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Improving Planning, Operational Management and Accountability for Energy Consumption in Uzbekistan's Industrial Plants

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ABSTRACT: This article discusses the relationship between technological and energy production regimes, the main components of electricity costs, energy efficiency management methods, and others.

KEYWORDS: analysis and planning of electricity consumption, technological equipment, energy efficiency, mathematical patterns, improving of electric energy efficiency, modes of operation, mathematical modeling, “point” planning, "regional" planning.

I.INTRODUCTION

To improve the level of analysis and planning of electricity consumption, it is necessary to establish the relationship between technological and energy modes of production processes.

In many cases, the best modes of electricity are the maximum capacity of the technological equipment with minimal unit energy costs. Therefore, the intensification of production processes and the improvement of their organization almost always contribute to the savings of electricity. In this sense, the unit consumption of electricity is a general indicator of the feasibility study of production as a whole.

In the changing working conditions of industrial enterprises, electricity consumption analysis to estimate electricity costs is an important link in energy efficiency. In order to study and plan electricity consumption, to develop a method of rationing the consumption of electricity, it is necessary to establish the energy intensity of the processes of the main energy-consuming equipment.

II.ENERGY EFFICIENCY

The main consumers of electric power engineering plants (NMP) are turning, milling and other machines. Establishing and using energy characteristics is a time-consuming task due to the large number of machines and mechanisms with different design features and modes of operation. Therefore, for the analysis and planning of electricity consumption it is advisable to determine patterns of electricity consumption in general on the workshops and plants. In order to make practical use of energy characteristics, it is necessary to consider the indicator that characterizes the production process in conjunction with the indicators of electricity consumption.

Electricity consumption consists of two components: a constant, independent of the size of output, and a variable, in the first approximation of a directly proportional output. Therefore, energy characteristics that express the dependence of electricity consumption on the quantity of output play an important role in the analysis and rationing of electricity consumption. In order to increase the level of planning, a study of electricity consumption in the conditions of the Navoi machine-building plant has been carried out. The analysis of the unit costs of electricity was carried out using correlation analysis methods. The results of the analysis should be used to quantify the impact of production and technological factors on changes in unit electricity costs. The reliability of mathematical patterns of electricity consumption was assessed by the compliance ratio, which represents the ratio of the actual unit electricity consumption in the reporting year to the specific electricity consumption calculated by the resulting model of electricity consumption.

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When planning electricity consumption for the future, it is necessary to take into account the change in the specific consumption of electricity when carrying out measures to save electricity.

III.RESULTS AND DISCUSSIONS

As a result of processing data on electricity consumption and production volumes, a model of specific electricity consumption for the "Stanco-building" workshop has been obtained, which has the expression:

$$\omega = 0{,}87 - 3{,}73 \times 10^{-6} Q \qquad (1)$$

where ω - specific electricity consumption, kWh/pcs;

Q - the volume of production, thousands of pcs.

Currently, the planning of electricity consumption is carried out according to the approved rate of specific consumption of electricity, which does not take into account the change in unit electricity consumption when the volume of production in the reporting period is deviated from the planned period.

The approved planned standard for the development of the "Machine-building" workshop is shown in Figure 1 straight 1 - $\omega = 0{,}78 kWt*h/\ pcs$ - "point" planning.

It is more appropriate to plan the rate of electricity consumption depending on the volume of production in accordance with the energy characteristic shown in Figure 1 direct 2 - $\omega = 0{,}87 - 3{,}73 \times 10^{-6} Q$ - "regional" planning.

As a result of the production program during the reporting period, production volumes have a certain variability and may not always coincide with the planned, so the normative unit consumption of electricity should be adjusted.

Thus, in this example, with the planned volume of products, the existing planned rate of specific electricity consumption $\omega = 0{,}78 kWt*h/\ pcs$ (point B).

As a result of the production program, amounted to 27,000 pie. (point E). In this case, the normative planned specific unit of electricity consumption should be adjusted (point D $\omega = 0{,}775 kWt*h/\ pcs$). Actual specific electrical consumption can be value corresponding to points F_1, F_2, F_3.

In the actual specific electricity consumption F_1, the plan for electricity consumption has not been fulfilled. In actual specific electricity consumption F_2, there is a savings of electricity against the planned "point" estimates (point F). However, taking into account the existing pattern of reducing unit electricity consumption when production increases, rationed unit electricity consumption should be adjusted (point D) and thus actually overspent Electricity. And only in electricity consumption, the corresponding point F_3 there is a reliable saving of electricity.

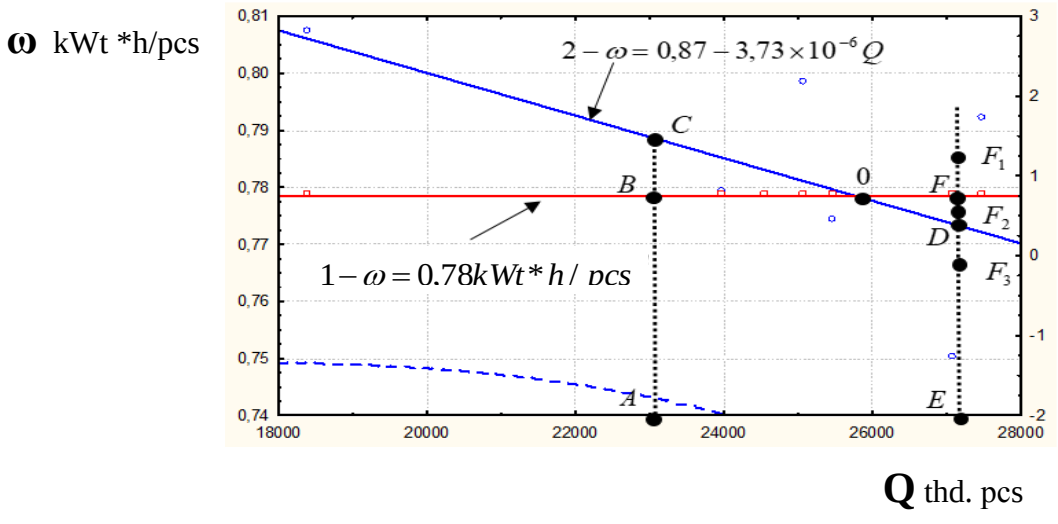

Figure 1 - Scheme of planning and reporting for electricity consumption by "point" (direct 1) and "regional" (direct 2) estimates

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Similar reasoning and appropriate estimates can be made if actual production volumes for the reporting period are less than planned. In this case, for reliable analysis, the planned standards of electricity consumption should be adjusted upwards compared to the planned "point" planning.

Thus, the planning of electricity consumption, taking into account the impact on the electricity consumption of products, leads to an increase in the accuracy of planning and accountability for electricity consumption, which in turn will provide a more adequate analysis electricity consumption and measures taken to improve energy efficiency.

Increased operational management of electricity consumption should be achieved through management actions based on estimates of deviations of actual electricity consumption and planned using the report's findings. energy characteristics.

This deviation is formed on a technological and temporal scale:

- On the basis of the actual monthly unit electricity consumption and the planned monthly consumption established by the energy characteristics of the plant.

These management actions allow to increase the level of operational management of electricity consumption both on a temporary (month) and on an organizational and technical scale.

IV. CONCLUSION

Improving the level of accountability for electricity consumption should, on the one hand, improve the accuracy, timeliness and reliability of reports, on the other hand, increase staff motivation through a more adequate assessment by management efforts to ensure efficient use of electricity.

The accuracy, timeliness and reliability of reports is enhanced by:

- A higher level of planning based on developed energy characteristics and recommendations,
- Adapting to changes in production (organizational, technological and temporal structuring),
- Increase in the level of operational management of electricity consumption (systematic formation and evaluation of deviations of actual and planned unit consumption of electricity).

The implementation of the proposed recommendations improves the conditions for a more adequate assessment by management of staff efforts towards efficient use of electricity.

REFERENCES

1. Oleynikov V.K., Nikiforov G.V. Analysis and management of electricity consumption at metallurgical enterprises. The tutorial is Magnitogorsk. 1999. - 220 p.

2. Karshibayev A.I. Management of Electricity consumption in mining enterprises. The Scientific, Technical and Production Journal of the “Gorniy Vestnik of Uzbekistan”.
Navoi, 2009. No.4. p.77.