TASHKENT STATE UNIVERSITY OF ECONOMICS

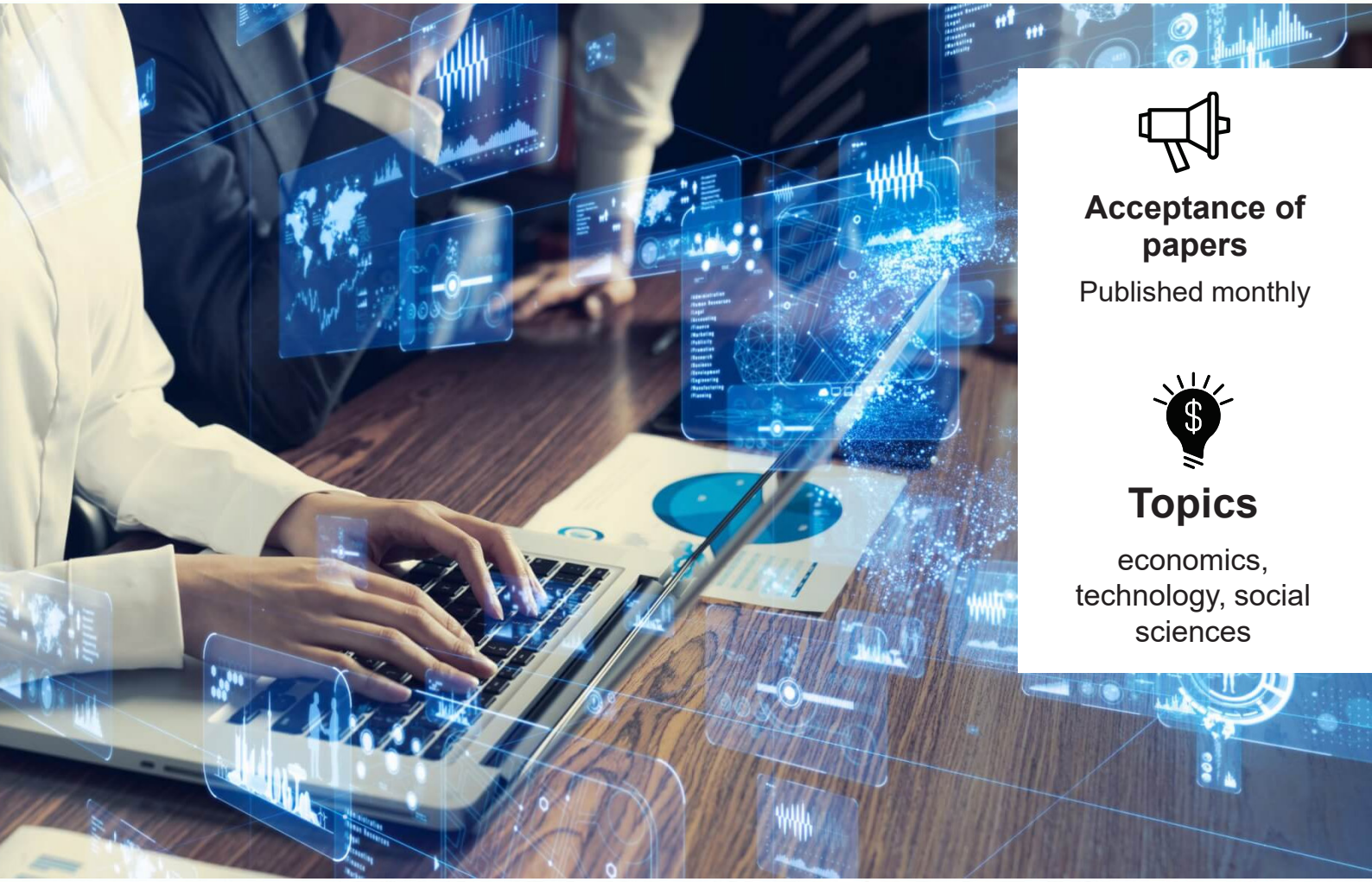
International journal of topics

INNOVATION SCIENCE AND TECHNOLOGY

Scopus || Electronic journal specializing in Scopus

ISSUE 7

Acceptance of papers **July, 2025**



Acceptance of papers

Published monthly

Topics

economics, technology, social sciences

ISSN 3060-5229

Electronic publication, Issue 7. 34 pages.
Approved for publication on July 1, 2025.

THE SCIENTIFIC-POPULAR ELECTRONIC JOURNAL **"INNOVATION SCIENCE AND TECHNOLOGY"** HAS BEEN REGISTERED UNDER THE NUMBER **C-5669633** BY THE AGENCY FOR INFORMATION AND MASS COMMUNICATIONS (AOKA) OF THE REPUBLIC OF UZBEKISTAN, EFFECTIVE FROM OCTOBER 9, 2024.

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The scientific electronic journal “Innovation Science and Technology” has been included in the list of scientific publications recommended for the publication of main scientific results of dissertations for the award of PhD and DSc degrees in economics and technical sciences, in accordance with the Resolution No. 370 of the Presidium of the Higher Attestation Commission of the Republic of Uzbekistan, dated May 8, 2025.

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CALCULATION OF STANDARDIZED ELECTRICITY LOSSES

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Abstract: The main activity of organizations of electric networks is the supply of electric energy from manufacturers to consumers. Like any other transport, electricity transmission is associated with a loss of resources. Grid organizations are required to compensate for electricity losses by purchasing a certain amount of electricity. Electricity losses can occur in the form of the establishment or out-of-contract establishment, not counting technological losses as well as losses associated with electricity theft. This article contains the procedure for accounting for electricity losses by power grid organizations.

Key words: total power losses, process losses, technical losses, notional permanent losses, process loss standards.

INTRODUCTION

The main objectives of our research are to develop a unified economically justified approach to accounting for electricity losses in the accounting systems of power grid organizations during the transmission of electricity through power networks. Total electricity losses are defined as the difference between the volume of electricity delivered to the power grid from other networks or producers and the volume of electricity consumed by devices connected to the grid and transferred to other network organizations.

Technological losses of electricity include the physical processes that occur during the transmission of electricity in accordance with the technical characteristics and operating modes of the lines and equipment. These include technical losses in power lines and equipment, as well as losses caused by allowable errors in the electricity metering system.

REVIEW OF LITERATURE ON THE SUBJECT

A number of local scholars have conducted scientific research on the accounting of electricity losses. In his article titled “Issues of Preparing Financial Reports Based on IFRS in Enterprises of the Power Grid Sector,” Karimjon Bakidjanovich Akhmedjanov outlines his views on improving accounting practices in power grid enterprises [8]. In the article “Specifics of Accounting for Electricity Losses” by A. A. Majajikhov, it is recommended to treat electricity as a separate accounting object and to open a new analytical account for this purpose [9]. Russian scholar V. D. Kalner, in his scientific work “Green Economy and Non-Alternative Natural Resources,” presents his views on accounting and analyzing electricity losses during transmission. He emphasizes reducing the volume and types of losses through the use of alternative energy sources and radically reforming the metering system [7].

RESEARCH METHODOLOGY

The article employs methods such as data grouping, analysis and synthesis, system analysis, comparison, comprehensive assessment, and forecasting techniques.

ANALYSIS AND RESULTS

During the standardization and accounting of electricity losses, discrepancies either positive or negative, may arise. A positive discrepancy refers to the reduction in actual losses as a result of the efforts made by regional power grid companies. In such a case, the company must reflect the saved amount in accounting records, derecognize the cost of the saved electricity, and recognize the resulting income.

When electricity is transmitted through power grids, the amount of technological losses within approved standards, calculated at the purchase price of the received electricity, is charged to period expenses and recorded in accounting as follows:

Debit: 9410 – «Selling Expenses»

Credit: 2990 – «Other Goods»

The difference between the volume of electricity delivered to consumers by the regional power grid company and the volume received by the same company within a given period, after deducting the losses within approved transmission norms, must be recorded in the accounting ledgers. In short, the difference between purchased and sold electricity represents the standardized loss amount, and it is recorded as:

Debit: 2990 – «Other Goods»

Credit: 1610 – "Accounts Reflecting Differences in Material Value"

During monthly calculations, the excess volume of electricity received compared to what was supplied to consumers must be accounted for separately by the regional power grid enterprise. This indicates that the amount of electricity losses has exceeded standardized limits. These differences are calculated at the electricity purchase price and recorded as follows:

Debit: 1600 – "Accounts Reflecting Differences in Material Value"

Credit: 2990 – «Other Goods»

Thus, the difference in the volume of electricity that was delivered to consumers but not recorded in account 2990, or that was recorded but lost due to excessive losses, must be reconciled in the accounting system as described above. At the end of the reporting year, the balance in the account "1600 – Accounts Reflecting Differences in Material Value" must be written off in accordance with established procedures. To do this, it is necessary to determine on which side of the account the balance remains. If the balance is on the debit side, it is written off with a corresponding entry to:

Debit: 9430 – «Other Operating Expenses»

Credit: 1600 – "Accounts Reflecting Differences in Material Value"

This indicates that the difference in material value is negative.

Another concealed issue also needs clarification as a result of these accounting operations. The identified negative discrepancy relates to electricity that was recorded as delivered to consumers but was in fact not delivered. Therefore, value-added tax (VAT) had previously been calculated on this lost electricity. An adjustment entry for the VAT amount corresponding to the excess losses is made as follows:

Debit: 9430 – «Other Operating Expenses»

Credit: 4410 – "Accounts for Budget Settlements"

In this way, the discrepancies resulting from excessive electricity losses are eliminated. Conversely, if the balance of account 1600 – "Accounts Reflecting Differences in Material Value" is on the credit side, it indicates that the actual electricity losses are lower than the standardized amount. Naturally, this results in an increase in the company's income.

When the amount of electricity losses is found to be below the approved norm, the corresponding amount is written off in the following order:

Debit: 1600 – "Accounts Reflecting Differences in Material Value"

Credit: 9390 – «Other Operating Income»

If the electricity tariffs per 1 kWh set for regional power grid companies change, the company must notify consumers through mass media in accordance with the procedure established by law. A change in electricity tariffs does not constitute grounds for terminating the bilateral agreement. The electricity supply contract remains valid.

All consumers are obliged to conduct payment settlements based on the new tariff starting from the date the electricity tariff changes. In cases of outstanding debt due to various reasons, such as loan payments, lack of funds, etc. The unpaid electricity consumption amounts recorded before the tariff change date shall be settled using the old tariff rates.

The sale of electricity consumed by consumers from the date the new tariffs take effect is recorded in the accounting system as follows:

Debit: 4010 – "Receivables from Buyers and Customers"

Credit: 9020 – "Revenue from Sale of Goods"

Credit: 6410 – "Liabilities for Payments to the Budget" (for the amount of value-added tax calculated on the electricity sold)

If the actual amount of electricity sold based on the new tariffs exceeds the amount of advance payments previously received under the old tariffs from households, the excess portion is accounted for as follows:

Debit: 4010 – “Receivables from Buyers and Customers”

Credit: 9020 – “Revenue from Sale of Goods” – for the difference between the electricity sales amount under the new tariffs and the amount of advances received from households under the old tariffs

Credit: 6410 – “Liabilities for Payments to the Budget” – for the amount of VAT calculated based on the electricity sold

The cost of electricity sold from the date the new tariffs take effect is recorded in the books of the regional power grid company as follows:

Debit: 9120 – “Cost of Goods Sold”

Credit: 2990 – «Other Goods»

Over the past eight years, electricity production has increased by 38%, reaching 81.5 billion kilowatt-hours. Due to expanded opportunities for the private sector, an additional 11.2 gigawatts of capacity has been created. As a result, the private sector’s share in total electricity generation has reached 24%, while the share of “green” energy now accounts for 16%.

During this period, household incomes increased by 1.6 times, and the growing use of modern household appliances led to household electricity consumption exceeding 21 billion kilowatt-hours, which is twice as much as in 2016. By 2030, the population of our country is expected to reach 41 million, and the economy is projected to grow by 1.5 times.

Accordingly, the goal is to create added value of 45 billion USD in the industrial sector, triple the volume of services, and launch large-scale data centers. To achieve this, a stable electricity supply is essential.

According to calculations, electricity demand will reach 117 billion kilowatt-hours in 2030 and 135 billion kilowatt-hours in 2035—1.7 times more than the current level. As stated, new power plants and energy storage facilities will be constructed. To integrate them into the system, 7,000 kilometers of transmission networks will be built and a digital management system will be introduced. This will ensure regional energy balance. If one region faces a power shortage, additional capacity from another region will be activated.

To implement these plans, an investment of 4 billion USD will be required over the next five years for “National Electric Networks of Uzbekistan”.

Another critical issue is reducing the cost price of electricity. The key factor in achieving this lies in expanding the use of alternative energy sources. Foreign experts have also highlighted Uzbekistan’s significant potential for “green” energy development. Based on this, it is planned to increase the share of green energy in total generation to over 50% by 2030. In particular, it is envisaged to launch 164 megawatts of capacity from 3,000 micro hydropower stations and 750 megawatts from solar and wind energy installations.

Specifically, in the industrial sector, there is an opportunity to generate an additional 27% of GDP through improved energy efficiency. Currently, energy consumption in some domestic chemical and metallurgical enterprises is twice the global average, while cement production consumes 1.2 times more energy. Therefore, reducing energy consumption by 10–15% in each industry and cutting electricity losses from the current 14% down to 8–9% by 2030 has been identified as a strategic goal.

Projects totaling $26 billion with a combined capacity of 24 gigawatts are being launched in cooperation with foreign investors. These projects require a large volume of equipment and construction materials, which represents a major opportunity for domestic enterprises. The importance of localization and development of industrial cooperation within these projects was emphasized. In addition, tasks were set for ensuring stable and uninterrupted electricity supply to consumers and for strengthening personnel training in the sector. Officials were instructed to take all these factors into account when developing a comprehensive development program for the electric power sector until 2035.

CONCLUSIONS AND SUGGESTIONS

Based on the presented evidence, the analytical accounting of the newly introduced “Electricity Losses” account should be carried out in accordance with the classification of losses by type. The recommended methodology for accounting electricity losses using the “Electricity Losses” account is justified for the following reasons:

First, it is appropriate, as it enables the clear identification of this accounting object in order to provide more accurate and systematic data in accounting records;

Second, it systematically links the types of electricity losses into a coherent structure, which helps generate accounting indicators required for a logical and efficient management system;

Third, the approach of categorizing losses by type implies that each type will have its own procedure for analytical accounting, thereby ensuring transparency, traceability, and control over electricity losses.

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Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2025. № 7

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