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**THE SUSTAINABILITY OF RUSSIA'S ENERGY POWER:
IMPLICATIONS FOR THE RUSSIAN ECONOMY**

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Economics Working Paper No. 84

December 2007

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THE SUSTAINABILITY OF RUSSIA'S ENERGY POWER: IMPLICATIONS FOR THE RUSSIAN ECONOMY

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Abstract

To what extent and through what mechanisms has Russian economic growth since 1998 been dependent on Russia's oil and gas industries? Is the likely development of these industries up to 2020 capable of maintaining or increasing Russia's role as an energy supplier? What are the consequences for the rest of the Russian economy – that is, all production except oil and gas – of the leading role played by the hydrocarbons sector now and (probably) in the next decade or so?

I shall try in this paper to answer three questions.

To what extent and through what mechanisms has Russian economic growth since 1998 been dependent on Russia's oil and gas industries?

Is the likely development of these industries up to 2020 capable of maintaining or increasing Russia's role as an energy supplier?

What are the consequences for the rest of the Russian economy – that is, all production except oil and gas – of the leading role played by the hydrocarbons sector now and (probably) in the next decade or so?

The first of these questions is comparatively straightforward. The other two are not. They cannot be answered conclusively, because alternative developments are possible. The best that can be done is to provide assessments and scenarios that may perhaps achieve two things: they can rule out some future developments that are extremely unlikely or internally contradictory, and they can identify indicators for future assessment: if in 2010 (say) we observe X, then we're on projected path Y, not the alternative path Z. What one can't expect to discover is the one and only possible set of future developments.

The paper consists of a brief background on recent Russian economic development in international perspective, followed by three sections corresponding to the three questions just listed, and some conclusions.

Background: Russia since 1998 in international perspective

Russia is now, in World Bank terminology, an upper-middle-income country. Its per capita gross national income is still far below those of the richest countries, but it is at the same time a multiple of those of the truly poor countries. That middle-income category is one in which one would normally expect to see rapid, catch-up growth over the very long term: on average, that is, over twenty or more years. Middle-income countries have the potential to absorb new technology from more advanced countries and largely by that means to reduce the gap between themselves and the rich world. This potential is all the greater if, like Russia, they have reasonably good education systems.

Chart 1 puts Russia in perspective in this sense, placing its per capita gross national income (GNI), measured at purchasing power parity, alongside those of a number of other countries, all measured as a percentage of the US figure.

CHART 1 ABOUT HERE

On this assessment, Russia's development level is above that of Brazil, China, India or Turkey and roughly on a par with Mexico and South Africa. At the same time, Russia now lags well behind Estonia, though the latter was only a little ahead of the Russian Federation when both were parts of the USSR.

Middle-income countries may have the potential for rapid long-term growth, but by no means all achieve it. So far, Russia looks to be doing rather well. In comparison

with a selection of other middle-income countries, Russia was growing fast in the first half of the present decade. Indeed it has grown fast over the whole period 1998-2007. Chart 2 presents some comparative medium-term growth figures.

CHART 2 ABOUT HERE

Recently, then, Russia has been progressing substantially faster than Mexico or South Africa, at a rate not so very different from India or Turkey but decidedly less fast than China. However, Russia had one significant initial advantage over these other countries: it has been recovering from a prolonged fall in output (1989-1998, with a brief remission in 1997). Its nine most recent years of strong growth therefore contain a recovery component. The size and duration of this recovery effect cannot be reliably gauged. Still, the fact of its existence suggests that some slowdown is likely in future unless other sources of growth become stronger.

The Russian economic recovery was triggered by an enforced devaluation of the rouble in 1998 and then picked up by a strong rise in oil prices. Most analysts agree that, at least by some point in 2006, two recovery elements have been fully used up. Usable spare capacity was down to something like a normal level, and the real effective exchange rate (the rouble's exchange rate against a trade-weighted basket of currencies, adjusted for inflation in all the countries concerned) was at least back to its level before the August 1998 financial crisis.

One impressive feature of Russian economic performance since 1998 has been the restraint shown in macro-economic management. The Russian monetary authorities have only the most limited instruments for managing interest rates, credit and exchange rates, and most of the burden has fallen on budgetary policy. This, under Aleksei Kudrin, the finance minister, has been directed above all at controlling spending so as to maintain a budgetary surplus, and at sterilising the inflow of petrodollars, principally (from 2003) by channelling a large portion into the stabilisation fund. Some of that inflow has been used, *via* the stabilisation fund, to reduce the state's foreign debt, which in mid-2007 was below 5% of GDP.

Thanks to this macro-economic prudence on the part of Russia's policy-makers, the inflation rate has been slowly brought down. This has been achieved despite the country experiencing very rapidly rising export revenues. There has however been another benign influence helping to contain inflation: the strong rise in the demand for money, which has come close to matching the rise in money supply. That reflects the buoyancy of the Russian real economy and the growing strength of the rouble. Rapid real economic growth has increased the demand for money; at the same time, growing confidence in the currency has led to increased readiness to hold roubles, reducing the velocity of circulation of money and leading to roubles replacing dollars in domestic stocks of money.

Overall, the Russian economy has performed above expectations – including those of the Russian government – for close to a decade. Not only has growth been strong and inflation contained, but economic benefits have trickled down more than is often suggested. Yes, Russia has become a highly unequal society, but the number of people below the poverty line has been greatly reduced, and so has unemployment.

Clearly, the growth has been oil-driven, but that does not make that growth any less real; nor does it necessarily imply that rapid growth in Russia is not sustainable.

*Energy dependence*¹

Oil and gas exports have not been driving Russian growth directly. That is to say that the rise in value added, in real terms, in these sectors has not been a major component of the increase in real GDP. That is hardly surprising. Output of gas has been almost stagnant; oil production growth was fast in 1999-2004 but has since slowed; and the oil and gas industries employ fewer people than the Russian railways: less than 2 percent of the employed workforce. What has driven growth is the rise in revenues of these industries, chiefly derived from their sales to Europe at rapidly rising prices. Those revenues feed the state budget (some but not all of this financial inflow being withdrawn from circulation in the stabilisation fund), personal incomes and company profits.

The importance of exports in all this can be illustrated in the case of gas. In 2006 24 percent of gas output was exported outside the CIS, almost all of it to Europe, yet non-CIS-export receipts were more than half of Gazprom's revenue.² The Russian GDP, exports and federal budget depend heavily on oil and gas production, as Chart 3 illustrates.

CHART 3 ABOUT HERE

It is mainly through their effect on incomes and spending that oil and gas prices affect the levels of Russian overall economic activity. The demands for inputs into oil and gas production also play a part but apparently a modest part, since much equipment is imported. Input-output analysis shows that other input demands from the hydrocarbons sector tend to be on Russian services rather than Russian goods production (Nakamura 2006). At all events, the overall effect of a change in the oil price, acting mainly through incomes and spending, is substantial. The Institute for Economies in Transition of the Bank of Finland (BOFIT) estimates that a sustained \$10 rise in the oil price boosts Russian GDP by about 2% (Ollus 2007).

This effect does not come solely from crude oil exports. The crude oil price affects the prices of oil products, and the pricing formulae for natural gas in the long-term supply contracts on which Gazprom operates are in turn based on oil-product prices. So hydrocarbons revenue as a whole is geared to the oil price, albeit with varying lags for different parts of that revenue. About two-thirds of oil export revenue, at mid-2007 prices and under 2007 rules, goes into the government's stabilisation fund (*stabfond*); that leaves a substantial part of hydrocarbons export revenue not being sterilised through the stabilisation fund: about three-fifths in all in first-half 2007.³ Some of that non-sterilised revenue, mainly from oil products and gas, was taxed; but if it did not go into the *stabfond*, it was tax revenue that could feed government spending.

¹ The first part of this section of the paper overlaps with a section of Hanson 2007.

² Output data from Rosstat; export volumes from Russian Customs data (www.customs.ru); revenue share quoted from Gazprom sources in *Vedomosti*, 26 June 2007.

³ Author's calculation from Central Bank of Russia estimates of the balance of payments (www.cbr.ru/statistics/credit_statistics/print.asp?file=bal_of_payments_est.htm, accessed 15 August 2007).

From the beginning of 2008 the treatment of hydrocarbons export revenue was to be changed. The tax base for what had been the *stabfond* was extended from the mineral extraction tax and export duties on crude oil only to cover oil products and gas as well. The *stabfond* itself was to be replaced by three funds: a reserve fund, invested in low-risk foreign-government securities; a fund for future generations invested in higher-yield assets such as foreign equities; and an explicit 'oil and gas subsidy' to the federal budget. The reserve fund was to be at least 10% of GDP. The oil and gas subsidy was to be set for three years at a time in the rolling three-year budget process that started in 2007 – and the government aimed to limit that subsidy in the course of the budget process. But there is no binding rule on the division between the fund for future generations and the budget subsidy.

This new arrangement could alter the linkage between changes in the world oil price and the domestic Russian economy. If the oil price rises at a time when the reserve fund is at or above its 10%-of-GDP mark, the additional revenue is no longer automatically sterilised. Political pressure to transfer more to the budget at the expense of the fund for future generations may be hard to resist. That would increase the sensitivity of Russian GDP or inflation or both to the oil price.

In autumn 2007 one other change was looming on the foreign-currency-inflow front. Imports were rising faster than exports, not only in volume terms but in aggregate value, lowering the surplus in the current account of the balance of payments. The Russian Ministry of Economic Development and Trade (MERT) offered three alternative growth scenarios to the year 2020, in two of which the trade surplus disappeared or went negative (*Vedomosti* 13 June 2007). Other projections converge on a trade surplus (and therefore a current account surplus) that disappears by 2012. That was already the direction of change in 2007. Thus the inflow of funds through the current account of the balance of payments was expected to decline, if not disappear altogether, in the medium term. So much the better, so far as inflation control is concerned.

However, the net private-sector flow of capital – a net outflow through 2004 – has recently turned into a net inflow, with signs of further growth to come. That could mean that Russia continues to receive a net inflow of currency overall. The difference would be that this new, capital-account inflow would not be sterilised by a device comparable to the *stabfond*, which operates specifically on oil revenue. Inflation might be imported through a different, and less controlled channel.

What of the performance of the Russian non-energy economy? Diversification of the economy remains an objective of Russian policy, even at a time when complacency about the country's 'energy power' rules. There has indeed been some diversification – a good deal of it done at the grass-roots level by firms, not the state.

Industry as a whole, including oil, gas, metals and other extractive industries, accounts for around two-fifths of GDP when oil and gas distribution are classified as part of industry (Tabata 2006). About half of this total is manufacturing, and manufacturing growth since 1998 has been slightly below overall GDP growth – in other words, quite robust. However, very little of Russian industry produces for export. Oil, gas and metals have accounted recently for around 80% of merchandise

exports. So far as tradable goods are concerned, Russian manufacturers engage mainly in making import substitutes. Typically, they slot in to lower-quality segments of the market for their product-range, avoiding head-on competition with imports.

The service sector, including financial services, has been booming. A large part of services output is not tradable. That means that import competition is not a problem.

In both manufacturing and services, however, domestic competition can be provided by foreign firms entering the Russian market. That has been happening on a substantial scale recently. The fact that foreign firms now play major roles in Russian banking (about 20% of assets)⁴, real estate (including retail development), retailing, brewing, confectionery and car assembly, gives some indication of lines of business that are dynamic and attractive – even if the indigenous Russian firms in those industries are, for the most part, not capable of competing abroad. This roster of industries that are both attractive and open to foreign direct investment is extending to construction as the state begins to develop a major infrastructure programme involving public-private partnerships (Buckley 2007).

Another clue to which branches of the economy are developing strongly is the launching of initial public offerings (IPOs) of shares on Western stock-markets. In the first nine months of 2007 at least 16 Russian IPOs and three secondary public offerings (SPOs) were arranged in the West, mainly on the London Stock Exchange. In total they raised over \$26 billion dollars. Of the 19 offerings, five were by retail and consumer-goods businesses, four by banks and three by real estate firms. By far the largest amount of money raised was by banks, with a total of \$17.6 bn.⁵

In fact, the bulk of the money raised in this way by banks was raised by state-controlled (i.e., majority-state-owned) banks. This indicates one rather unusual feature of current Russian development: the state is trying to be an active developer of businesses in whatever the Kremlin classifies as ‘strategic’ activities. Officially, ‘strategic’ lines of production are the 39 (mostly defence-related) listed in legislation that is pending on the subject, plus fossil-fuel and mineral deposits above certain sizes that will be specified in a long-delayed revision of the subsoil law. Less officially, Russian policy-makers seek to ensure state dominance in several other industries, including banking.⁶

Few analysts expect this leading role for the state to be very healthy for the economy. But at least the approach is pragmatic. The policy-makers, aware that they need foreign technology and finance, allow for and encourage Western participation even in ‘strategic’ sectors, provided it is not accompanied by control. Thus Boeing has a joint venture with titanium producer VSMPO-Avisma, and Italy’s Finmeccanica has 25% of the plane-maker, Sukhoi.

⁴ Derived from Central Bank of Russia, *Byulleten’ bankovskoi statistiki*, 2007 no. 6.

⁵ Derived from *Deutsche UFG Economics*, 28 September 2007, p. 10, and *Financial Times*, 28 September 2007.

⁶ State-controlled banks probably at present account for somewhat over half of all bank assets. The Russian government, in its November 2006 bilateral deal with the US on the terms of Russian accession to the World Trade Organization, secured a compromise under which Russia reserved the right to block further foreign acquisition of banks in Russia if the foreign asset-share ever exceeded 50% (Johnson 2007).

One large non-energy sector, mining and metals, is unquestionably strong. Aluminium, steel and nickel firms, with strong market power inside Russia and export capabilities, have been turning themselves into international companies. Oleg Deripaska's UC Rusal is at the time of writing the world's largest aluminium producer, with smelters and other plants on several continents. Severstal and other leading steel producers have been buying foreign companies, including in the US, and are also becoming global businesses. The only hydrocarbons-based companies with much international reach beyond the CIS are Gazprom and Lukoil. Gazprom has invested in downstream distribution assets in Europe. Lukoil has bought into oil-products distribution in both Europe and the US.

Some of these leading firms have also been moving into new industries in Russia and thus diversifying by becoming conglomerates. Deripaska, again, is building a stake in car-making (*Vedomosti* 29 September 2007); Mordashov, the main owner of Severstal, has gained control of the leading generating-equipment producer, Silovye mashiny (*Vedomosti*, 13 September 2007). And so on. Of course, acquiring an existing company does not create new capacity and therefore does not by itself alter the structure of the economy. However, these acquisitions are one means by which investment funds get channelled from one industry to another. And they are associated with plans to expand the target business.

It can be useful to look at a national economy as the sum of the economic activity that is conducted within its borders *plus* the economic activity in other countries of companies controlled by firms based within the nation in question.⁷ In this sense, Russian business is expanding – mainly, it has to be said, in the metals sector – even faster than Russian GDP indicates. And this outward foreign direct investment often incorporates more advanced processing – notably in the steel industry – so that a Russian company can be moving up the value-added chain even if it is doing so outside Russia's borders.

The Russian state, under Putin's leadership, has been pursuing diversification in a quite different fashion. This is through state-controlled development of industries that are relics of the old Soviet military-industrial sector. One of these, the nuclear industry, will be discussed in the next section, as it is a component of the energy sector itself. The others are aerospace, shipbuilding, weapons production and nanotechnology. In each of these a state-controlled holding company has been created which will group together the enterprises of the sector, while leaving at least some of those enterprises partly privately-owned and open (at the discretion of Russian policy-makers) to alliances with foreign firms. These alliances could take the form of joint ventures (separate from the Russian parent company, such as Boeing has with the titanium producer VSMPO-Avisma) or minority foreign stake-holdings, such as Finnmeccanica has in Sukhoi. This approach is meant to encourage the inflow of foreign technology and capital without surrendering control.

⁷ From one point of view, this entails double counting. One is not netting out the activity within the nation in question of foreign-owned firms. But the resilience and command over resources of the nation's companies depends in part on what they do abroad, while some of its factor income also comes from foreign firms operating within its borders.

In short, the Russian economy amounts to a great deal more than a petro-state. In the concluding section of this chapter I shall consider the growth potential of the non-energy economy. Meanwhile, we return to the energy sector, to consider its prospects and, in particular, its future capacity to meet Europe's rising demand for oil and gas.

Russia's future energy export capacity

Much Western discussion of Russian energy supply has focussed on the reliability of Russian oil and gas supplies to Europe, and on Moscow's possible use of energy supply for foreign-policy ends. My aim in this section of the paper is to put the European concerns in the context of broader Russian policies. Russian energy policy is about Russia's domestic production and consumption of energy as well as about exports. It may help us to understand our 'energy security' concerns better if we consider Russia's as well.

The brisk and selective overview of Russia's energy policies that follows is based mainly on the 2003 Energy Strategy.⁸ It should be borne in mind that a lot has happened in the Russian energy sector since August 2003, when that document was finalised. The state has acquired by administrative pressure, by selective use of the courts and by purchase (usually with money borrowed from foreign banks) control over the assets of several private energy-sector firms: Yukos, Sibneft, a Shell-Mitsui-Mitsubishi consortium, and TNK-BP assets. In October 2007 it was not yet clear whether the medium-sized private oil company Russneft would be acquired by the state or by the aluminium magnate Oleg Deripaska. There have been disruptions to Russian gas supplies to Europe through Ukraine in January 2006 and to Russian oil supplies to Europe through Belarus in January 2007, and to Germany in July 2007. But in autumn 2007 the 2003 Energy Strategy was still prominently displayed on the Minpromenergo website; more to the point, investment and several other policies appeared still to be based on it.

The official energy strategy, in short, provides a picture of official Russian expectations about the sector and of at least some of the policies to be pursued towards it.

The *Strategy* does not envisage rapid growth of primary fuel output.⁹ From the numbers given in Chart 3 of the *Strategy*, one can derive the following projected growth rates per annum between 2000 and 2020 in primary fuel production and usage in physical terms: production 1.8%; Russian consumption 1.7%; resources available for export 2.0%. This is in the optimistic (high growth, relatively high world oil prices) variant.

This should be seen against the background of the slowdown that has already taken place in the volume of oil exports, as illustrated in Chart 4. Largely because of state

⁸ *Energeticheskaya strategiya Rossii na period do 2020 goda*, approved by the Russian government on 28 August 2003, and to be found at www.minprom.gov.ru/docs/strateg/1. Henceforth '*Strategy*'.

⁹ Here and subsequently, 'primary fuel' means oil + gas + coal + nuclear + hydro. It excludes biofuels, peat, solar, and wind and wave power – on which the strategy has rather little to say. The Russian practice is to sum these in units of *uslovnnoe toplivo*. I use here the tons of oil equivalent measure (toe) that is more familiar in the West. This difference of unit does not affect shares of different fuels in the energy balance or growth rates of production or usage.

policy – limited export pipeline capacity (which is state-controlled), increased taxation and the re-nationalization of a large chunk of the industry – an export growth that had been dynamic has turned sluggish.

CHART 4 ABOUT HERE

The *Strategy* envisages electricity output rising faster than primary fuel output as a whole, with electricity generation becoming less dependent on gas and more dependent on coal, nuclear and hydro. It also envisages energy usage per unit of GDP continuing to fall; compare the ‘optimistic’ variant for energy consumption growth above with the GDP growth assumption in the same variant: 6.2% p.a.

This is not, on the face of it, unreasonable. Between 1998 and 2005 primary energy consumption rose at an average rate of 1.5% p.a., while GDP rose at an average annual rate of 6.7%. (Derived from BP 2006, and Troika Dialog, *Russia Economic Monthly*, March 2007). Moreover, Russian energy usage per unit of GDP is still high by international standards, as Table 1 shows. Canada is singled out for comparison on grounds of climatic similarity.

Table 1. Total domestic energy supply per unit of GDP in 2005: selected countries (tons of oil equivalent per \$1,000 of GDP in 2000 ppp dollars)

Russia	0.47	Canada	0.27
OECD	0.18	World	0.21

Source: IEA 2007, pp. 48-57.

It may however be more difficult in future to keep up the recent rate of improvement in energy usage. Much of the sectoral change in the economy towards less energy-intensive activities, like services, has already happened; output growth by increased usage of previously spare capacity has probably reached its limits; and the working-age population is now starting to decline, increasing the pressure to substitute capital and energy for labour. Therefore, given output growth, domestic energy usage may be higher than projected.

At the same time, the low projected rates of oil and gas output growth are striking. Table 2 shows the figures for 2005 actual and the 2010 and 2020 projections in the *Strategy*. The ranges given for the latter two years are for the ‘moderate’ and the ‘optimistic’ variants of the projections.

Table 2. Russian primary energy output, 2005, 2010 and 2020, by energy source (mn tons of oil equivalent p.a. and % growth rates)

2005 actual	2010	2020	% p.a. 2005-2020 ^a
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Oil	470	445-490	450-520	0.7
Gas	538	533-559	571-613	0.9
Coal	137	139-148	161-193	2.3
Nuclear	34	41- 45	52- 68	4.7
Hydro	40	39- 41	44- 48	1.2
Total	1219	1197-1283	1278-1442	1.1

Note: a. Growth rates to top of 2020 range.

Sources: Actual from BP 2006; 2010 and 2020 projections from *Strategy*, converted to mn toe by coefficients derived from the 2000 consumption actuals given in *Strategy* in bcm for gas, tons for coal, bn kWh for nuclear and hydro and the *BP Statistical Review* mn toe data for consumption in that year.

Obviously, part of the story behind the implied oil output growth rate between 2005 and 2020 in Table 2 is that actual growth from 2000 to 2005 was faster than projected in the *Strategy*. (Planned growth from 2000 to 2020 for gas was only 1.1% p.a., so this was not an issue for the gas projections.) It does not necessarily follow, however, that projections for 2010 and beyond should be correspondingly upgraded, simply because 2000-2005 growth was above expectations. Notoriously, Russian oil output growth has slowed dramatically after 2004, as state control of the industry has increased.¹⁰

Some other authoritative projections are even more pessimistic than the Russian government's. The International Energy Agency (IEA) in mid-2007 judged that Russian oil output would probably stop rising in 2010. The IEA baseline scenario rests on a 3% p.a. fall in output from existing fields in 2007-2010, with some offsetting development of new fields: Sakhalin 1, Sakhalin 2 and Lukoil's Timan-Pechora. The IEA puts Russian crude oil output at 10.6 mn barrels a day (b/d) in 2010, and at 10.5 mn b/d in 2012. What happens after 2012 will depend on the rate at which East Siberian fields are developed (see *Vedomosti* 10 July 2007 for a discussion of these projections by Russian analysts).

A slowdown in Russian hydrocarbons output, or an outright fall, would not be surprising. In 1998-2004 Yukos, Sibneft and TNK (the last of these forming a joint venture with BP in 2003) rapidly increased crude oil production by improving management and technology at existing fields, in part by using the skills of Western oilfield services companies like Schlumberger. What they and most other oil companies did not do was to invest heavily in exploration and development of new fields.¹¹ As established fields peak and decline, output growth is expected to slow. For the gas industry there are even unofficial projections of falling output by 2010 unless major new fields in Yamal are developed more quickly than many expect. At present some 70% of Russian electricity is generated from gas, accounting for a substantial part of the 68% or so of Russian gas production that is consumed

¹⁰ On the rise of Rosneft, the state-controlled national champion in the oil industry, see Poussenkova 2007.

¹¹ My guess is that this reflected their lack of confidence (well-founded, it turned out) in their property rights in the longer term. Lukoil – private but much better connected politically – did do more development of new fields. See Gorst 2007: the author notes (p. 3) reports that the Lukoil boss, Vagit Alekperov, spends 80% of his working time monitoring developments in the Kremlin.

domestically. The planned shift to coal and nuclear in fuelling power stations is one of the ways in which Russian policy-makers hope to cope with sluggish gas production.

The plans for nuclear power are therefore an important part of the strategy. They contribute (in the plan) to an outcome in which electricity generation outpaces hydrocarbons output growth. There are at present 31 reactors at ten power stations, with an installed capacity of 23.2 GW. Of these, 15 are pressurised water reactors (PWRs), 15 are ‘channel-type’ [Chernobyl-type] and one is a fast breeder reactor.¹² In his 26 April 2007 address to the Russian parliament¹³ President Putin referred to a programme under which 26 nuclear reactors were to be built in 12 years. This is in line with the *Strategy*, according to which nuclear generation is to increase from 131 kWh in 2000 to 230-300 bn kWh in 2020, raising the nuclear share of electricity output from about 16% in 2003 to 23% in 2020, with European Russia in 2020 having almost a third of its electricity (32%) coming from nuclear power.¹⁴ That is a very ambitious programme indeed.

It may well be over-ambitious. Independent estimates for each of the seven electricity-system regions of Russia show the nuclear percentage share of electricity generation falling between 2008 and 2011: from 25 to 22 in the Centre; 33 to 28 in the North-West; 6 to 5 in the South; 2 to 1 in the Urals and 14 to 13 in the Middle Volga; no estimates for Siberian and the (Russian) Far East are given (Brokerkreditserviz estimates cited in *Vedomosti*, 5 September 2007). It is true that declines between 2008 and 2011 are not, as a matter of logic, incompatible with increases between 2003 and 2020. It is unlikely, however, that, given the time needed to build and start up nuclear power stations, the two projections are compatible in practice.

The new atomic power stations are to be PWRs – basically the same system as that mainly used in the West – rather than Channel-type. The *Strategy* makes it clear that the Russian nuclear industry is to aim at being technologically and commercially competitive internationally. Recent announcements about the state holding company Atomenergoprom (to come into existence in 2008) indicate that it will span fuel and plant production as well as exports and will cover the civilian nuclear programme (*Vedomosti*, 28 April 2007). Whether it can deliver on time and safely the doubling of Russian nuclear capacity called for in the *Strategy* must be open to doubt.¹⁵ What are the implications for Russian oil and gas exports?

We have already seen the volume growth of Russian oil exports slow dramatically, as Chart 4 illustrates.

¹² www.minatom.ru/News/Main/view?id=44653&idChannel=681, accessed 22.v.07; the snide reference to Chernobyl is by me; to be fair, the RBMK-1000 channel-type reactors have been retrofitted with stronger safety controls.

¹³ www.kremlin.ru/appears/2007/04/26/1156_type63372type82634_125401.shtml, accessed 23.v.07.

¹⁴ These %% are from the text of the *Strategy*. The numbers given in Chart 13 of the document show a range of % shares.

¹⁵ Atomenergoprom will report to Rosatom, the state body with overall responsibility for both civil and military nuclear programmes. That body, in its turn, is also to be converted into a corporation (Oxford Analytica Daily Brief, 5 October 2007). These reorganizations may well make sense in the long run, but they will probably complicate the running of the nuclear programme in the shorter term.

We also know that these oil and gas exports matter enormously to the Russian economy – see Chart 3. The share of the hydrocarbons sector in GDP and budget shown in Chart 3 stems primarily from oil and gas exports because of the low prices for output delivered to the home market. And those exports are overwhelmingly to Europe. This suggests that Russia is unlikely to seek deliberately to curtail oil or gas exports for foreign-policy reasons, short of an acute crisis in relations. The greater problem for Europe, almost certainly, is Russia's future capacity to deliver more.

In 2006 44% of Russian oil production and about a quarter of gas production went to non-CIS countries.¹⁶ Russian policy-makers have the following options for maintaining and increasing hydrocarbons exports to non-CIS countries, so long as output growth remains slow.

- Further reduce the already-small deliveries to CIS countries.
- Obtain more gas (particularly) from Central Asia for delivery to Europe.
- Squeeze domestic hydrocarbons consumption by raising domestic prices.
- Squeeze domestic hydrocarbons consumption by substituting coal, nuclear, hydro and alternative energy sources for oil and gas in electricity generation.
- Increase domestic energy-efficiency by means other than raising domestic energy prices.

The *Strategy* has most to say on the last two options. Gazprom's part in implementing them in practice looks unhelpful. For a start, it seeks control of a number of electricity generating companies in the course of the divestment of generating capacity by the state electricity monopoly, UES. The reform of the electricity industry was meant to introduce private capital and competition into generation, not absorption by a state-controlled gas monopolist – perhaps controlling 30% of electricity generation (*Vedomosti*, 12 March 2007). That is unlikely to assist in raising energy efficiency in generation.

Gazprom also seeks control – in the form of a 50% + 1 share stake in a joint venture – of SUEK, the leading coal producer (which also owns some power stations). The Federal Anti-monopoly Service opposes this, but is not expected to be able to defeat Gazprom. Western banks are happy to lend to Gazprom, and it could probably contribute substantially to financing the development of the coal industry, and thus facilitating the substitution of coal for gas in power stations. On the other hand, managing this development by direct Gazprom control may not be too promising. The Ministry of Economic Development and Trade, as well as the Federal Anti-monopoly Service, has expressed concern about the project (*ibid.*).

Gazprom's own gas production (it accounts for around 90% of the Russian total) is approximately flat. Its plans for raising supplies up to about 2012 rest on a growth of output from Russian independent producers (including oil companies) and the acquisition at favourable prices of growing amounts of Central Asian gas – which for the time being lacks other means of reaching rich markets. Meanwhile Gazprom is

¹⁶ Rosstat for production figures and Russian Customs Service (www.customs.ru) for trade volumes. However, the Customs data appear not to identify gas that transits Russia (mainly from Central Asia) to Western CIS and Europe as imported, so other sources are needed to get a precise fix on the re-export of non-Russian gas.

also buying its way into Russian projects that others have brought close to fruition (Sakhalin Energy, Kovykta, Itera's field at Beregovoe), using state muscle to encourage the original owners to sell Gazprom a controlling stake.

What it is not doing very much of is upstream development of its own. Its \$20.1 bn investment programme for 2007 includes \$6.4 bn for acquisitions, against \$3.9 bn for development of major fields. Its 2006 capital spending on gas extraction was about \$4.2 bn and total capital spending on hydrocarbons extraction, processing and transport was about \$15 bn¹⁷. Gazprom says it needs to spend R11.5 trillion (\$460 bn at the late-2007 exchange rate of 25 roubles to the dollar) on gas development through 2030 (*Vedomosti* 10 September 2007). That works out at about \$20 bn a year on average – well above present levels. So long as oil and gas prices stay high, and if Gazprom can focus its spending more on its core business, that enhanced capital spending can probably be financed. But the capital spending is an input. How much trust can be placed in Gazprom's achieving the planned output is another matter.

The long-run increase in gas supply would come mainly in East Siberia and the Russian Far East. Sakhalin apart, the bulk of likely reserves in this area have yet to be properly explored and proved up. Output in the region was 8 bcm in 2006, and the Eastern Gas Strategy (Gazprom's version of which has been adopted by the government) aims to raise this to 27.4 bcm by 2010 and 108.3 bcm by 2020 (*Vedomosti* 10 September 2007). Having wrestled the giant Kovykta gas field in East Siberia away from TNK-BP on the excuse that TNK-BP had produced less from it than their licence terms required, Gazprom does not plan to get production there started before 2017 (*ibid.*).

The betting has to be that Gazprom, even if it spends the money, will not deliver the promised output in the time in which it has pledged to do so.

The control of Central Asian oil and gas supplies is one option for maintaining non-CIS exports for which the present Russian system is well-suited. The 12 May 2007 pipeline deal between Russia, Turkmenistan and Kazakhstan is a sign of progress in that direction. It locks Turkmenistan into supplying increasing amounts of gas through Russia. (*Oxford Analytica Daily Brief*, 14 May 2007) At present Russia can buy gas from Central Asia at around \$100 per thousand cubic metres (kcm) and sell it on to Europe at about \$240. The new Turkmen leader appears to have forgone the option of by-passing Russia by delivering gas through a Transcaspian pipeline (yet to be built) via Azerbaijan, Georgia and Turkey. Probably the prospects of Russian political support and Russian up-front finance for the new pipeline (northwards along the eastern side of the Caspian) tipped the balance.¹⁸

What are the prospects for Russia at least maintaining oil and gas supplies to Europe, given the slow hydrocarbons output growth anticipated in Moscow? EU25 gas consumption rose at 2.3% p.a. in 2000-05 (BP, *op. cit.*), and there is no obvious

¹⁷ (www.gazprom.ru/documents/presentation_29.06.2007_Ananenkov.pdf, accessed 8 October 2007, at slide 33, with roubles converted to dollars at the average 2006 exchange rate of R27.2 = \$1).

¹⁸ However, an apparently very well-informed Russian source tells me (private communication, October 2007) that Turkmenistan has subsequently indicated continued interest in the Nabucco project, and that Russia can make a fuss but cannot block the building of a Transcaspian pipeline.

reason why this growth should slacken dramatically. So the slow projected growth of Russian gas production, on the face of it, looks like a problem for Europe.

One source of concern can probably be discounted for the next few years; this is the Moscow talk of switching gas deliveries eastwards. There are indeed plans for deliveries to China and the Pacific Rim; and liquefied natural gas (LNG) is contracted already from Sakhalin to Japan and Mexico. But these developments are, first, mostly some way ahead and, second, dependent on the development of gas fields in East Siberia and the Russian Far East; they would not be a diversion of existing West Siberian sources of supply to Europe. Indeed, the Russians are building the Nordstream pipeline under the Baltic, adding pipeline capacity to Europe. And Gazprom has retreated from plans for future gas supply from the (yet to be developed) Shtokman field to go as LNG to the US East Coast; instead, it now plans to add Shtokman gas to pipeline supplies to Europe in the first phase of the project, with only part of the output going in the second phase into LNG.

So far as other policies for maintaining or expanding exports to Europe are concerned, the picture is mixed.

There will probably be some success in further constraining deliveries to Western CIS countries, if only because of the price rises that have been negotiated. There seems also to be considerable success in tapping more Central Asian gas at bargain prices (though these will probably rise over time) for transmission to Europe by Gazprom.

The prospects for releasing more oil and (especially) gas for export by constraining domestic consumption – through fuel substitution, through raising domestic prices and by promotion of greater energy efficiency – are less clear. There are genuine political constraints on the raising of domestic gas and electricity prices, both to industrial users and to households.

The planned rises in gas and electricity tariffs are not trivial. The Federal Tariff Service calculated in September 2007 that meeting the target of raising gas prices to Russian industrial users enough to equalise Gazprom's rate of return on export and domestic industrial sales would entail a three-fold price increase in the latter. And the date for meeting this target is not far off: 2011 (*Vedomosti*, 7 September 2007). There would be an immediate knock-on effect on electricity costs and prices.

In the electricity industry itself the aim of Anatolii Chubais' liberalization programme is to separate generating assets from distribution, privatise them and sell them, thus raising funds for the repair and improvement of the industry's infrastructure. Selling electricity production assets to private investors, including foreign investors, will work so long as electricity charges to commercial users are freed by 2011; more precisely, the success of the plan depends on investors being confident that this will happen. It is planned but not yet legislated.

Obviously, these price increases will provoke resistance. They may be delayed. That would constrain Russia's gas export potential in two ways: it would keep domestic incentives to curb energy consumption weak and it would restrict the investment funds available to Gazprom.

How much investment is needed is impossible to say. For gas and electricity, the figures bandied about, some of which have already been mentioned, come from interested parties. In the case of oil, where less sensitive policy issues are at stake, the numbers may be a little more trustworthy. Leonid Fedun, a vice-president of Lukoil, says that the investment of \$300 billion in the oil industry over the next 8-9 years is needed to prevent output falling (Belton 2007). That, at an annual rate, is around one-third more than the total fixed investment in the whole 'fuel-energy sector' in 2006.¹⁹

The turn to statism in Russian economic policy, dating from around the time the *Strategy* was drafted, was not anticipated in its text.²⁰ It may well hamper improvements in energy efficiency: for a start, it strengthens the position of energy-sector monopolists like Gazprom. In the medium term, for example, Gazprom plans to buy and trade increasing amounts of gas produced by independent gas producers (including oil companies). Its control of the trunk pipeline system, and of all storage and processing of gas, however, has been used brutally to get control of non-Gazprom gas and to prevent other Russian producers benefiting from export prices. That stifles the incentive for independents to increase gas output in the first place.

Top-down management of fuel substitution might be quite effective, but a lot depends on the very ambitious nuclear programme.

There is not enough hard evidence for quantifying probable outcomes through 2010, let alone 2020. This review of the issues should however provide guidance about the key developments to monitor.

Long-term implications of 'energy power' for the Russian economy

Whatever the restrictions on its capacity to increase oil and gas exports, the Russian economy will for some years, at least, be developing on the back of those exports. Does that mean it is threatened by the 'natural resource curse'?

If metals (steel, nickel, aluminium and gold, in particular) are added, Russian export dependence on raw-material-based industries rises to around 80 percent. The success of these industries as exporters has had obvious benefits for the country: rising revenues funding investment; rising state funding of social benefits and pensions; and a greatly increased claim on the wider world's attention. But it also has drawbacks. Broadly speaking, Russian hydrocarbons and metals exports are not highly processed. This might not matter if research-based production in other sectors was flourishing; that could open the way for sustained long-run growth when oil prices fall – or merely stop growing. But it is not. A detailed, product-group-by-product-group study shows that Russia is weaker as an exporter of medium and high-technology products than Brazil, China or Turkey (Cooper 2006).

¹⁹ This is a back-of-a-small-envelope calculation. Rosstat gives fuel-energy-sector fixed investment in 2006 as 13.9% of total fixed investment, and gives the latter as 17.9% of GDP (in roubles). Converting the GDP figure to dollars at the exchange rate produces a figure of \$986 bn, so fuel-energy-sector fixed investment in 2006 was, at the exchange rate, of the order of \$24.5 bn.

²⁰ That, at least, is my reading of the text. It is full of references to the state promoting market institutions, to a serious electricity reform, etc.

Russia is in no position to compete with low-wage Asian producers of manufactures. It might perhaps, as the Putin leadership plans, build on past strengths in military-related high-technology areas like aerospace, but it has not yet done so. Worse, domestic industrial output that competes with imports has been growing less strongly than the corresponding imports (Ollus and Barisitz 2007). This suggests that the so-called ‘Dutch disease’ may be infecting Russia: growth in natural-resource exports pushes up the exchange rate, making other parts of the economy less competitive than they would otherwise have been, whether as sources of exports or of import-substitutes.

Dutch disease – from which the Netherlands has made a pretty good recovery – is one of a family of ailments that some economists have grouped together and labelled the natural resource curse. The empirical basis for this diagnosis is the relatively slow growth in the late 20th century of countries that at the start of a 20- or 30-year period of observations had a high ratio of natural-resource exports to GDP: relatively slow growth even when adjustment was made for other influences (see notably Sachs and Warner 2001). One version of the curse is that wealthy and powerful natural resource companies, whether privately-owned or state-owned, provide a setting in which corruption can flourish; the economy can easily come under the sway of politicians who live off the (relatively) easy pickings of these industries. That may or may not be a widely developed phenomenon, but it certainly fits contemporary Russia. That does not augur well either for economic diversification or for good government in the future.

I have argued that Russia is a good deal more than a petro-state. Oil and gas employ only a tiny fraction of its work-force, and do not lever up wages in other sectors. It has a dynamic services sector and a manufacturing sector that at least provides a wide range of import-substitutes, even if it is not competitive as a producer of exports. Some diversification has been taking place. Still, Russian economic growth is sensitive to the oil price; dynamism in non-energy tradables is lacking; and there are some symptoms of Dutch disease. On top of that, the country has weakened its own hydrocarbons sector by increasing state control of the oil industry; and it faces a declining labour-force and the end of recovery growth through the using-up of previously under-used capacity, as well as the rising real exchange rate that produces the Dutch-disease symptoms. Fixed investment has been modest for a catching-up, middle-income country; it has risen sharply in 2007, but mainly (on a preliminary assessment) because of rising capital spending by state-controlled companies. State-managed investment is unlikely to be effective in offsetting the influences favouring a slowdown.

I do not subscribe to the melodramatic view that the Russian economy is about to implode because of an overload of state control. But I do consider, on balance, that Russian growth is likely to slow over the next few years. It seems also to be the case that, even as a supplier of oil and gas to the rest of the world, Russia will at best show only slow growth. That, however, is the prospect for other major oil and gas producers as well. Somewhat slower growth than of late looks likely.

Conclusions

For the European Union the principal concern is gas supplies. These come to Europe mainly through pipelines and sourcing is rather rigid. Sources of supply for oil are much more readily changed.

The present energy-supply situation between Russia and the EU is not quite one of mutually assured dependence. Yes, Moscow needs the money, and we need the oil and gas. But the bargaining positions are not symmetrical. Russia has entrenched, state-owned monopoly exporters: Transneft for oil and Gazprom for gas. Effectively, the Russian side is a single negotiating unit. On the EU side, different companies and different governments act separately. National dependence on Russian gas as a share of total gas usage ranges from about 2% in the UK through something of the order of 40% in Germany to 100% or close to 100% in several eastern members of the EU, including Finland. The incentives to solidarity are weak.

The desirable arrangements on the EU side, so far as gas is concerned, are well-rehearsed (*The Economist* rehearses them once a month): more liquefied natural gas (LNG) terminals to facilitate gas supply from further afield; more inter-connecting links in the European pipeline network to allow more switching around of supplies from different sources; determined implementation of the European Commission's Competition Directorate programme to break up European energy monopolies like Ruhrgas, Gaz de France and Eni (natural partners for Gazprom); more convergence on a common EU energy policy. These would weaken Russia's market power. Supporters of energy market liberalization, however, cannot expect rapid progress towards it – if indeed there is any progress at all.

Meanwhile the real worry is not so much Russian use of energy leverage but Russia's doubtful capacity to increase, or even maintain, its oil and gas supplies to Europe. That depends primarily on internal Russian developments: on the rapidity with which remaining major gas fields in Western Siberia are developed; on some recovery of momentum in an oil industry rendered sluggish by high taxation and increased state control; on the continued cornering by Russia of Central Asian gas; and on the Russian state's ability to push through a real liberalisation of the electricity industry and increased gas and electricity prices to Russian commercial customers.

The bottom line for Europe is that will probably need to supplement Russian oil and gas supplies with supplies from elsewhere: not for the sake of preserving its 'energy security' against a state that wants to play political games with hydrocarbon supplies, but to insure against that state's difficulties in increasing production.

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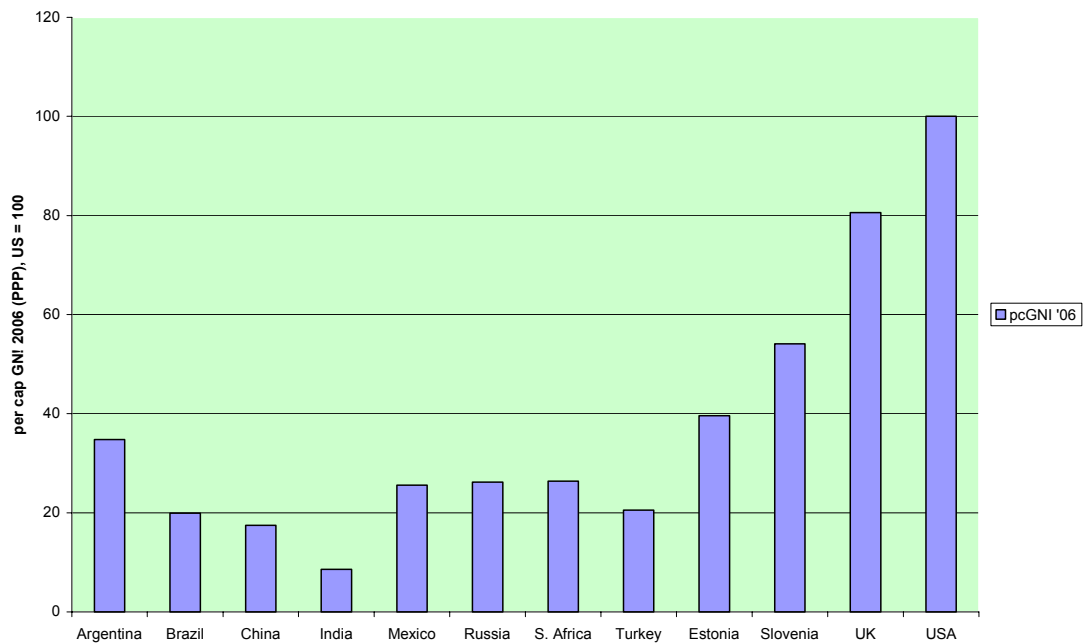
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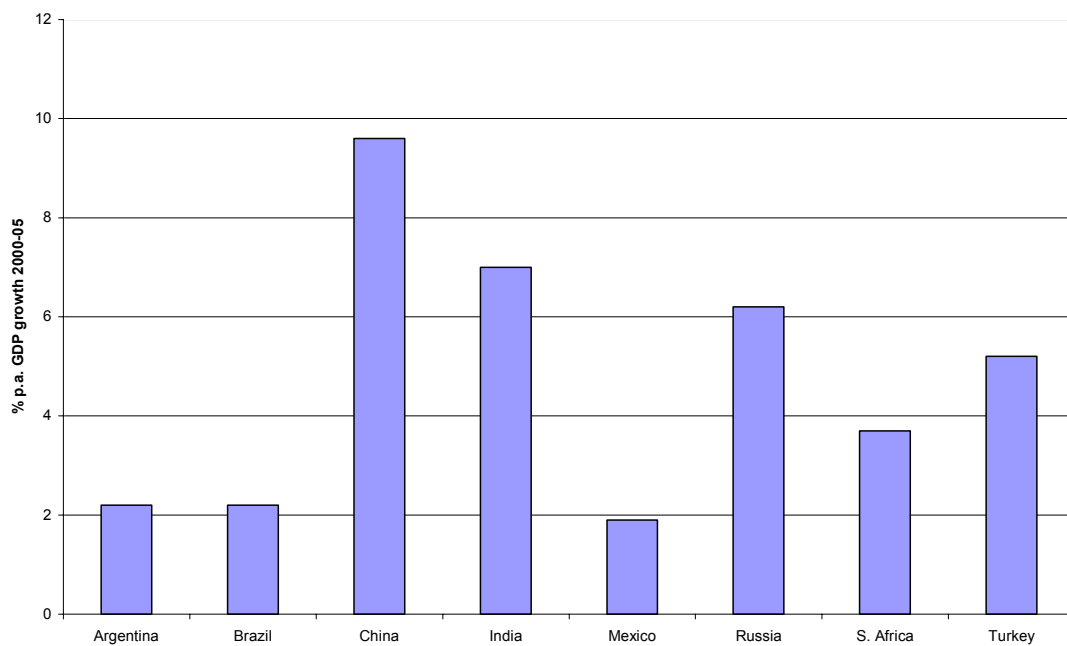
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Chart 1. Per capita gross national income in 2006 as % of US for selected countries (based on \$ at purchasing power parity)



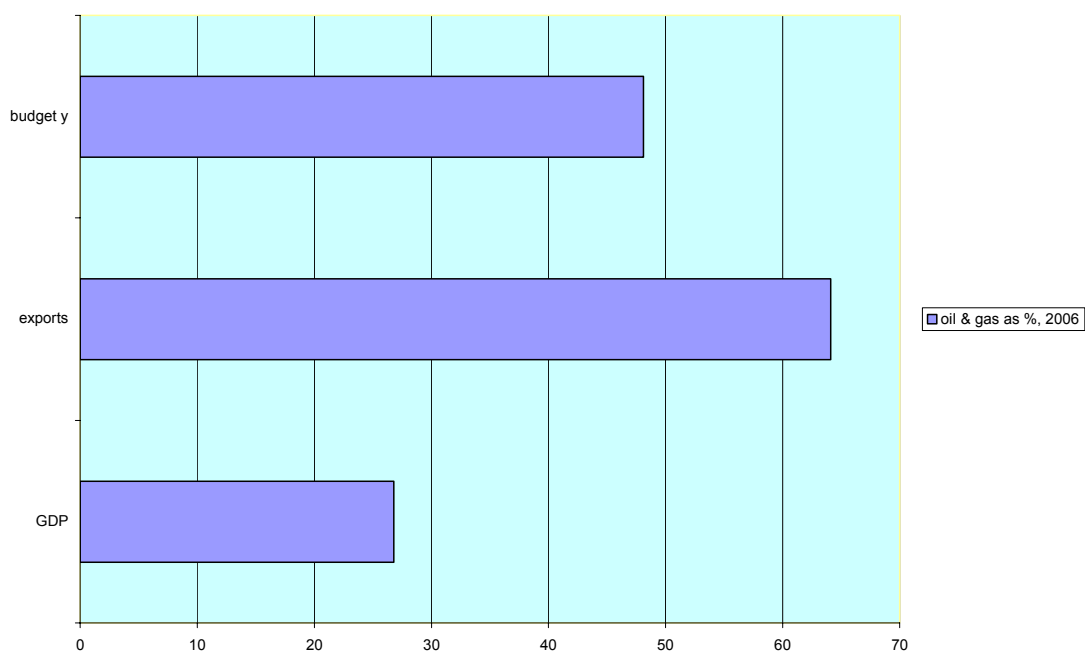
Source: Derived from World Bank, *World Development Indicators 2007*.

Chart 2. Annual average rates of GDP growth, 2000-2005, among selected middle-income countries.



Source: As Chart 1.

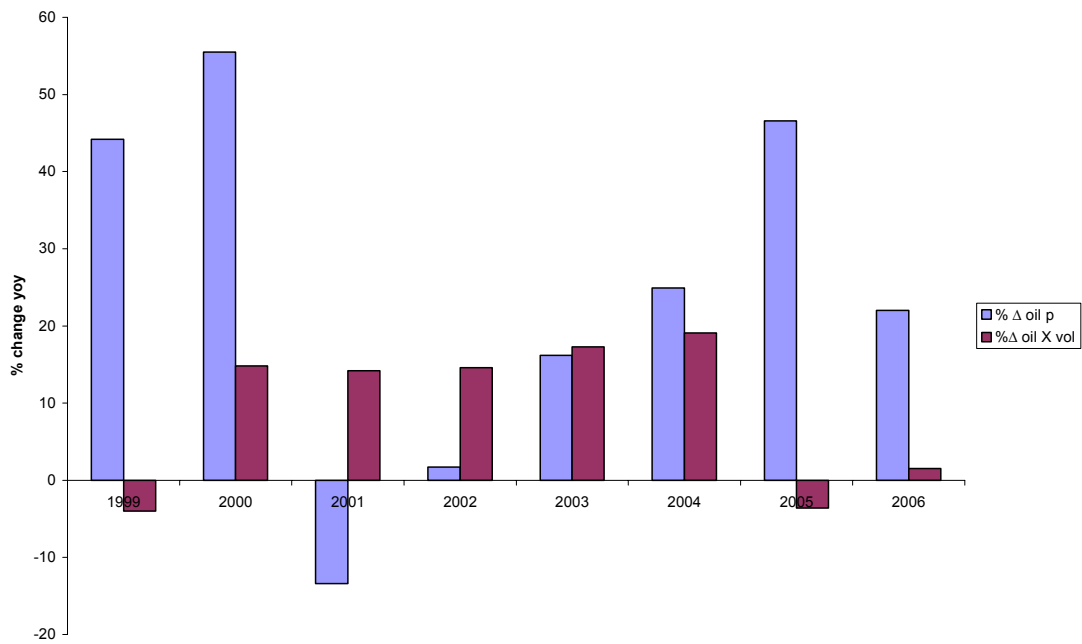
Chart 3. Some indicators of Russian dependence on oil and gas (%)



Notes: The bars indicate the % contributions in 2006 of the oil and gas industries to, in descending order, federal budget revenue; merchandise exports, and GDP.

Sources: Derived from Central Bank of Russia (budget and exports); Aleksei Kudrin lecture at the Higher School of Economics, 21 February 2007, for the GDP share (presumably value added share at current prices).

Chart 4. Year-on-year % changes in Russian oil export average prices and volumes, 1999-2006.



Source: Derived from Russian Customs Service data.

Note: Volume includes oil products as well as crude oil.

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