

Fact sheet – Moscow City combined cycle power plant

A part of Russia's modernization offensive, the combined cycle power plant (CCPP) in Moscow City is an excellent example of how power and heat can be generated cleanly and efficiently even in the center of a major city. At the heart of the power plant are two Siemens SGT-800 gas turbines and one SST-700 steam turbine per block, which are contributing substantially to efficient power generation.



Russia's energy industry plays a key role inside and outside the country

- Consuming roughly 1,000 terawatt hours per year (2011), Russia is the world's third-largest energy market. Since 2000, energy requirements in the country have increased at an average rate of 1.5 percent a year and, according to official estimates, will continue to rise. By way of comparison, energy requirements in Russia are currently about 70 percent higher than in Germany.
- Natural gas now accounts for 43 percent of total power generation – and the figure is expected to rise. Therefore, gas is – and will remain – Russia's main energy source. An expansion of nuclear power and hydropower plants is also planned. Renewable energy sources such as wind and solar, on the other hand, are likely to remain relatively unimportant in the next few years.
- Over the next 20 years, an additional 160 to 200 gigawatts of capacity will go into operation. However, the net increase in the number of installed plants will be relatively small since many will also be shut down.
- Russia's energy industry is a major supplier to the international energy market: Russia is currently the world's largest exporter of natural gas and its second-largest exporter of oil. Energy exports currently account for some two-thirds of the country's total export earnings.

Russia is modernizing its energy industry

- The Russian economy is heavily dependent on the energy sector and particularly on developments in oil and gas prices on the international markets. The country thus responds particularly sensitively to both domestic and foreign developments.
- The potential for domestic energy savings is enormous. According to a government energy efficiency program launched in 2007, energy requirements can be reduced 40 percent by 2020.
- Much of the equipment in Russian power plants is old. For example, 74 percent of the country's thermal power plants were commissioned more than 30 years ago and 22 percent more than 50 years ago.
- The modernization of existing power plants, which will require major investments, will be the key to meeting rising energy needs. For this reason, Russia is intensifying its collaboration with international energy companies.

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Natural gas is Russia's No. 1 source of energy

- Due primarily to the country's huge gas reserves, natural gas is Russia's main source of energy – accounting for roughly 43 percent of its total power generation. And this figure is set to increase: about 50 percent of the capacity installed in the next few years will be in the area of natural gas.
- Gas power plants generate electrical energy from the burning of natural gas. They have the advantage of being able to respond rapidly to fluctuations in energy consumption since they can be ramped up or down at short notice. In addition, they can be built relatively quickly and economically.
- Gas power plants produce the least CO₂ of all fossil fuel power plants.
- In a combined cycle plant, the hot waste gas from a gas turbine is used to generate steam which drives a steam turbine. The turbines transfer their kinetic energy to generators which produce electricity. Through the intensive utilization of the gas, combined cycle power plants are particularly efficient and reliable, and generate relatively little CO₂ overall.

Moscow City as a prime example of efficient power generation

- A dedicated, state-of-the-art 236-megawatt gas power plant supplies heat and power to the Moscow International Business Center (MIBC) – also called Moscow City (picture 3) – in the city's center since. The district contains mainly office buildings, including several skyscrapers.
- The power plant, which was built to meet strict urban building specifications, combines the latest technologies. For six months a year, in addition to the electricity that is generated, the waste heat from the plant is used for the surrounding area. During this period the overall utilization rate of the fuel rises to over 83 percent.
- The combined cycle power plant can meet the electricity requirements of a city of some 200,000.
- Siemens' high-efficiency industry gas and steam turbines have been a reliable solution for Moscow City for years. Sound attenuation cowls also ensure that noise levels do not exceed 85 decibels in an area of one meter around the turbine. Siemens technologies thus provide solutions for the three key parameters for an inner-city gas power plant: efficiency, low CO₂ emissions and acoustic insulation.

Key figures – Moscow City gas power plant

- Location Moscow, west of the city center
- Area about two hectares
- Commissioning Block II 2007
- Commissioning Block I 2009
- Operator / investor Technopromexport
- Gross electrical output 226 megawatts
- Heat output 490 Gcal / hr
- Electrical efficiency (CCPP) 54 percent
- Overall efficiency 83 percent