

# What a waste!



## Russian economic success threatened by energy shortage

| By Jeroen Ketting

Russia has to improve its energy-efficiency soon or – surprising though it may seem – the energy giant will soon be confronted with energy shortages. More and more businesses that plan to start production in Russia in fact do not see bureaucracy or corruption as their major worries, but a possible lack of electricity, heat or gas.

Russia consumes roughly three to five times more energy per euro of GDP than its West European neighbors. This high level of consumption can be partly attributed to Russia's harsh climate and energy intensive industry but it is largely the result of the low efficiency of generation, distribution and consumption of heat, electricity and gas. By any standard, such a relatively high level of energy consumption would merit drastic measures by government, business and consumers to put a halt to, or at least reduce, the squandering of energy. But in fact, very little action is being undertaken to remedy this situation.

Russia has an energy intensive economy which is dominated by heavy industry. More than 65% of Russian industrial output

is generated by the most energy intensive industries like electricity generation, energy industry (oil exploration and refining, gas and coal), ferrous and non-ferrous metallurgy and the chemical and machine building industries. Industrial companies consume 50% of electricity and 30% of heat generated in Russia and most of these industries continue using obsolete technologies and equipment. Almost 40% of Russian production assets date back to the period after WWII, whereas almost 45% was installed from 15 to 25 years ago. The energy consumption by these industries exceeds worldwide levels of energy consumption in analogous industries with 40% to 220%.

The low level of efficiency in Russian energy consumption is a legacy of the planned

economy of the Soviet era, in which the cost of energy was not taken into account in the generation, distribution and consumption of heat and power. In the Soviet production culture the volume of production – and not quality and cost of production – was the main goal. In addition to this, the relatively low cost of energy and the abundance of energy resources in Russia contributed to the low priority of energy efficiency in Russia.

Heat and electricity tariffs in Russia are still substantially lower than in the EU although tariffs have been rising steadily. Russia still has a system of cross-subsidisation in which residential end users of energy are subsidized at the cost of industrial end users. As a result, Russia has the unique situation where industry pays higher tariffs than households. This situation should change in the near future as a result of the reforms in the communal housing sector and the energy sector which should finally lead to households paying the full price for heat and electricity. Tariff formation in Russia's energy sector does not reflect the real economics and costs of generation and distribution of gas, electricity and heat. As a result, the internal Russian markets for gas, electricity and heat does not allow the utilities to generate sufficient revenues for investments in substitution of the outdated assets. Without price reforms, necessary investments in improving and expanding the energy generation and distribution network cannot be financed. With relatively low electricity cost and almost no metering for heat consumption – households pay a fixed sum for heat related to the size of their living space – consumers have no incentive to save energy.

As recent winters have shown, breakdowns of boiler-houses and heat networks happen regularly during periods of intense cold resulting in interruptions of the supply of heat and hot water to end users. Heat consumption increases during these cold periods and generating capacities are not capable of supplying the necessary heat and hot water to end users. When people use electric heaters and domestic boilers to compensate for the lack of heat, the limits of power generation are

quickly reached. The reason for this is the outdated energy infrastructure in Russia. About 80% of all gas fired boiler-houses (producing heat) operate at between 60% and 80% of their capacity. Due to poorly maintained heat transportation and distribution networks, another estimated 30% of generated heat is lost during transportation to the end user.

Inefficient energy use combined with low investments in generation and distribution capacity increases the risk that the Russian energy sector will cause a slow down of economic recovery and growth in the near future. Recently, concern has risen as it became apparent that an energy deficit is looming. As Russia's GDP grows, energy consumption increases in parallel. The Russian energy sector is already experiencing difficulties in meeting this increasing demand for energy. In 2008, energy demand will equal the available energy generation capacity. This means that there will be an energy deficit. This deficit cannot be reduced in a short time span as the minimum period for building new energy generating capacity and reconstructing existing installations is about five to seven years.

Considering the fact that domestic consumption of oil and gas is rising along with the growth of GDP, the question

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*Environmental damage caused by corroding pipelines on streams near the Russian Kolva River. Photo: Robert Wallis/Corbis.*



arises how Russia is going to meet its gas and oil export commitments. Although Russia has large reserves of oil and gas it is already using its full capacity to explore, produce and transport the volumes of oil and gas needed for internal consumption and export. Moreover, about 50% of the known reserves are located in areas with very extreme weather conditions and logistical problems such as the Barents Sea and remote Siberian areas. The objective of the Russian Government is to double the GDP by 2012. Without a strong EE (energy efficiency) effort resulting in a reduction of domestic gas consumption, it may become difficult for the Russian government to combine a doubling of GDP with secure domestic and international supply of oil and gas.

For businesses the tight supply of electricity, heat and gas (gas used in industrial heating and drying processes) is becoming an increasing problem. More and more Western and Russian businesses that plan to start production in Russia do not see traditional issues as bureaucracy, weak enforcement and corruption as the main barriers to investments in Russia; the main bottleneck is whether or not, for a new project at a particular site, electricity, heat and gas can be obtained.

Continued economic growth and increased living standards in Russia depend



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not only on the vast export of natural resources, diversification of the economy and increase in the volume and quality of industrial production; but also on more efficient use of energy in the generation, distribution and consumption of heat and (electric) power. Without taking urgent measures against the inefficient energy use the Russian heat and power sectors will hinder overall economic growth.

The Russian government recognizes this problem. According to the official Russian Energy Strategy to 2020, present-day energy consumption in Russia could be lowered by 40% to 48%, or 360-430 million tons of coal equivalents, in 2020 through effective energy efficiency measures and structural changes in the Russian economy. That means that almost half of Russian energy consumption could be conserved if energy saving potential were fully realized. It is obvious to all that there are substantial EE gains to be achieved in Russia.

However, no effective action has yet been undertaken. Ambitious goals, objectives and programs have been formulated but the implementation of the numerous programs leaves much to be desired. Government programs often do not define the implementation mechanisms nor do they identify the institutional bodies responsible for implementation. Legislation concerning EE is seen more as a set of recommendations than as a strict legal framework.

Market mechanisms are either completely lacking or functioning poorly in the Russian energy sector. On one hand, competition between companies involved in energy generation, distribution and consumption is weak; on the other hand, the government strictly regulates pricing. Mechanisms, incentives, subsidies, taxes, support, and knowledge are among the missing elements to effective implementation of EE by the energy sector. Taking full advantage of the development of EE in a country like Russia may be achieved only by establishing a system with a clearly designated legal structure and unified rules of cooperation for participants. The lack of such a system is the bottleneck hindering the development of EE initiatives as this moment.

One could wonder why so little is done while



Photo: James Hill/Hollandse Hoogte.

the rationale for EE in Russia is so strong and pressing. For any EE project to work three components are needed: an object where EE can be improved, technology that allows for increasing EE at this object, and money to finance technology and implementation of the project. There is a wide choice of objects – installations where EE can be improved – in Russia. Objects can be industrial end users of energy, such as fertilizer and metallurgical plants, but also energy generators and distributors, such as municipal district heating companies. A score of EE technologies are available that have proven results, are relatively simple to work with and can be applied to a wide range of projects, and allow for relatively short payback periods. The biggest barrier to development of EE in Russia is the lack of finance. Whereas on the supply side, increases in the capacity of energy generation and distribution require considerable political will and substantial investments, changes on the demand side require control of consumption, individual will and relatively modest investments. However, even modest sources of financing

for EE investment projects in Russia are virtually unavailable. This is because EE financing in Russia faces a classic development problem: capital markets will not organize to finance energy efficiency unless there is a sufficient volume of commercially viable (i.e. providing competitive returns) EE projects that need financing, but the market cannot develop a sufficient volume of projects without adequate financing. In addition to this there is a great lack of energy management skill in Russian industrial enterprise and a lack of awareness of the potential economic benefits that EE may bring to company managers and financiers.

Despite the commitment of the Russian Government to energy efficiency as expressed in its “Federal Program for Energy Conservation in Russia”, the financial sources for energy efficiency from its programs are limited. The implementation of the federal program depends mainly on the financial involvement of regional administrations and the private sector. Only international

financial institutions such as the EBRD and the IFC are currently funding EE projects in Russia.

In order to increase EE initiatives in Russia a number of measures could be taken. Higher energy tariffs in Russia would lead to higher margins for energy savings and increased revenues that could be reinvested in improving energy infrastructure. In order to raise energy tariffs in a fair way, based upon a modern economic

rationale, the existing system for tariff setting should be modernized first.

Fiscal incentives at consumer level could be created by the government and a clear and transparent legislative framework favoring and enabling EE in the entire energy value chain could be established. This, in combination with further liberalization of the market, would allow private players to take the risk of investing in medium to long term EE projects.

The establishment of a mechanism of reciprocity of EU investments in energy efficiency in Russia would guarantee that the EU supply of know-how, technologies and funding to Russia will in turn guarantee secure energy supplies by Russia to the EU. The volume of such supplies could be linked to the actual amount of savings realized.

The benefits of introducing these measures and increasing EE in Russia could be sizeable. A new area of business opportunity could develop in a promising market that capitalizes the vast EE potential in Russia through realization of the increasingly large potential for financial savings.

Developing EE initiatives in the framework of EU-Russia relations may provide a good opportunity for a balanced, positive and not politically charged area for cooperation. The EU could supply technology and funding to Russia whereas Russia could match the EU's need for security of energy supply. Most important of all, the environmental gains would be to the benefit of the entire planet. ■

### Business opportunities

Russia today offers a large and growing potential not only for energy efficiency, but also for other money-saving products and services. This means there is a score of new business opportunities for European countries to sell equipment, technologies and know-how to Russia. On the end user side in the heat sector alone there is a need for individual metering devices, thermostatic radiator valves, insulation of apartments and buildings, and control and regulation equipment of heat in apartment blocks. The heat distribution sector has a great need for equipment and technologies to replace outdated substations, reduce water leakages, insulate distribution piping and install variable flow pumping. On the side of heat generation boilers need to be rebuilt, air pre-heating technologies and burners need to be improved and small scale CHP (Combined Heat and Power) needs to be applied in boiler houses.