



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



UMMC – AGRO, JSC

UMMC- Agro, JSC is an agricultural company, established in Sverdlovsky region in 2001. Today it is the managing company of agro-industrial complex, that unites a range of enterprises located in various regions of Russia and connects all their operations in one production chain – from raw materials preparation to end-customer ready-to-eat product.

Teplichnoe, JSC

Teplichnoe complex (Verkhnyaya Pyshma city) was put into operation in 2010-2014 period. Its new greenhouse complex had the most innovative technology in Russia for growing tomatoes and cucumbers in protected soil. Its idea is in growing vegetables in steel tranches on mineral-wool mats with the use of fully automated computer climate support system, drip irrigation, and supply of CO₂, which together provides early fruiting, significant increase in yield and quality.



Achievements of the enterprise prior to UNIDO project

Prior to EnMS implementation, Teplichnoe has been continuously involved in energy efficiency increase, mostly by implementing energy saving activities and constant organizational work. Specialists of energy service also impact this work significantly.

At the beginning, on design stage, the complex was to incorporate the best engineering and technical solutions, including those in energy saving. Production efficiency is achieved by use of modern agricultural and technological approaches of production on protected soil, optimal management of microclimate and mineral feed for the plants in greenhouses. Despite an initially high efficiency level, Teplichnoe constantly undertakes measures to improve it. Hence, in 2014, additional thermal insulation of enclosing structures was done.

The management of the enterprise has strong interest and awareness in the questions of energy saving and energy efficiency increase, and conducts work to systematize these processes.

In order to organize the work on energy saving and to carry it out on a regular basis, a working group was created at Teplichnoe, which is responsible for energy performance monitoring and elaboration of energy saving measures.

EnMS implementation in 2015

Throughout EnMS implementation, along with ISO 50001 requirements, Teplichnoe applied UNIDO methodology in the following areas:

1. Application of regression analysis method to forecast energy consumption and to evaluate the impact of each of the production variables.
2. Inventory of energy users and identification of the most significant ones (SEUs).
3. Elaboration of Opportunity lists in relation to SEUs.

In line with EnMS implementation by UNIDO methodology, specialists of Teplichnoe undertook the following activities:

1. Developed energy policy, defined energy saving goals, assigned roles and responsibilities among personnel.

2. Defined scope and boundaries of EnMS by types of energy resources. The enterprise consumes two types of energy: electricity and natural gas. However, only the latter was included in EnMS scope, because the consumption of natural gas is much higher than that of electricity, as well as because it is more complicated to monitor electricity consumption, as electricity consuming equipment operated in automated mode, with no involvement of operators. Water is supplied to enterprise from its own well. Due to its low use, water was not included in EnMS scope.

3. Base line for energy consumption was defined, so that it would be possible to measure and analyze the effect from EE increase.

Significant energy users and factors affecting the consumption (variables) were identified. When identifying SEUs, the working group found out that the most significant energy user is the gas boiler, located in Sadovy village. In monetary terms, it consumes 77.57% of natural gas and 7.22% of electricity from total energy use of the enterprise.

4. In addition to existing system for energy consumption planning, the system for energy consumption forecasting was set up with the use of developed regression models.

5. Meetings on energy efficiency and analysis of energy performance indicators started to be conducted regularly on managerial level.

Energy saving and EE increase results in 2015

Throughout EnMS implementation the following results were attained:

1. When developing regression models for energy consumption, variables were identified that significantly impacted energy use. Later on, energy performance analysis enabled to assess energy saving potential and potential financial savings, as a result of which the overall set temperature in production facilities and minimum allowable parameters on greenhouse blocks contours were reduced due to additional adjustments in the computer controlling automation.
2. Savings were achieved:
 - Natural gas savings (in comparison with forecasted consumption), calculated with the use of regression methods: 788 000 m³;
 - These savings in monetary terms: 2 900 000 RUB¹ ≈ USD 48 300 (with total investments of 783 000 RUB ≈ USD 13 050).
3. GHG emissions were reduced by 4400 tons of CO₂.
4. Increased personnel involvement, including production personnel, in energy saving processes; the staff became more responsible about energy use.
5. It became clear that energy efficiency can substantially lower production costs and also enables to manage these costs.
6. EnMS instruments enabled the enterprise to evaluate new implemented projects on production modernization.

¹ By 2015 tariffs.

7. The amount of implemented energy saving measures has increased (especially of those with low payback time), their implementation period has shortened.
8. Teplichnoe gained the third place in the Second All-Russia contest of implemented projects in energy saving, EE increase and energy sector development ENES - 2015”.

Conclusions

Development, implementation and maintenance of EnMS enabled to shift to managing energy on the basis of system approach. In result, Teplichnoe has built a strong system aimed at constant EE increase. At the same time, reduction of energy costs, possibility to manage production costs, and other non-energy benefits positively impact the overall competence of the enterprise.

Moreover, growth of staff awareness regarding more rational energy use and effective internal communication provided for substantial increase in personnel motivation and their commitment to change. Understanding that everyone contributes to energy efficiency increase of the enterprise changes people's attitudes to work, makes it more productive.