all Russian gas companies enjoyed equal opportunities to export a share of their production, which would stimulate activity in the gas sector. Alternatively, the state could allow all producers direct access to export markets but under the condition that price formulae for all exporters were set via negotiations between European consumers and a single consortium of gas producers.⁷⁴ While neither of these options is without its problems, both would appear to be preferable to the status quo. Under either arrangement, it would be important for the authorities to consider carefully the allocation of the differential between domestic and export prices. In the case of the latter option, this would probably involve modifying the existing 30 per cent export tax so as to make it more sensitive to fluctuations in export prices. Such a change could help to counter the distortion of producers' incentives created by the wedge between domestic and export prices, at least as long as this wedge remains significant. As more gas is sold on the domestic market at free prices, it would also be possible to use such a modified export tax to link domestic prices to external prices and thus provide producers with incentives to respond to developments on international markets. At the same time, it might serve as a stabilising mechanism, dampening the impact of large short-term movements in gas prices on the domestic economy.

The longer-term outlook for gas exports is less clear. OECD (2002) makes the point that, in contrast to oil, Russia is not merely a price-taker in natural gas but enjoys some market power. Gazprom does not simply face a 'world price' for gas: if it increases exports to particular markets, gas prices on those markets will fall significantly. Thus, while Russia cannot dictate gas prices on export markets, it can certainly influence them by increasing or curtailing exports. Liberalising exports could thus allow the loss of the rents arising from this market power, which would then accrue to non-Russian consumers. Russia's market power in gas means that it can price-discriminate in the gas sector to some extent and arguably has an interest in doing so. This would not be inefficient, as long as internal gas prices are at or above long-run marginal cost (LRMC) — that is, at or above the price that would emerge in an efficient, competitive

71. Soyuzgaz (2003b:7).

72. IEA (2004), Appendix 2 to Chapter 7.

73. Their ability to compete for such contracts would, of course, depend on fair access to the pipeline network and transparent setting of transport tariffs; otherwise, Gazprom might still be able to exclude them.

74. See OECD (2002:151).

market. Over the longer term, this market power may diminish. This will depend not only on the development of the Russian gas sector but also on the presence in export markets of alternative suppliers able to replace Russian gas at competitive prices and on the prices of alternative fuels. In this context, developments with respect to liquefied natural gas could be of particular importance, as could the liberalisation of the European gas market.⁷⁵ However, as long as Russia does enjoy a degree of market power in Europe and elsewhere, the Russian authorities will have to consider carefully how best to manage natural gas exports.

75. See IEA (2004), especially Chapter 7 and Appendix 2 to Chapter 7.

ANNEX 1. ENERGY PRICES AND IMPLICIT SUBSIDIES TO HOUSEHOLDS AND INDUSTRY

The pricing of electricity and natural gas on the Russian domestic market has been the subject of a great deal of controversy in recent years, both at home and abroad. During the 1990s, the effective prices of electricity and gas for Russian consumers were held well below cost-recovery levels, raising questions about the long-term sustainability of production. Within Russia, this led to conflict between energy industries lobbying for higher domestic prices and domestic consumers, who understandably resisted rapid tariff increases. Abroad, domestic gas pricing, in particular, became a major issue in Russia's negotiations with the European Union on WTO accession. The EU maintains that artificially low domestic energy prices constitute an unfair subsidy to Russian industry and insisted that Russia commit to phased increases in domestic gas prices over the period to 2010 as a condition of WTO entry. The Russian authorities, for their part, have long agreed that current practices with respect to the domestic gas market are undesirable and unsustainable over the long term. However, they long resisted pressure to address this issue in WTO accession negotiations, noting that no similar demands had ever been presented to any previous aspirant member of the WTO.⁷⁶ Though committed to raising domestic gas tariffs substantially over the medium term, the government was unwilling to force the pace of this difficult adjustment as a condition of WTO entry. In the end, the price hikes agreed with the European Commission in May 2004 were roughly in line with the increases already envisaged by the government's energy strategy for the period to 2006 and were actually somewhat lower than the increases planned for the period from 2006 to 2010.⁷⁷ The Russia-EU deal must nevertheless be regarded as a significant advance, however, for unlike the energy strategy, it represents a binding commitment on the part of the government.

The present annex provides a brief overview of the debates about Russian domestic energy prices and the question of whether or not they constitute an unfair subsidy to Russian industry. The first section lays out the background to the problem, highlighting the quasi-fiscal role played by the gas and electricity monopolies, OAO Gazprom and RAO UES, during the 1990s. This is followed by consideration of the 'appropriate' level of domestic natural gas and electricity prices. The final section returns to the issue of WTO accession and considers the question of whether current policies and practices extend an unfair subsidy to Russian industrial firms. The conclusions reached may be summarised as follows:

- The energy sector continues to extend a significant implicit subsidy to the rest of the economy, chiefly at the expense of the natural gas industry. However, the level of subsidy has declined substantially in recent years and is likely to disappear well before the end of the decade.

76. That said, it should be noted that there is not a 'standard package' of WTO accession requirements; membership is a matter for negotiation and many members have accepted 'non-standard' conditions, such as the obligation to sign WTO plurilateral agreements on such issues as government procurement. Moreover, price liberalisation has been a requirement for former centrally planned economies wishing to join the WTO; however, while Russian gas production remains so highly monopolised, there is a strong argument that domestic prices will have to be regulated. The question is merely at what level.

77. The Russia-EU deal reportedly calls for prices to rise to \$37-42/tcm by 2006 and \$49-57/tcm by 2010; the corresponding figures in the government's 2003 energy strategy are \$36-41 and \$59-64 respectively. See 'Energeticheskaya strategiya' (2003:33) and Vedomosti, 24 May 2004.

- There is no reason to expect that Russian domestic energy prices will, or necessarily should, approach West European levels in the foreseeable future. What is critical is that domestic prices rise to levels above the long-run marginal cost of production of gas and electricity.
- While under-priced gas and electricity are both wasteful and unsustainable over the long term, current policies and practices are compatible with WTO rules.

Background

During the 1990s, federal and regional authorities proved reluctant to impose hard budget constraints on large industrial enterprises, many of which would not have been viable in market conditions. Ensuring their survival required extending substantial subsidies. These were initially provided by the state budget and, via the emission of soft credits, the central bank. Gradually, the authorities curtailed budgetary support and soft credits to industry, but they did not enforce hard budget constraints. Instead, the role of subsidy provider shifted to the energy and infrastructure monopolies, particularly Gazprom and UES. The instruments used were not soft credits or budgetary funds but payment arrears, barter and money surrogates. Gazprom and UES not only could not bankrupt non-payers; they were in most cases unable even to cut off their supplies. The monopolies therefore sought whatever payment they could — bills of exchange (*vekselya*), bartered goods, tax offsets and other money surrogates.

The real value of bartered goods and money surrogates was far less (often 50-70 per cent less) than their nominal value, but the monopolies were at least able to extract *something* from their debtors. However, once the practice became widespread, even solvent customers resorted to it, purchasing UES *vekselya* on secondary markets and using them to settle electricity bills at their nominal value. By 1997-98, only about 15-20 per cent of electricity supplied was paid for with money, and 60-65 per cent was settled via non-monetary means. The rest was not paid for at all. Gazprom's export revenues helped offset the costs of these subsidies, in what can best be described as a sort of reverse dumping. Effectively, the underpricing of energy amounted to a large capital transfer financed partly by Gazprom's export revenues, partly by the state budget, which allowed the monopolists to run up substantial tax arrears, and partly by the decapitalisation of the infrastructure monopolies themselves.⁷⁸

This situation changed dramatically after the financial collapse of August 1998. The devaluation and subsequent recovery meant that enterprises' ability to pay (and to pay in cash) improved rapidly after the crisis, while legal changes made it easier for the monopolies to enforce payment and to cut off non-payers. These factors contributed to a dramatic improvement in payment discipline. This improvement was offset in the years immediately following the crisis by the policy of holding down gas and electricity tariffs, which fell dramatically relative to producer prices generally (see Table 3). The overall level of subsidy initially changed little but the mechanisms shifted, as the role of low tariffs increased and that of non-monetary settlements and non-payments fell.⁷⁹

Since 2000, however, gas and electricity tariffs have risen faster than the PPI or the CPI, closing much of the gap that opened up after August 1998. This has not, however, led to a decline in payment discipline, which has, on the contrary, continued to improve. RAO UES, in particular, has been extraordinarily successful in this area (see Table A1.1). It thus appears that the aggregate subsidy provided to the rest of the economy by the energy monopolies, though still significant, has been declining steadily since early

78. The role played by the monopolies in the 1990s is analysed in detail in OECD (2000a:83-112) and OECD (2002:105-54). See also Woodruff (1999) and Tompson (1999). The other great infrastructure monopoly, the Ministry of Railways, appears to have played a similar role, albeit to a lesser degree.

79. For details, see OECD (2002:121-32).

1999, in absolute terms and relative to GDP.⁸⁰ However, assessments of the scale of the implicit subsidy vary widely, reflecting disagreements about the real costs of production in Russia and about the appropriate 'reference' price for assessing any possible subsidy. These issues are considered in the next section.

Table A1.1. **Payments to RAO UES, 2nd quarter 2003**

Branch	Collection rate (%) [*]	Change on Jan-Mar 2002 (%)	Change in the volume of receivables outstanding (%)	
			2 nd Qtr 2003	2 nd Qtr 2002
Industry	103	0	-10	-6
Agriculture	112	-1	-6	-5
Forestry	112	-1	-29	-15
Transport & Communications	102	-2	-42	-46
Construction	109	+2	-22	-11
Municipal utilities	125	+6	-15	-9
Households	108	+5	-12	-4
Other	114	+1	-18	-11

*Figures above 100 reflect the paying off of arrears accumulated in earlier periods.

Source: RAO UES.

Pricing energy on the Russian market

Electricity

Electricity prices for industrial consumers are well below OECD levels (which, it should be noted, vary widely). In 2002, average electricity tariffs for industry amounted to USD 0.021; the corresponding figure for households was just USD 0.015. This compares with average prices in OECD member states in 2002 of around USD 0.048 for industry and USD 0.09 for households.⁸¹ However, while it is clear that Russian electricity tariffs must rise over the long term, they are not obviously too low at present. The planned liberalisation of the electricity sector may indeed lead to lower tariffs in the first instance.⁸² There is considerable excess capacity and competition in the wholesale market could thus push prices down, especially as liberalisation should result in more efficient dispatch and other efficiency improvements. In the longer term, tariffs will rise. The need to bring new generating capacity on-stream should, by the end of the decade, push tariffs to the levels needed to justify entry. In short, Russia is likely to follow the price path of many other liberalised markets, with prices falling at the onset of competition and then rising to the levels needed to make investment in new generating capacity attractive. Changes in natural gas prices are, of course, an important factor in determining the cost structure of Russian electricity producers; a great deal of the gas subsidy is passed through to other sectors via the electricity industry. However, higher gas prices would — in the context of the current power sector restructuring — have less impact than is widely believed. Even simulations/estimations based on gas prices of around USD 40/thousand cubic metres (tcm) point to modest long-term increases in electricity prices.

80. See Pryadilnikov (2003:11).

81. IEA (2003c:I.70-1).

82. See Tompson (2004) for details.

Natural gas

The highest estimates of the gas subsidy are based on comparisons between Russian domestic gas prices and prices in Russia's major export market, the European Union. Russian domestic prices in recent years have been roughly one-quarter of average export prices.⁸³ Lower estimates of the subsidy are based on assessments of the long-run costs of gas production in Russia. This is the more appropriate basis for any estimate. Recent World Bank analyses argue strongly that domestic prices should rise above the long-run marginal cost of producing gas in Russia, which the Bank has estimated at USD 35-40/tcm. Clearly, the prices charged to consumers on the domestic market should at least cover the full costs of supplying them.⁸⁴ As it happens, Russian government policy is based on the belief that domestic tariffs should rise well *above* most estimates of long-run marginal costs. However, they might still remain well below EU levels. There is no reason to expect that gas in Russia should not be substantially cheaper than gas in the EU, not least because so much of the cost of gas to end users is determined by transport costs and taxes.

Using EU prices (or, more accurately, export netback prices, which exclude the additional cost of transport beyond Russia's frontier) as the basis for comparison implies that EU and Russian domestic prices should converge. For Russia, that would mean either selling gas to western consumers much more cheaply than at present or raising domestic prices well above long-run marginal costs. There is no reason why this should occur or why Russia would want it to occur. Russia is not a price-taker on international gas markets as it is on oil markets; instead, it has some market power. Domestic sales are not simply the opportunity cost of export sales foregone, since prices in Europe would fall if Russia were to increase gas exports substantially. Given that Russia's gas resources are the property of the Russian state and that it is technically feasible for Russia to segregate its domestic gas market from that of Europe, there is arguably a case for the sort of price discrimination Gazprom now practices *vis-à-vis* Russian and foreign buyers of its gas, although, as noted above, it would be preferable to find an alternative mechanism for managing Russia's gas exports.

The alternative — liberalisation of exports and the unification of tariffs on the domestic and export markets — would lead to somewhat higher prices for Russian consumers and much lower prices in Europe. In effect, the unification of gas prices would not eliminate the economic rents from Russia's gas wealth but would instead allow a large share of them to be dissipated to gas distribution companies and consumers in the EU. It is hardly in Russia's interest to do this. While it is widely accepted that there is a real need for reform of the Russian gas sector, it is in Russia's national interest to see that these rents, however they may ultimately be allocated, should accrue to the Russian people rather than foreign entities.

Even using estimates of long-run marginal costs as a basis, Russian gas prices would appear to be too low. Gazprom continues to insist that it is selling gas on the domestic market at a loss. Given the nature of current tariff regulation, such claims should not be taken at face value, as the company has a vested interest in arguing that prices are too low. However, most observers tend to agree with Gazprom's claim, although many express doubts about the size of the gap between current tariffs and break-even levels. Estimates as to the 'true' level of cost recovery vary widely. Some observers believe the company exaggerates these in order to lobby for higher tariffs, while others simply argue that the costs reflect Gazprom's own inefficiency⁸⁵. There are also differences in the extent to which the various analyses make allowance for returns on capital installed in Soviet times or the need to invest in the development of new fields.

83. See, *e.g.* Kerkelä (2004) and Nash *et al.* (2002:5-8).

84. See Pryadilnikov (2003); and Tarr and Thomson (2003).

85. See Ahrend (2004b).

If some allowance is made for Gazprom's need to replace fixed assets and/or develop new fields and transport infrastructure, most estimates fall between USD 22 and USD 35/tcm, as compared with the current level of roughly USD 30-31/tcm for industrial consumers and USD 20/tcm for households. The former would imply that Gazprom's domestic sales are already at or slightly above break-even levels. The latter figure, by contrast, is below the USD 36-41 range that the government is committed to reaching by 2005 or 2006. It could well prove to be a sustainable long-term price in a liberalised sector. Somewhat higher is the World Bank figure mentioned above. On the basis of a detailed examination of the costs required for production *and sustainability of production* of natural gas, the Bank estimated the LRMC for gas at USD 35-40/tcm.

At the lower end, Breach and Westman (2002), in a study based on Gazprom's published accounts, come to the following conclusions:

- the average operating and distribution cost without paying for any capital expenditure (capex), taxes etc. (*e.g.* excluding all taxes, transit costs through third countries, and all capex) is around USD 12.7/tcm;
- the average operating and distribution cost that allows replacement of existing capital stock is of the order of USD 18.2/tcm;
- the average operating and distribution cost allowing for additional capex that increases the capital stock is USD 22.7/tcm; and
- the average operating and distribution cost allowing for additional capex that increases the capital stock and domestic royalty taxes is around USD 24.8/tcm.

There are also other estimates from brokerage companies. In 2002, United Financial Group (UFG) published an estimate of USD 41/tcm, which was meant to make allowance for very significant investment in new fields and other fixed assets (*i.e.* not merely covering marginal costs but also replacement of existing assets). Renaissance Capital analyses point to USD 34-35/tcm as a more appropriate level. According to the Institute for Strategic Development of the Energy Industries, the 'grey-market' price (perhaps the best proxy of what the gas price might be in a free internal Russian market) in the first half of 2003 was USD 30-38/tcm, compared to an average regulated tariff of about USD 23-24. UFG estimates that the average free-market price for 2003 was USD 35.60.

As noted above, the effective rate for industry is already higher than the regulated tariff. This is because industrial consumers (including those in the power sector) now buy an increasing share of their gas at prices above the regulated tariffs set by the Federal Energy Commission. Prices, moreover, are to continue rising in both rouble and dollar terms for the rest of the decade. Too fast a rate of increase would not allow Russian industry sufficient time to adapt to higher energy prices. An overly rapid adjustment would raise the risk of a fall in payment discipline, as it did in the 1990s, when industry was unable to cope with much higher tariff levels than it now faces.⁸⁶ However, the renewed accumulation of payment arrears to gas suppliers would constitute a *de facto* reduction in effective tariffs — even if formal tariffs were much higher.

86. See OECD (2002:121-32 and 2000a:83-112) for details on the relationship between high nominal energy tariffs, payment discipline and the growth of non-monetary exchange in the 1990s.

Do Russia's lower energy prices constitute an unfair subsidy to industry?

Russia's practices with respect to the domestic gas market are widely reckoned to be undesirable and unsustainable over the long term, a view with which the Russian government concurs. While many aspects of gas market reform remain highly contentious, there has been general agreement for several years now on the need to raise domestic gas tariffs. However, current policies and practices do not appear to be incompatible with WTO rules. In any case, there are already enormous differences in the gas prices paid by industrial users in different WTO member states. If one excludes developing countries (where gas is often very much cheaper), there is still a roughly five-fold difference between the cheapest and most expensive WTO members. There are significant differences within the EU itself: in 2000, the highest industrial tariffs in EU member states varied between USD 107.05/tcm in the United Kingdom and USD 216.11 in Greece, while household gas tariffs ranged between USD 159.50/tcm in Finland and USD 735.29 in neighbouring Denmark.⁸⁷

The relevant provisions (if any WTO rules at all apply in this area) would appear to be the following:

- *Article XVII (1) of the GATT (1994)* on state trading entities requires that state-owned entities engaged in foreign trade should make purchase and sales decisions on a commercial basis.
 - The article refers to 'purchases or sales involving either imports or exports'. The EU's complaint is with the regulation of the domestic market.
 - Gazprom behaves in a commercially rational manner, given the regulatory constraints imposed on it: it seeks to limit deliveries at regulated prices and to maximise exports and/or those domestic deliveries that it is allowed to make at higher prices. Gazprom's domestic sales would appear to be approaching, if not already above, the break-even point, so a charge of 'reverse dumping' is hard to sustain.
 - As long as Gazprom maintains its current monopoly position, it is economically rational for the authorities to regulate tariffs and for Gazprom to seek to discriminate among customers where it can, as any monopolist will try to do. None of this is WTO-incompatible. De-monopolisation of the Russian gas sector might well be desirable but it is not an issue addressed by WTO rules.
- *The Agreement on Subsidies and Countervailing Measures*. This is a rather more complex document, but the crucial point is that a subsidy is prohibited if it is linked to trade via either the requirement that domestically sourced inputs be used or the requirement that the resulting output be exported (Article 3.1). Even if low energy prices are understood to be a subsidy, they do not constitute a *prohibited* subsidy.
- *Article VI of the GATT (1994)*. This sets out anti-dumping rules and contains an exhaustive definition of dumping. The basic definition (elaborated in subsequent paragraphs) is as follows:

For the purpose of this Agreement, a product is to be considered as being dumped, *i.e.* introduced into the commerce of another country at less than its normal value, if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country.

87. IEA (2003a, III.31-33).

It is clear from this that low domestic energy prices, which affect all producers and which thus reduce the price of *both* exported *and* domestically consumed goods, could not form the basis for a claim of dumping.

ANNEX 2. SURVEY OF GAS PURCHASING AND PRICES

As noted above, there are no comprehensive data covering the effective price of gas for Russian industrial consumers. As an increasing proportion of gas is being purchased at prices well above regulated tariffs, this represents a serious lacuna in our understanding of the domestic gas market. In order to arrive at an estimate of the effective price of gas for Russian consumers, the OECD surveyed 744 Russian industrial enterprises about their gas supply arrangements. The survey was conducted in November 2003 as part of the monthly enterprise survey of the Institute for the Economy in Transition (IET). The questions are presented in Box A2.1 below.

Of the 744 enterprises surveyed, 74 (just under 10 per cent) failed to respond to the questions on gas consumption. A further 280 replied that they do not purchase any natural gas. The estimates presented above are based on responses from the remaining 390. This sample includes enterprises from 61 of Russia's 89 regions. Their sectoral and size profiles are shown in Tables A2.1 and A2.2.

Table A2.1. **Sectoral profile of the survey sample**

Industrial sector	%
Fuel	0.5
Ferrous metallurgy	2.4
Non-ferrous metallurgy	3.4
Chemicals and petrochemicals	5.1
Machine-building	46.0
Forestry, pulp and paper	4.8
Construction materials	8.5
Glass, porcelain and china	1.7
Light industry ⁺	10.2
Food industry	13.1
Electricity*	1.7
Other	2.7

+ The official definition of 'light industry' in Russia is narrower than in most OECD members, covering only textiles, furs and leather goods.

* Electricity sector enterprises were excluded from the calculations based on the survey data (see below).

Source: IET, OECD.

Table A2.2. **Survey sample by enterprise size**

Number of employees	%
Under 500	30.0
501-2000	45.3
2000+	24.2
Not specified	0.5

Source: IET, OECD.

It should be noted that the IET panel was constructed to provide a representative cross-section of medium- and large-scale Russian industry. In other words, it reflects the structure of industrial production rather than the structure of gas consumption. This should be borne in mind when viewing the structure of the sample by consumption levels as shown in Table A2.3.

Table A2.3. **Survey sample by scale of consumption**

Million cubic meters, mcm

Annual gas consumption	% of sample
Under 1 mcm	23.8
1-10mcm	47.7
10-100mcm	25.4
100-1,000mcm	2.3
Over 1,000mcm	0.8

Source: IET, OECD.

A panel constructed solely on the basis of gas consumption would leave out some industrial sectors entirely (as they do not consume natural gas directly and are affected by gas prices only via the prices of electricity and other inputs produced with gas) and would have given much greater representation to the power sector, which accounts for 11.9 per cent of industrial production⁸⁸ but around 40 per cent of gas consumption. The importance of the power sector in understanding gas allocation and pricing was such that the power sector enterprises in the sample were excluded from the calculations. Instead of survey data, the figures for power-sector consumption and pricing are based on data provided directly by RAO UES on actual gas supplies both to 'federal' power stations (*i.e.* those controlled directly by UES) and to UES's daughter energos. The UES data, moreover, are consistent with the figures provided by power-sector enterprises in response to the survey, which suggests that the survey results overall do indeed reflect the actual situation with respect to gas supply to Russian industry.

Some 61 per cent of the enterprises responding to the questions on gas consumption reported that they received 100 per cent of their gas from Gazprom at prices set by the Federal Energy Commission (FEC); 39 per cent reported paying above-FEC prices for at least some of their gas. On average, consumers in this latter group (outside the power sector) reported buying 11.5 per cent of their gas at above-FEC prices, at an average mark-up of 37 per cent. Some 90 per cent of those buying part of their gas at higher prices nevertheless reported buying *all* of their gas from Gazprom. Only 7.3 per cent reported purchasing gas directly from independent producers. This is a small portion of the total sample but is very close to the share of respondents who reported that they were able to purchase directly from other producers (8.7 per

88. Goskomstat weights; see Ahrend (2004a), Box 1., for a detailed discussion on the size of different sectors in the Russian economy.

cent). This suggests that the vast majority of industrial consumers are either unable to deal directly with non-Gazprom producers or are at least unaware of the possibility of so doing.

The situation in the power sector illustrates the striking divergences that exist under the current system of gas allocation. According to RAO UES, the 'federal' power stations paid FEC prices for 98.0 per cent of their natural gas in 2003, down slightly on 99.2 per cent in 2002. By contrast, only 71 per cent of the natural gas supplied to the regional energos in 2003 was at FEC tariffs (72 per cent in 2002). In both cases, the average mark-up to FEC for 'above-quota' gas was 30 per cent. In this context, it is important to note that the energos account for 87.6 per cent of gas consumption in the UES system. Thus, it would appear that UES plants in 2003 bought 25.6 per cent of their natural gas at prices averaging 30 per cent above FEC tariffs, making for an effective price for power-sector consumers of 7.7 per cent above FEC.

Box A2.1. Questions on gas consumption and pricing

1. What will be the volume of gas consumption by your enterprise in 2003 (approximately)?

___ 1000 cubic metres.

2. What percentage of your natural gas consumption is satisfied by so-called 'quota gas', for which bids are submitted to Gazprom and which Gazprom sells at regulated tariffs? (If your consumption is 100 per cent covered by quota gas, then you need not answer any further questions.)

3. What percentage of your gas consumption was covered by gas supplied by Gazprom at regulated tariffs in 1999?

4. If one takes 100 per cent as the tariff for quota gas, what price does your enterprise pay for above-quota gas?

___ per cent

5. Do you have a real opportunity to buy gas directly from producers who are independent of Gazprom?

___ Yes

___ No

6. Does your enterprise buy its 'above-quota' gas from Gazprom or its structures, or directly from a producer who is independent of Gazprom?

___ We buy from an independent producer.

___ We deal only with Gazprom and its structures.

7. What factors influence your choice of a supplier for 'above-quota' gas?

___ There is really no choice.

___ Mainly price.

___ The opportunity of concluding long-term contracts and the guarantee that the supplier will honour them.

___ Gazprom's negative attitude towards attempts to deal directly with other suppliers.

___ The recommendations of regional and municipal authorities.

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