

Waking the Giant

ELENA MERLE-BÉRAL describes how the world's largest energy nation would benefit from developing renewable sources of energy, despite its wealth of fossil fuels

Russia is a renewable energy sleeping giant. It has huge potential—biomass, hydro, wind, geothermal, solar and tidal—but this is hardly developed. Why? Many believe that only energy-dependent countries need to develop renewable energy, while Russia, as the world's largest producer and exporter of fossil fuels, does not require this 'expensive toy'. Yet it can play a role even in the Russian energy mix.

Russian experts estimate the country's economic renewable energy potential may correspond to about 30 per cent of its actual total primary energy supply (TPES). One study assesses renewables' economic potential at more than 189 million tonnes of oil equivalent (Mtoe) a year compared to 640 Mtoe of TPES in 2003. Yet current use is insignificant. Renewable energy (excluding hydro) and waste account for only 1 per cent of Russian TPES —increasing to 3 - 3.5 per cent when large hydro is taken into account.

The accuracy of these estimates can be questioned, but it remains clear that the diversity of Russia's geology, climate and terrain has endowed it with significant and various renewable energy resources — and that it has the scientific and technical base to develop them.

Modern technologies

Research and development on renewables started in the Soviet Union in the 1920s, and since then Russia and other former Soviet states have developed nearly all the currently known renewable energy technologies. Their cost is lower than in western countries — and so, typically, is their quality and reliability. Following the decline in industrial production of the 1990s, many idle plants and factories, especially in the military complex, converted to producing more modern technologies, including renewable energy systems. But, lacking ready markets, a commercial industry has been slow to develop.

Why should Russia care about renewables while it has abundant oil, gas and coal reserves? There are many applications — including heating and both large-scale and decentralised electricity generation — where they may have a competitive advantage over conventional energy sources. There will be more such applications in future as domestic gas



Mikhail Bogomolov/UNEP/Satit Pictures

prices increase and the cost of renewable energy technologies falls further.

Although Russia as a whole exports energy, most of its regions import fossil fuels from a few energy-rich ones, especially Western Siberia. Transporting fuel over the vast distances between regions dramatically increases its total cost: indeed, some remote territories — such as Kamchatka, Tyva and Altai — spend more than half of their budgets on energy. Supplies, moreover, are disrupted quite frequently.

Most regions, however, have locally-available renewable energy resources that can be exploited to improve energy security and reduce costs. Geothermal plants are viable in Kamchatka, the Kuril Islands and the North Caucasus. Large-scale use of biomass energy is cost-effective in north-western Russia, which has a well-developed pulp and paper industry. Wind projects can eventually become commercially attractive in far eastern coastal areas, in the steppes along the Volga River and in the North Caucasus. Many regions enjoy favourable conditions for small-scale hydro-electric power.

Potential market

There is an enormous potential market for off-grid renewable energy systems. About 10 million Russian people are not connected to an electricity grid, and are served by stand-alone generating systems burning petrol or diesel fuel. Remote northern and far eastern areas get their fuel by rail or road, sometimes even by helicopter. The cost of transport is not entirely borne by the users of these systems, and removing subsidies would make renewable energy a viable alternative. The Russian 'dachas' or country houses provide another potential market. Nearly all Russian families have a country house, or a small plot of land where they grow vegetables and fruit: many of these dachas are not connected to a grid, many others have only an unreliable power supply.

Using renewables for heating can be particularly attractive in Russia's cold climate. Directly using geothermal energy for space heating and hot water is commercially viable in Kamchatka and other regions with geothermal resources. Converting coal- or oil-fired district heating boilers to burn biomass (especially wood waste) is also cost-effective, particularly where consumers face unsubsidized heavy fuel oil and coal prices. Small and medium-sized boilers have already been converted in this way Belarus, Estonia, Latvia, Lithuania, and some Russian regions.

Efficient policies

Renewable energy can contribute to regional economic development, create local jobs, and cut air pollution and greenhouse gas emissions. Increasing domestic use of renewables would free more oil and gas for export. This could be particularly important as the oil and gas sectors face significant investment challenges to meet both domestic and export demand: IEA estimates suggest that they will need to invest \$24 billion per year, on average, until 2030.

The IEA projects that Russia's total primary energy demand will grow at an average rate of 1.3 per cent per year from 2002 to 2030, on a business-as-usual scenario, reaching 885 Mtoe in 2030. Renewable energy use will meanwhile grow more than twice as fast, at 2.7 per cent; yet it will account for only 15 Mtoe or 2 per cent of primary energy demand in 2030, not including hydro — which will supply another 17 Mtoe. But prospects will be brighter if the government adopts efficient policies and measures to ensure a level playing field for different energy sources.

The current structures of the energy market and domestic energy prices are major barriers to increasing the use of renewables. Russia's energy mix is dominated by natural gas, accounting for 54 per cent of TPES, and 43 per cent of electricity generation. Domestic gas prices are state-controlled and are often kept below cost, as are electricity and heat tariffs. Cross-subsidies are still widespread. So it is not surprising that renewable energy is often not competitive compared with the distorted prices of conventional energy.

Nevertheless, Russia is making important progress in moving toward market-based pricing. Domestic gas prices are gradually rising, opening new opportunities for renewables. An ambitious programme of electricity sector reform reflects recognition among policymakers that it is vital to create markets that operate in response to genuine price signals. The key is how the programme will be implemented. Reform of the district heating sector, however, is less advanced.

Improving the overall investment climate, by continuing economic, financial, legal, regulatory, and fiscal reforms, is essential both for renewables and for the energy sector as a whole. If Russia maintains and extends the reforms — and eliminates subsidies for conventional energy sources — the giant will begin to wake ■

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