EnMS implementation by UNIDO methodology on SMEs in the city of Naberezhnye Chelny
Domkor Industria, LLC

A large-panel housing construction plant "Domkor Industria" was created to provide prefabricated reinforced concrete construction sites of Naberezhnye Chelny in the years of rapid growth of the city, caused by construction of auto-giant KAMAZ and housing for its employees; subsequently the plant became the basis for construction industry of the city and Tatarstan republic. Today Domkor supplies its products to the construction sites in Tatarstan and neighboring regions. The company is medium in size (employing over 1 000 workers), and energy costs account for 5.2% in total production costs (in 2016).
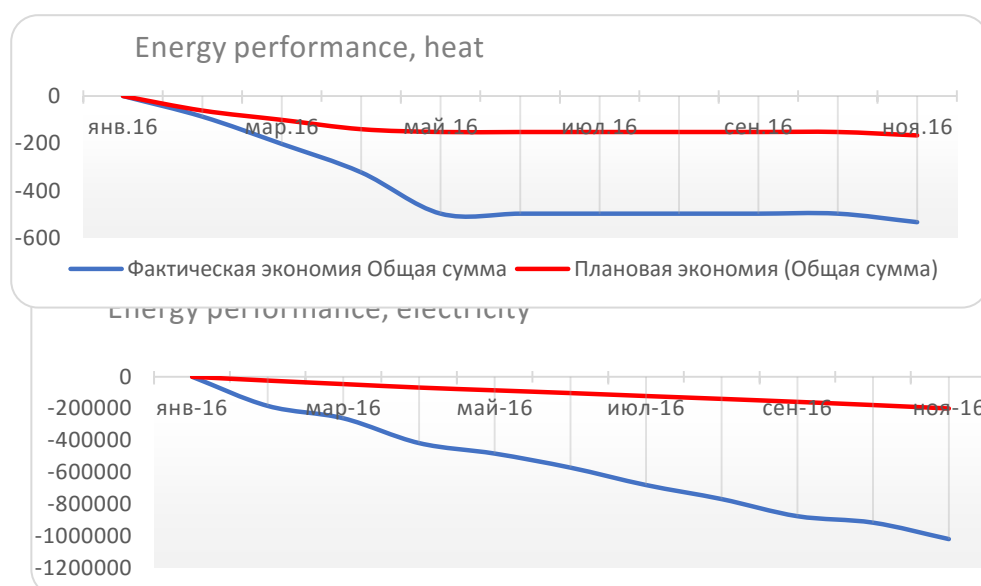
EnMS implementation

Results of EnMS implementation	
Savings in monetary terms	3 562 217 RUB≈ USD 59 370
Energy savings	916 000 kWh of electricity (-10%), 499 GCal of heat energy (-6%)
Non-energy benefits	Higher production efficiency (in terms of required time for production volumes) due to reduced unplanned idle time and increased personnel competence
Reduction in GHG emissions	897 800 tons of CO_2-eqv.
Total investments	455 000 RUB ≈ 7 583 RUB
(equipment and other capital expenses)	0.13 years

Energy management system implemented by UNIDO methodology allowed to move towards system approach to management of energy consumption. In its core – use of energy consumption analysis of preceding (base) year and subsequent analysis of current energy consumption against the base year model. Regression models consider all factors (variables) affecting energy consumption. In other words, it is a method of comparing one's results in past and in real time. Results' monitoring is done by comparing graphs of actual and planned energy consumption.

Achieved energy savings

Energy performance, heat

— Фактическая экономия Общая сумма   — Плановая экономия (Общая сумма)

Energy performance, electricity

Heat savings of 499 GCal (-10% from the base line) were achieved in result of rational use of steaming on the polygon site and on Tensland line, use of steam traps and compliance with Actual savings (total) parameters.

Decrease in electricity consumption by 10% (916 029 kWh) is explained mainly by constant work of the enterprise towards energy efficiency increase and implementation of its energy saving programme.

Examples of low-cost measures that had the highest positive impact on energy performance:

- ☐ Ensuring timely switching on and off of lighting in the plant's subdivisions directly by those people working on each site;
- ☐ Ensuring welding equipment and machines are turned off during breaks in production time;
- ☐ Ensuring that compressors are turned off in weekends, during breaks in production time, and in partial load mode;
- ☐ Timely elimination of compressed air leaks from equipment;
- ☐ Maximum use of efficient compressors;
- ☐ Replacement of old light bulbs with LED models;
- ☐ Control over compressed air requirements and timely shut-off of energy users when the work is finished;
- ☐ Rational use of compressed air when unloading wagons and pumping cement to the workshops. Timely submission of requests for compressed air supply;
- ☐ Launching fans and circulating water supply only at the time of production processes

Results

- ✓ Increased awareness of plant's personnel about more rational energy use. Published Energy policy and documents related to EnMS implementation with open access promote behavioral change in terms of personal impact in energy performance of the enterprise;

- ✓ A set of internal documents was developed, which ensures system approach to energy consumption management, as well as increases staff motivation towards energy saving;

- ✓ The variables (factors) affecting overall energy consumption of the enterprise were identified. Measures were implemented to organize the system for data aggregation by the variables and its use in regression models for energy consumption analysis;

- ✓ Regression models were developed. The models can be monitored and analyzed on a monthly basis. *It became possible to estimate actual current energy efficiency against expected (base) level. One can observe energy consumption dynamics and evaluate the impact of implemented energy saving measures;*

- ✓ Measurement plan was created for data base on variables (factors) affecting energy use. It improves the methodology of energy analysis and allows to conduct corrective actions when there are significant deviations in energy consumption;

- ✓ EnMS working group gained priceless experience in EnMS implementation process, and also important experience in self-organization and in changing established attitudes towards their daily work. Despite additional workload (involvement in ongoing construction), they were able to build a stable system for monitoring and energy performance analysis.