

»» Project Information

Implemented by:



Energy efficiency – Mongolia

Safeguard energy supply and reduce emissions

In Mongolia, energy is largely generated using old, inefficient coal-fired power plants, and therefore large quantities of CO₂ are emitted, amongst other gases. Thermal Power Plant IV with an electric output of 580 MW is by far the biggest power plant in the country. On behalf of the German federal government, KfW is investing in modernising and rehabilitating the plant.

Context

Providing a nationwide supply of energy to the population is hampered by geographic and climatic conditions. The local people experience long and very cold winters, and thus need significant amounts of thermal and heat energy that is provided via cogeneration and district heating plants. Mongolia's territory is more than four times the size of Germany, but it has just 3.0 million people. Accordingly, it is difficult and expensive to provide the population with a nationwide supply of electricity and heat energy.

Electricity demand rises by 8 to 10 % each year. The reasons for this lie in the dynamic population growth of an average 1.5 % per year, as well as the economic growth, which was at double-digit rates for a long time and in 2013 totaled 11.6 %. So far roughly 80 % of the country's energy requirements have been covered by seven coal-fired power plants built between 1961 and 1991 with Soviet technology, and a wind farm connected to the grid in 2013. The wind farm, however, operates to a severely limited extent. For geographical reasons, the additional electric energy required can only be imported from Russia. All of the heating energy is supplied via cogeneration from coal-fired power plants - technically and economically speaking this is the most sensible option.

than modern power plants, while the filtration technology used is inadequate. This means the power plants emit high quantities of greenhouse gases and other pollutants.

Operators of power plants lack the financial means to upgrade or expand their facilities because the electricity and heating tariffs regulated by the state are very low and do not cover costs. This means they are unable to raise funds for replacement or expansion investments. Such conditions also hinder private investment. Mongolia is consequently facing a bottleneck to its energy supply, which poses a threat to economic development. The Mongolian government wants to improve the general conditions, raise the efficiency of energy produc-

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Country/Region	Mongolia
Lead executing agency	Thermal Power Plant #4





Mongolian power plant workers consulting. Source: KfW photo archive / photothek.net

tion, promote renewable and CO₂-neutral energies and attract private investment into the energy sector. KfW Development Bank is supporting Mongolia with these efforts on behalf of the German federal government.

Project approach

The effects of most decisions in the energy sector only unfold in the long term. Nevertheless, the efficiency of power plants can be boosted in the short term too with relatively little investment. This is the aim of the programme supported by KfW for Thermal Power Plant IV in Ulan Bator.

The power plant feeds into the central grid system that supplies 96 % of all electricity consumers, and covers 70 % of its demand. Together with two other power plants it also supplies district heating to the capital city of Ulan Bator.

KfW is funding three modernisation measures to enhance the efficiency of the power plant and lower its own consumption of energy:

1. Rehabilitation of water treatment system

The power plant operator is installing a water treatment system optimised based on state-of-the-art technology. The much-improved water quality will reduce biological incrustation in the pipes, fewer chemicals will be required and the power plant's own demand for energy will fall.

2. Cooling water filter and continuous pipe cleaning

To clean the pipelines and heat exchangers in the power plant from sediments and deposits, the facility currently has to be shut down. With a pipe cleaning system, it will be possible to clean the pipes continuously in the future while the plant is still operational. Moreover, a cooling water filter enhances the efficiency of the cooling circuit by filtering out floating particles.

3. Speed-controlled boiler feedwater pumps

The programme envisages replacing two boiler feedwater pumps with frequency-controlled drives. This measure coupled with the resultant potential for optimising processes will significantly reduce the power plant's own consumption of energy.

Impact

After all the components of the programme are successfully implemented, the power plant operator will save 25,000 tonnes of coal each year. Furthermore, the power plant will emit around 80,000 tonnes less CO₂ each year. To achieve this result, a comparatively low sum of EUR 6.80 must be invested per tonne of avoided CO₂. As regards energy supply security, it is also crucially important that the output of the power plant fed into the electricity grid should increase by up to 5 MW, thereby generating higher revenues.

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