# TALCO Energy Audit:

## Improved Efficiency Could Help Solve Winter Electricity Shortages

*The World Bank remains committed to helping Tajikistan solve its winter electricity crisis in the quickest and most sustainable way possible. Based on a request by the Government of Tajikistan, the World Bank recently supported an Energy Audit of TALCO, Tajikistan's state-owned aluminum company, to assess energy saving opportunities and develop an Energy Efficiency Action Plan for the company. The audit indicates a number of financially attractive investments to reduce TALCO's energy consumption.*

**Addressing electricity shortages during winter months is a priority for the Government of Tajikistan.**

Approximately 70% of the population suffers from extensive electricity shortages during the winter. These shortages are estimated at about 2,700 GWh, about a quarter of winter electricity demand, and bring significant social and economic burdens.

As the country's single largest electricity consumer, TALCO accounts for about 40% of the total net electricity consumption and could play a crucial role in reducing the winter electricity shortages.

TALCO consumed between 5,480 and 6,460 GWh of electricity per year in 2009-2011, with the aluminum production output varying between 281,000 and 361,000 tons of aluminum.

**TALCO could reduce its energy consumption by 22% and decrease its greenhouse gas emissions by about 2 million tons of $CO_2$ per year.**

The Energy Efficiency Action Plan for TALCO recommended by the Energy Audit includes 33 measures to reduce energy consumption at the electrolysis process, anode production and plant services.

A seven-year payback period on investment was used as a cut-off for measures included in the Action Plan, but 26 of the recommended measures have a payback period of less than three years.

Implementing the Energy Efficiency Action Plan would allow TALCO to save up to 1,155 GWh of electricity and 197 GWh of natural gas per year. This would reduce electricity and natural gas consumption by about 20% and 37% compared to average consumption in 2009-2011. The power load on the national grid would decrease by 132 MW.

**Once TALCO is more energy efficient, household electricity consumption during winter months could be increased by 25%**.

During electricity-deficient winter months, the energy savings recommended by the audit would allow an increase of residential electricity consumption by 578 GWh, 25% of average consumption in 2009-2011.

In addition to contributing significantly to reducing the winter electricity shortages, TALCO can reduce its annual energy costs by US$ 49 million.

**The Energy Efficiency Action Plan could be implemented within four years.**

| | **Electricity savings (Gwh/year)** | **Natural gas savings (Gwh/year)** | **Energy cost savings (US$/year)** | **Investment costs (US$)** |
|---|---|---|---|---|
| Measures with a simple payback period **< 1 year** | 779 | 48 | 21 million | 7 million |
| Measures with a simple payback period **1-3 years** | 362 | 96 | 26 million | 70 million |
| Measures with a simple payback period **3-7 years** | 14 | 53 | 2 million | 10 million |
| **TOTAL** | **1,155 GWh/year** | **197 GWh/year** | **US$ 49 million** | **US$ 87 million** |

TALCO could start implementing 11 measures without further preparatory work. These measures are expected to generate about 129 GWh of electricity savings per year, with total investment costs estimated at US$ 1.6 million.

Implementation of the other, more technically complex measures is expected to take up to four years and require additional preparatory work. Additional investment costs of these measures are estimated at US$ 85 million.

The audit highlights other energy management options at TALCO, such as shifting maintenance routine of aluminum cells to winter months. About 25% of aluminum cells each year need major repair and maintenance. This is currently done throughout the year, but scheduling the major repair of cells during winter months would decrease electricity consumption by an additional 132 GWh from October to March.

**The Government of Tajikistan has agreed to start implementation of energy efficiency measures at TALCO based on the proposed Action Plan.**

*The Energy Audit was conducted by an international consortium led by Norsk Energi (Norway).*