

ENERGY MANAGEMENT SYSTEM IMPLEMENTATION BY UNIDO METHODOLOGY

ELEKTROPRIBOR

Elektropribor, JSC is located in Kazan and is one of the leading enterprises in aviation construction sector in Russia. The plant focuses on production of various systems and appliances for aircrafts of all types, custom machinery, aggregates for gas transmission services, marine and armored facilities, as well as development of aviation and industrial products. The production complex includes assembling, mechanical processing, casting, stamping, instrumental, galvanic and welding productions, plastic details production and rolling.

In 2014, within the scope of the partnership with UNIDO, Elektropribor has started implementing an energy management system (EnMS). The EnMS was designed to be aligned with the requirements of ISO 50001 and also with the UNIDO Energy Management Capacity Building and Implementation programme.

Energy Efficiency Improvements and Benefits	
Energy savings	3 149 895 kWh
GHG Emissions reduction	1889.9 tonnes CO ₂
Gross monetary savings	2 700 405 RUB (=60 009 USD)
Other non-energy benefits	New ways of energy performance and production measuring
Total investment	1 201 500 RUB (=26 700 USD)
Average Payback Period	0.44 years

EnMS implementation

Along with electricity and gas, the company decided to include water in EnMS scope, as it an energy resource, which consumption could be as well optimized. Since the plant is located within city limits, the costs of wastewater discharge are quite high.

Prior to EnMS project started, in order to cool down metal working equipment and electric furnaces the plant used fresh water and then simply discharged it into water drainage. After including water in the scope of EnMS, identifying significant energy users (SEUs) for this energy resource and their critical operating parameters, the EnMS team has discovered that instead of using fresh water intake for cooling, the plant can recycle and reuse the same water before discharging. This resulted in decrease of amount of fresh water consumed and decrease of waste waters that are costly in urban area, leading to substantial economic benefits.

*By implementing an EnMS system, with the use of UNIDO tools, such as regression analysis, critical operating parameters, and constant performance monitoring, Elektropribor has managed to save within a yearly period **519895 kWh of electricity** and **242783 m³ of gas**, which in monetary terms equals to **60 009 USD**.*

Success factors:

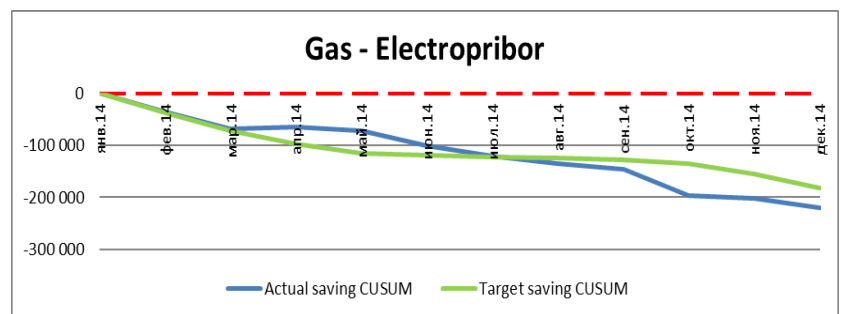
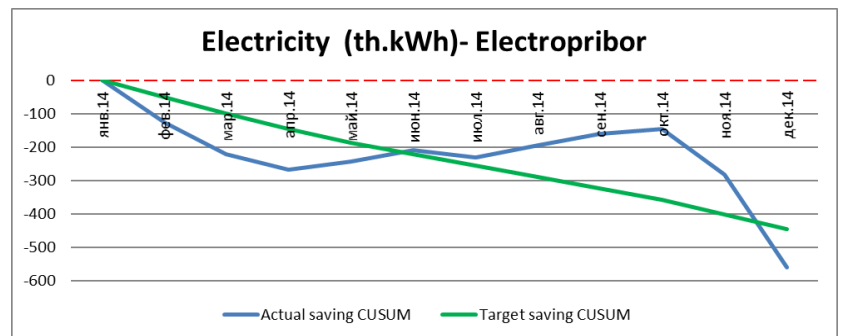
- ✓ Initially strong interest and involvement of the management in the questions of energy saving;
- ✓ The plant already had a functional energy saving programme, with an initiative plan;
- ✓ The specialists, that formed the group responsible for EnMS, were experienced and qualified;
- ✓ The company has been carrying out its own trainings for personnel on Significant Energy Users (SEUs). It substantially facilitated the identification of SEUs and their critical operating parameters.

Examples of implemented low-cost measures

Examples of implemented measures in the framework of EnMS project	Estimated annual savings		Total costs (RUB)	Payback period (years)
	Electricity/ gas	Savings (RUB)		
Installation of additional storage tank for continuous supply of hot water. It allows to reduce running time boiler during pike of hot water.	180000 m ³ of gas	720000	1050000	1.5
Furnaces upgrade for improvements in heat treatment process	6100 kWh of electricity	18300	35000	0.2
Installation of an automatic control system of heat points in 2 workshops	12000 m ³ of gas	48000	120000	2.5

Barriers

- ✓ Among the main challenges for EnMS implementation were the peculiarities of manufacturing site of the company. As the production is partially classified, the output information was not available in the beginning, which has complicated the process of defining variables that affect energy consumption.



Conclusions

- ✓ In general, after participation in the EnMS project, the understanding of importance of energy performance measurement has increased; adoption UNIDO methodological approach has simultaneously improved the reliability and productivity of energy performance models at the enterprise.
- ✓ Additionally, the company started to consider not just specific energy use, but also energy performance indicators verified by regression analysis, when evaluating its energy performance and energy efficiency. The company has also concluded that it is more useful to use other indicators than standard employee hour when measuring its production output.
- ✓ Achieved savings has demonstrated that energy saving goals can be reached without financial investments or reducing output, but only by applying systematic approach to energy performance through constant improvements in operation and maintenance.
- ✓ The case of Elektropribor enterprise has demonstrated that initial commitment of top management, staff qualification, openness to change and emphasis on constant reduction of energy consumption contribute to successful and highly beneficial EnMS implementation.