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IMPROVING ACCOUNTING OF EXPENDITURES AT PRODUCING ELECTRICAL POWER

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Abstract. This article is devoted to the research of the structure of expenses incurred when producing electrical power, their grouping and accounting in terms of theoretcial and prcatical aspects. In addition, the article provides scientific proposals and practical recommendations aimed at improving accounting of expenditures when producing electrical energy.

Key words: production prime-cost, accounting, production, expenditures, material expenditures, electrical power.

Introduction. The globalization of the world economy and consequent integration of countries create a strong competitive environment, which necessitates expansion of industrial production, services sector, expansion of utilities, as well asraising the volume of agricultural production and ensuring efficient use of resources for agricultural production. The current economic development requires enhanced volumes of production, service and work, as well providing their high quality at relatively low prices. In conditions of limited economic resources it is important to organize efficient use of natural resources without reducing the volume of their use.

In this regard, to ensure further development of our country in 2017-2021, such issues as deepening of structural transformations, with the aim of raising competitiveness of the national economy due to modernization and diversification of key economic sectors reducing spending of resources and energy power, wide application of energy-economizing technologies in the production process, expanding the use of renewable sources of energy, as well as enhancing labor productivity in the economic sector have become crucially important (Decree, 2017)

Almost 90 percent uses natural gas in the process of generating electrical power in our country. To economize electrical power it is recommended to efficiently utilize available natural reserves, not to damage the environment, use advanced saving technologies, in particular, renewable sources of energy.

At the same time, implementation of investment projects in the electrical power industry and determining their effectiveness are currently considered to be the issues of prior importance. This, in turn, requires the calculation of production costs in electrical power generation and the procedure for calculating their prime-cost.

Literature review. The costs associated with generating elecal power, their classification and accounting are considered to be a comprehensive process because, depending on the tools and technological processes used to generate electrical power, the expenditures associated thereto are quite different.

The International Atomic Energy Agency has divided the expenditures of generating electrical power into three phases. They are the following:

expenditures of extraction and supply of resources used to generate electrical power;

expenditures related to electrical power generation;

social expenditures associated with the supply of electrical power and the external environment (World energy outlook, 2018)

An Indian scientist, Sanjiban Bandyopadhyaya, has conducted a study devoted to the expenses on electrical power generation based on the complexity of the electricity production process and the need to account for each production process as a separate accounting object. In his research paper he focuses on the differences in the prime-cost of electrical power generated and prime-cost of the electrical power unit delivered to the consumer (Sanjiban, 2015)

Our domestic scientists B.Khasanov and A.Pardayev have developed numerous educational aids and scientific developments on the issues of accounting of expenditures and prime-costs in which they researched these issues in terms of analytical analysis (Khasanov, 2003)

In his study packs A.Pardaev investigated production costs, their grouping, expenditures hich are included or not included in prime-cost of products, direct and indirect costs. In addition, he studied advanced foreign experience regarding accounting of expenditures (Pardaev, 2002)

However, production costs and peculiarities of their accounting have not yet been studied as a case-study of electrical power generating companies. Electrical power generation is considered to be a comprehensive process, and in this regard it is crucially important to do research on the structure of expenses and peculiarities of their accounting.

Analysis and results

All the expenditures related to the production process are regulated by the "Rules on the structure of sales expenditures of goods (works, services) and the procedure of formulating financial results" approved by the Cabinet of Ministers of the Republic of Uzbekistan. According to this statutory document, expenditures are divided into expenditures included in the production prime-cost and period expenses.[7]

Expenditures related to prime-cost of goods (works, services) by their are grouped by the following elements in reliance upon their economic essence:

production tangible expenditures (with the deduction of the cost of recoverable waste);

labor costs of production nature;

deductions of social insurance related to production;

depreciation of fixed assets and intangible assets which are not significant in terms of production;

other expenditures important in terms of production.

The production process itself, as well as the process of calculating the production costs in the electrical power industry has its own peculiarities. Electrical power production is characterized by integrated use of fuel for heat and electricity generation, which requires the distribution of fuels between these types of products.

The process of acquiring electrical power is characterized by the conversion of one type of energy into another: the combustion of coal, fuel, gas and oil products produces mechanical heat energy, and then electrical power.

The continuous link between production and energy consumption, comparing the production process with the consumption process, enables to refer all production costs directly into energy. For this reason, there is no need to distribute costs between manufactured finished products and unfinished production.

In addition to the overall prime-cost of production, the total cost of production includes the cost of delivery to the consumer. The overall cost of total energy is determined by the terms of the free consumer. The overall cost of energy is the sum of the cost of energy production at power plants, the cost of transmission, distribution and storage of energy facilities in heating and electricity networks.

The electrical power generation processes at the power plant will end with the release of electricity from the workshops and heat generation from the station's collectors. Transmission and distribution of electrical power requires conversion from high voltage (transformer) substations to low voltage (low voltage transforming) substations, which do not reflect losses caused by the technological loss of electrical power during the transmission process.

In the energy sector, simple and similar products are manufactured and this fact enables using simple process-based cost accounting methods and production costs calculation. It is calculated by dividing the electrical power generated by the power plants, rather than the energy supplied to the grid, that is, the total energy used for their own needs.

A distinctive feature of energy production is that production costs affect the cost structure and the classification of cost elements. The largest share in the energy prices is occupied by fuel used for technological purposes. Significant capacities of thermal power networks determine high depreciation in energy prices. Power systems provide consumers with both the electrical power generated by their own power plants and the energy they buy. In this regard, "Energy purchased" has been introduced in the classification, which, in turn, makes accounting more complicated and requires payments of the electrical power purchased.

The products of electrical energy enterprises are not made up of separate components and complexes, and semi-finished products and components are not required for the production. Therefore such items as "Raw materials and consumables", "Recoverable waste", "Purchased products and semi-finished products" are not included in classification. The procedure for calculating the prime-cost will make an impact on the type of products manufactured. Some power plants produce one type of product (electrical power) and other plants (produce two types (electrical power and thermal energy). In the first case, all production costs are electrical power costs, and at the second plant they are divided by two types. (Figure 1)

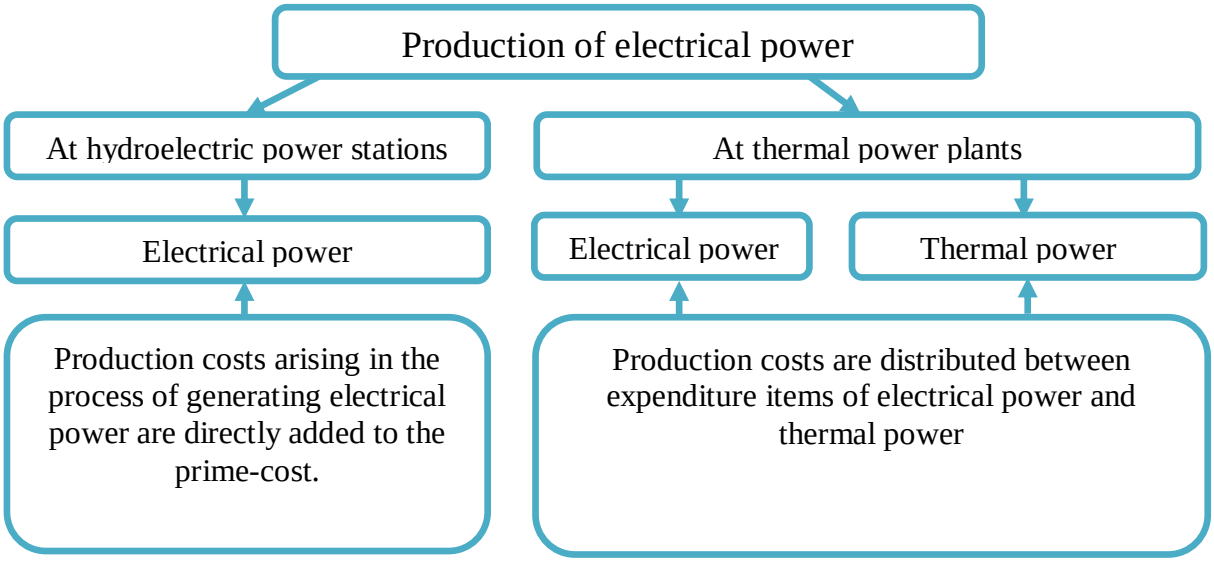

Figure 1. Distribution of costs when generating electrical power.[1]

Energy production consists of stages of a unified technological process. Each stage of production is subject to basic production costs.

[1] Developed by the author.

Objects of calculations in the energy sector: power plants - production of electrical power and heating power, as well as the value of transmission and distribution of energy for electricity and heating systems (Figure 2).

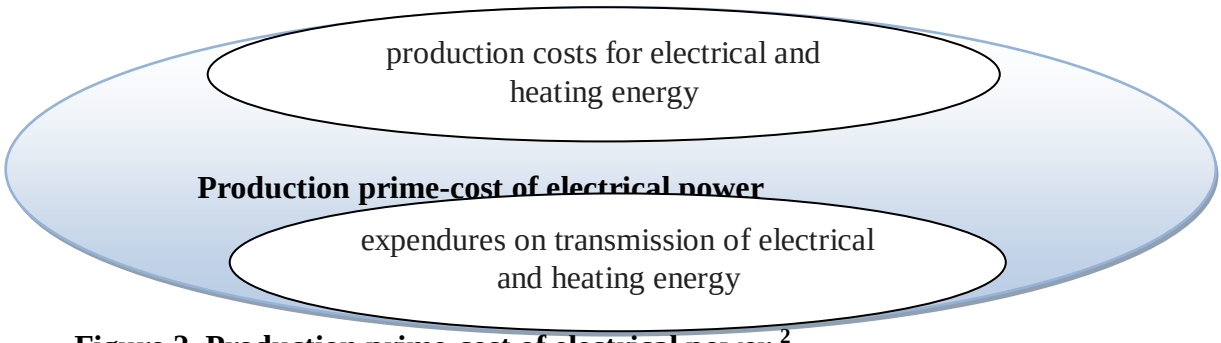

Figure 2. Production prime-cost of electrical power.[2]

To measure and calculate the energy the following units are used:

at the power plants – prime-cost of 1 kilowatt hour of electricity transmitted through the plant's facilities and 1 Gcal of thermal energy issued from plant's collectors;

at the electricity and heating systems – cost of 1 kilowatt of the electical energy transmission and distribution and 1 Gcal of the thermal energy.

Calculation, transmission and distribution of electrical power and thermal energy is implemented in accordance with industry guidelines by the following calculations:

fuel for technological purposes;

water for technological purposes;

wages of workers engaged in the production process;

taxes, charges and incentives imposed to the wages of workers;

expenditures on saving and maintenace of equipment and machinery, including, but not limited to, depreciation of production equipment, repair of networks and equipment used by utilities;

expanditures on the production development, as well as production costs;

expenditures of the general economic unit;

overall expenditures (expenditures of the plant);

electrical power purchased.

Calculation, transmission and distribution of electrical power in the process of its production is implemented on the basis of the source documents compiled in the special design tables prepared by the distribution system or an enterprise as a whole. The data collected at the end of the month will be transferred to the total costs of 12-E "Actual expenditures for the main production units" and total management costs for the enterprises of the energy sector.

When electrical power is delivered to consumers, the costs of the following factors are taken into account and summarized: high and low voltage power lines, substations, including transformers, and underground cable lines.

Expenditures on transmission and distribution of the thermal power are made without dividing them into calculation stages. Expenditures on transmission and distribution of the thermal power include the following: expenses on operation of heating networks and boilers, composition of control room, repair of heating pipes and other equipment of heating networks, other expenses related to salaries and taxes.

Grouping of expenditures by calculation elements in electrical and heating systems is implemented in the similar way. There are no items "Heating for technological purposes" in the network system which delivers thermal power and "Water for

[2] Developed by the author.

technological purposes" in the electrical grid. According to item "Expenditures on saving and maintenance of equipment in electrical grids and thermal system networks" not expenditures related to the equipment, but expenditures on preserving and maintaining electricity transmission lines and thermal systems, that is depreciation of the machinery and equipment should be taken into account.

The accounting registers summarize the overall expenditures and divide them into the production costs of generating electrical power and thermal energy. Power plant use a simplified method of calculation and expenditures are accrued step-by-step. The distictive feature is that preliminary expenditures of workshops (production stages) are not accounted for the next stages.

The next stage of the calculation activities includes distribution of expenditures on the actual costs of certain types of electrical power and thermal power. Meanwhile, accurate distribution of expenses by each element is a crucially important aspect.

Expenditures between the types of energy are divided according to the degree of involvement of the plant in production of two types of energy. The costs of two types of energy production workshops are proportional to the proportion of fuel consumed for producing electrical power and thermal energy. This distribution method is called "natural" or "physical". Conventional fuel consumption by types of energy is determined by the station's technical facilities. In addition, expenditures are modified and improved: the cost of the electrical power reduces and heating expenditures raise the cost of fuel used in boilers for production needs. General economic expenditures are proportionally distributed between types of energy and the purchase cost of energy in the process of the main production. In order to receive production costs of electrical energy and thermal power, appropriate share of general expenditures are added to their economic expenditures.

In order to determine the price of 1 kilowatt/hour of the electrical power at the power station, its production costs are divided into the amount of energy transmitted by the power plant facilities. Expenditures spent on the thermal energy are distributed by the amount of Gcal of the thermal energy produced by the power plant collectors. In reliance upon the data obtained, calculations are made on the monthly basis. To ensure a smooth process of production, the total cost of the electrical and thermal powers at the production associations is determined and calculated for free consumers. In this regard, in electrical power systems calculation of five values is implemented:

a) at the power plants – calculating production costs of electrical power and thermal power;

b) in electricity grids:

expenditures related to the transmission of the electrical power;

expenditures made on distribution of electrical power.

c) in heating systems:

calculating delivery of the thermal energy and distribution cost.

d) at the energy-producing plants:

Totality of expenditures on the electrical energy production, supervision, sales and the energy purcahsed, including plants producing electrical power is considered to be an overall cost.

Conclusion and proposals. Summing up the research results it is possible to make a conclusion that the process of producing electrical energy is considered to be rather complicated process. Moreover, determination of the expenditures related to the production, their grouping and accurate revealing in the prime-cost of the product can make an impact on the prime-cost of the electrical power and financial results of the

enterprise. Moreover, it is advisable to undertake the following measures aimed at accounting of expenditures when producing electrical power:

to avoid fixed expenses which cause the increase of the prime-cost of the product when producing electrical power, it is recommended to launch the method of calculating depreciation in releance upon depreciation method;

to determine a certain procedure for distributing expenditures related to the production of the electrical power at the power stations. Herewith it is required to precisely set the proportion for distributing expenditures at the thermal power stations between electrical power and thermal power.

The electrical power production sector is of particular importance in the development of all sectors and industries of the economy. Enterprises in this sector require constant improvement in terms of the structure of production costs and their accounting.

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