



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Energy management system implementation by UNIDO methodology on SMEs in the city of Naberezhnye Chelny

CNH Industrial Russia

Joint enterprise CNH-KAMAZ Industrial BV was established in 2010 on a parity basis by Kamaz JSC and Case New Holland (CNH) concern, which is the second biggest agrarian producer and third biggest manufacturer of construction machinery worldwide. Since 2013, the plant fully belongs to CNH Industrial and specializes in production of agrarian, construction machinery and municipal engineering.

Although its staff does not exceed 100 employees, the revenue of the enterprise is above 100 million rubles, therefore, it is characterized as large. Energy costs account for 5% in total production costs.

Results of EnMS implementation, 2016	
Savings in monetary terms in 2016 (for 10 months)	4 123 800 RUB ≈ USD 68 730
Energy savings	13 801GJ of heat energy (-24%)
Non-energy benefits	Higher competency and awareness of personnel in available methods for energy performance monitoring and EE improvement; tighter control over established critical operating parameters
Reduction in GHG emissions	8 280 tons of CO ₂ eqv.
Total investments (equipment, other capital costs)	226 750 RUB ≈ USD 3 800
Average payback period	0.1 years

Energy management system implementation

CNHI Russia participated in UNIDO project from September 2015 to October 2016. Together with the Working group of the enterprise, and in line with recommendations and requirements of the programme, UNIDO experts consistently implemented measures on four stages of EnMS implementation - Commitment, Planning, Implementation, and Checking:

1. Working group of CNHI Russia together with UNIDO experts determined the scope of EnMS – i.e. energy resources included in the system of energy management, and identified Significant Energy Users (SEUs) for these energy resources.

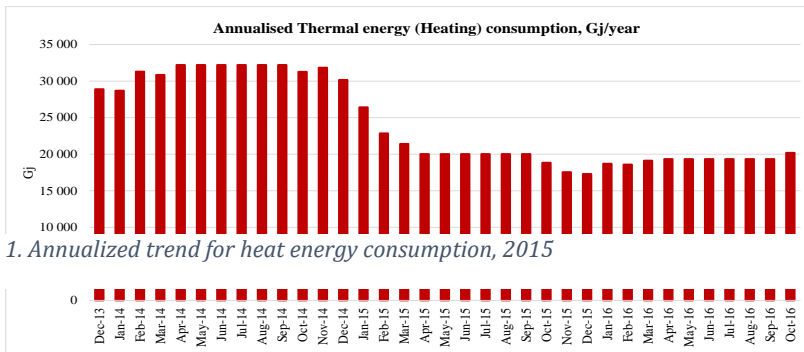
The plant uses three types of energy resources: electricity, heat, and natural gas (since 2015). EnMS scope included electricity and heat energy (15% and 81% of total consumption). Gas is used only for technology (drying, washing and painting chambers, test site) and

Encountered barriers

The financial plan that includes, among other, implementation of energy efficient measures at the enterprise, is strongly linked to production volumes.

Since most of no-cost and low-cost measures up to this point are already implemented on the enterprise, only implementation of high-cost measures was left and it requires substantial capital investments. High-cost measures can be implemented in case of stable growth of production output.

its amount is insignificant.

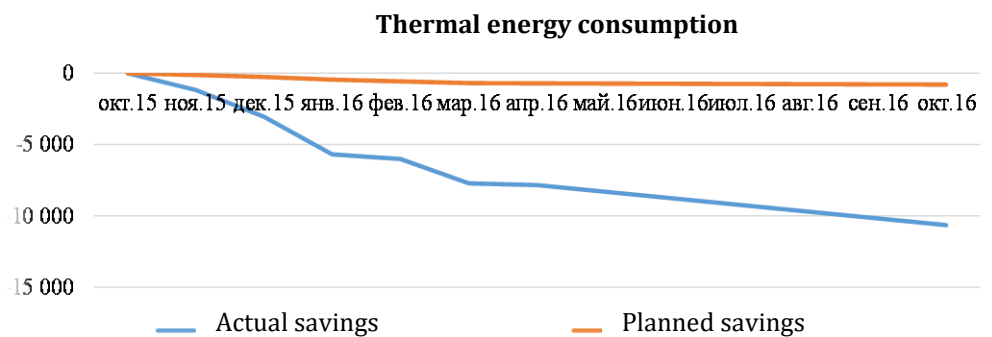


2. Then the Working group aggregated and collected data to build consumption trends for the last 3 years. Lower heat consumption in 2015 also relates to decreased production capacity. Temperatures inside production facilities were lowered in heating season in view of the absence of personnel.

3. The next step was to define the variables, affecting energy consumption on the enterprise in total and on separate significant energy users (SEUs). Based on data from the variables, regression models for energy consumption were developed.

Reasons for decrease in heat consumption in comparison with the base line:

- constant work of the enterprise towards energy efficiency improvement and energy saving,
- lowering temperatures inside facilities in non-working hours.



4. Energy performance indicators were determined based on regression models, and the model for natural gas consumption was added in 2016.

Achieved savings in the heating season of 2015-2016 and October-December 2016 accounted for 13 801 GJ of heat energy (24% against the base line consumption)

5. Energy performance analysis was organized on a monthly basis with the use of data from existing accounting system. In addition to earlier established system of evaluation by specific indicators, the enterprise began to analyze energy performance once a month on a basis of regression models of multifactor analysis of electricity, heat and natural gas consumption.

6. Planning of energy efficiency improvements was organized, with identification of opportunities for reducing energy use by means of organizational measures, measures of operational control and low-cost technical measures.

Strong interest and involvement from the management became one of the critical success factors: constant support from the plant's Director to the process of EnMS implementation helped to achieve highly positive sustainable results and substantial energy savings.

Examples of no-cost and low-cost measures with high saving effect:

- lowering temperature in the production building during off-work hours;
- turning off lighting during off-work hours;
- turning off electric heaters during off-work hours