UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

EnMS implementation by UNIDO methodology on SMEs in the city of Naberezgnye Chelny

Avtotekhnik, LLC

Avtotekhnik is a small enterprise (less than 100 employees involved in production) that specializes in production of units and components for assembly conveyors of large Russian automotive industry plants (Kamaz, Uralaz).

Improvement in EE	
Savings in monetary terms in 2016	767 455 RUB ≈USD 12 790
(10 months)	252 520 kWh of electricity (-24%)
Energy savings	12 700 m^3 of natural gas (-8%)
Non-energy benefits	Reduced risk of energy costs increase due to regression analysis of energy consumption and forecasting the costs
Total investments	195 000 RUB ≈ USD 3250

Annual energy consumption in 2015 was 1.053 gWh of electricity and 146 000 m3 of natural gas. Energy costs account for 1% in total production costs (for the last three years).

Main measures implemented within EnMS on Avtotekhnik:

The Working group, jointly with UNIDO experts, determined the scope of energy resources to be included in EnMS and identified the most significant energy users (SEUs) for these resources: heating system and hot water supply system for natural gas and production facilities for electricity (70% of total consumed energy).

1.Further, the variables were identified, which affect energy consumption on the enterprise in whole and for separate SEUs. Based on data from these variables, regression models of energy consumption were developed.

1.The next step was to identify energy performance indicators based on multifactor regression analysis for electricity and natural gas consumption.

1.System of planning for energy efficiency improvement was organized with identification of opportunities for energy saving by organizational measures, measures of operational control and low-cost technical measures.

At first, the working group established energy performance analysis on a monthly basis, using data from existing system of accounting. But later, regression models enabled them to move to daily monitoring of energy performance, which became one of the major success factors and accounted for high savings results.

Examples of low-cost measures with maximum savings effect:

- Development and implementation of operation schedule for technological equipment;
- Shut-down of the process boiler in the periods of production downtime longer than 2 days;
- Withdrawal of electric boilers from technological cycle and transition to one gas boiler;
- Automatic control in the boiler room depending on the outside temperature;
- Lower temperatures inside production facilities and switching off the warming of technological equipment during down-time.

Challenges and difficulties in the process of EnMS implementation:

- Contradiction in responsibilities when functions of Energy Manager and Chief Power Engineer were combined;
- Lack of investments in energy management;
- High degree of equipment wear, many technological losses, rigid adherence to technology, necessity to stop the equipment to modernize the production lines.

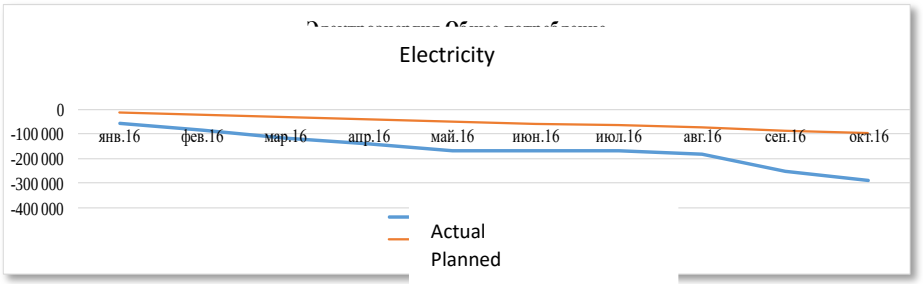
Achieved results:

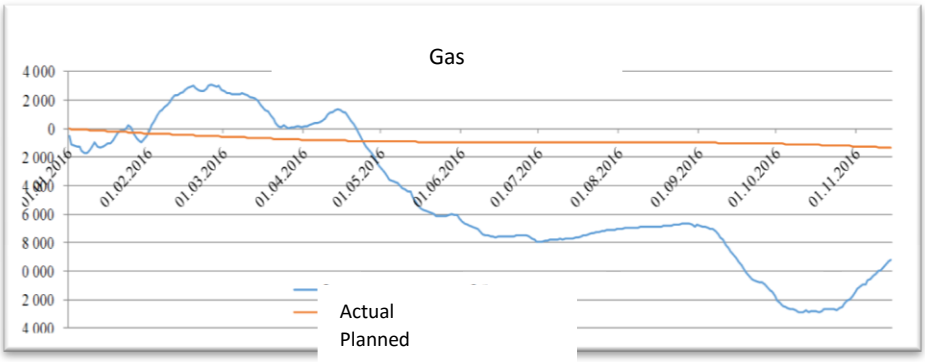
Achieved savings in 2016:

→ 252 520 kWh of electricity (24% decrease in electricity consumption against the base line)

→ 12 700 m^3 of natural gas (8% decrease in gas consumption against the base line)

→ Total savings in monetary terms - 767 500 RUB (USD 12 790)





In addition to organizing a system for managing energy resource consumption and increasing energy efficiency, Avtotekhnik gained the following indirect benefits:

- Increased personnel awareness in importance of efficient energy use and implementation of available methods of energy performance monitoring positively affected the final results;
- Tighter control over established critical operating parameters made control over energy resource consumption more efficient on the enterprise;
- Reduced risk of energy costs increase. Energy performance analysis and decision making based on mathematical regression models, allows to forecast the expenses on energy and to lower the risk of higher tariffs affecting the cost of an end-product;
- Exchanging experiences with other enterprises during regular trainings and webinars increases competence and qualification of employees and facilitates EnMS implementation, which confirms the efficiency of system approach to energy management.