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STATE AUDIT OF THE EFFICIENT USE OF BUDGET FUNDS IN THE ENERGY SECTOR AND ISSUES OF TRANSITION TO RENEWABLE ENERGY

Abstract: This research article explores the methodological and institutional foundations of state audit in assessing and promoting the efficient use of budget funds allocated for the development of renewable energy sources (RES) in the Republic of Kazakhstan. The relevance of the study is driven by the country's commitment to achieving carbon neutrality by 2060 and the increasing scale of public and international investments in the green energy sector. The aim of the research is to analyze the extent to which current audit mechanisms contribute to transparency, accountability, and performance in the implementation of budget-supported RES projects. The study employs content analysis of legal acts, statistical evaluation of public expenditure (2018–2024), and comparative review of international practices. Special attention is paid to the structure of RES financing, including the 70/30 capital ratio, investment preferences, and regulatory measures. The findings show that while Kazakhstan has made progress in expanding its renewable energy capacity, weaknesses persist in audit methodology, particularly in assessing environmental and economic effectiveness. The article proposes integrating climate performance indicators into audit practices. The scientific contribution lies in the development of an analytical framework for sustainability-oriented public audit. Practical outcomes include recommendations for improving the fiscal oversight of RES programs, bringing audit tools in line with global standards, and ensuring efficient allocation of funds in support of Kazakhstan's energy transition strategy.

Keywords: state audit, energy sector, budget efficiency, renewable energy, public expenditure, energy transition, sustainable development, audit evaluation, green energy, government control

INTRODUCTION

In recent years, the transition to renewable energy sources (RES) has become a strategic priority for countries aiming to ensure energy security, mitigate climate change, and promote sustainable economic development. Kazakhstan, possessing vast renewable energy potential, has taken significant steps to modernize its energy sector and reduce dependence on fossil fuels. The urgency of optimizing the use of public funds in this domain has brought state audit practices to the forefront, especially as the country moves towards integrating sustainability principles in public financial management.

The relevance of this study is underscored by recent legislative developments. On June 19, 2024, President Kassym-Jomart Tokayev signed the Law "On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Supporting the Use of Renewable Energy Sources and Electricity," aimed at improving mechanisms for supporting the development of the energy sector[1]. Among the key provisions are the promotion of small-scale renewable energy systems (up to 200 kW), guaranteed electricity buy-back at regulated prices, and credit-based support for the modernization of municipal power grids using state budget funds. These reforms reflect a growing demand for transparency and efficiency in the allocation and monitoring of budgetary resources, making the role of state audit institutions especially critical.

Despite increasing policy attention, the effective implementation of budget-supported renewable energy initiatives continues to face challenges, including fragmented oversight, insufficient audit methodologies tailored to the green economy, and underdeveloped mechanisms

for evaluating efficiency. Thus, the topic of this research remains insufficiently explored and calls for a more structured scientific approach.

The object of this study is the public management of budget expenditures in the energy sector, while the subject is the methodological and institutional aspects of state audit as a tool for evaluating the efficiency of public spending on renewable energy development. The aim of the study is to substantiate the role of state audit in ensuring the targeted and efficient use of budget funds allocated for energy modernization and RES promotion. The key tasks include analyzing international audit practices in the energy sector, assessing Kazakhstan's audit framework, and developing recommendations for improving audit methodologies in line with the green transition.

LITERATURE REVIEW

Recent international scholarship has highlighted the increasing importance of state audit institutions (SAIs) in ensuring accountability and efficiency in the use of public funds in the energy sector, especially amid the global shift towards renewable energy. Sułkowski Ł., Dobrowolski Z. emphasized the pivotal role of SAIs in EU countries in promoting public accountability through ex-post audits in energy spending, aligning financial oversight with environmental priorities[2]. Febrianto F. R., Amyar F., Puspitasari R. analyzed the integrated audit approach for state-owned enterprises involved in sustainable energy programs, demonstrating its effectiveness in identifying budget allocation issues and operational risks[3]. Annunziata E., Rizzi F., Frey M explored the role of local audit initiatives in improving energy efficiency in public buildings under constrained budget conditions, suggesting that targeted audits can facilitate better energy governance[4]. Parthan et al., through the lens of the REEEP program, illustrated how donor funding and audit mechanisms influence low-carbon energy transitions in developing countries[5]. In a more recent context, Onuoha et al. investigated the interplay between governance quality, public debt, and renewable energy consumption in Sub-Saharan Africa, showing that efficient public budgeting directly impacts green energy adoption[6]. Su and Hu examined audit risks associated with government subsidies in the new energy vehicle sector in China, emphasizing the importance of proper auditing to prevent misuse of funds [7]. Collectively, these studies underscore the growing relevance of audit frameworks in supporting transparent, effective, and accountable public investment in the energy transition process.

Kazakhstan's scholars have also contributed significantly to the study of effective budget utilization and the development of renewable energy in the context of state audit. S.N. Suyeubayeva and E.V. Varavin analyzed investments in renewable energy sources (RES) as a key instrument for achieving the Sustainable Development Goals in Kazakhstan, highlighting the need to assess the level of RES development in the country[8]. M. Laljebaev, R. Isaev, and A. Saukhimov [9], in their comprehensive report prepared by the University of Central Asia, explored the potential, barriers, and future prospects for RES in Central Asia, emphasizing the necessity of policy modernization due to rapid sectoral changes. A.S. Smagulova and G.K. Kenzhegulova examined the impact of international cooperation on the growth of RES in Kazakhstan, arguing that global partnerships play a pivotal role in accelerating the green energy transition[10]. In a more technology-oriented approach, L. Mergaliyeva and K. Beketova investigated the integration of artificial intelligence into renewable energy systems, stressing the potential for increased efficiency and innovation in Kazakhstan's energy sector[11]. These studies collectively emphasize the importance of modernizing both the energy policy framework and public audit mechanisms to ensure transparency and effective use of budgetary resources.

METHODOLOGY

This study examines the effectiveness of state audit in overseeing the use of budgetary funds for the development of renewable energy in Kazakhstan. The research materials include statistical data (2018–2024) from the Ministry of Finance and Ministry of Energy, audit reports,

and regulatory documents such as the Law “On State Audit and Financial Control” and the 2024 amendments supporting renewable energy.

The main research question is: How effective is state audit in ensuring the efficient use of public funds in the renewable energy sector? The hypothesis is that stronger audit mechanisms, supported by relevant data and legal tools, improve spending efficiency and transparency.

The study consists of three stages: (1) compilation and analysis of laws and audit documentation; (2) processing and analysis of statistical data; (3) evaluation of audit practices. Methods include content analysis of legal acts, comparative analysis of international practices, and descriptive statistics. Tools used include Microsoft Excel and the Adilet legal database. The novelty lies in combining legal and financial analysis to assess the role of audit in Kazakhstan’s energy transition.

FINDING/DISCUSSION

Kazakhstan's commitment to global climate initiatives has significantly shaped the country's energy policy and budgetary priorities in recent years. As a party to the United Nations Framework Convention on Climate Change (UNFCCC) ratified in 1994, Kazakhstan pledged to stabilize greenhouse gas (GHG) concentrations at levels that would prevent dangerous anthropogenic interference with the climate system. The subsequent ratification of the Paris Agreement in 2016 further reinforced Kazakhstan’s responsibilities, particularly in limiting global temperature rise to well below 2°C above pre-industrial levels, with efforts to constrain it to 1.5°C.

In line with these international obligations, Kazakhstan submitted its first Nationally Determined Contributions (NDCs) in 2015, committing to an unconditional reduction of GHG emissions by 15% and a conditional reduction of 25% by 2030 compared to 1990 levels. In 2020, the government declared its long-term ambition to achieve carbon neutrality by 2060, which was formally supported by the adoption of the national Strategy for Carbon Neutrality in 2023.

These milestones underline Kazakhstan’s active integration into the global decarbonization movement. However, the transition to a low-carbon economy requires not only strategic planning but also effective control over public investment in renewable energy. In this context, state audit plays a critical role in evaluating the transparency, efficiency, and impact of budget allocations aimed at achieving climate targets. The next sections will explore how Kazakhstan’s audit institutions respond to these challenges, what tools they use to monitor expenditures in the energy sector, and whether their methodologies align with the sustainability agenda established by national and international frameworks.

Alongside national challenges, it is essential to consider the global context in which Kazakhstan is attempting its energy transition. The renewable energy sector is expanding rapidly worldwide, with total installed capacity reaching 3,372 GW by the end of 2022, according to data from IRENA and REN21 (2023). This represents a remarkable growth trajectory compared to 1,444 GW in 2012—more than doubling over the span of a decade.

In 2022 alone, 83% of all newly added electricity generation capacity globally came from renewable sources, reflecting a decisive shift in investment patterns and energy strategies. Furthermore, 30% of the world’s electricity was generated from renewable energy sources, with solar (PV) and wind power accounting for a significant portion. The share of solar and wind in global electricity production continues to grow steadily, driven by falling technology costs, increased grid integration, and supportive policy frameworks.

This global momentum toward clean energy underscores the importance of Kazakhstan aligning its financial planning and audit mechanisms with international best practices. The accelerating pace of RES deployment highlights a dual responsibility: ensuring that Kazakhstan not only attracts investment into renewable technologies but also that public spending is effectively monitored to maximize returns, both economically and environmentally.

As renewable energy becomes a dominant force in global energy systems, Kazakhstan’s

Supreme Audit Institution and public financial control bodies must evolve accordingly. Auditing strategies should account for climate co-benefits, cost-effectiveness, and policy alignment with global benchmarks, ensuring that Kazakhstan's renewable energy projects deliver on their intended goals and contribute to the broader national strategy for carbon neutrality by 2060.

Kazakhstan's renewable energy sector has demonstrated steady growth and increasing strategic significance over the past decade. As of the end of 2022, the country had commissioned a total installed capacity of 2,527 MW of renewable energy across 133 facilities, reflecting a consistent upward trajectory since 2014, when the installed capacity was only 178 MW across 26 facilities. This growth has been driven by policy incentives, auction mechanisms, and an evolving legal framework aimed at transitioning the national energy system toward low-carbon sources.

According to the Concept for the Development of the Electric Power Industry of the Republic of Kazakhstan for 2023–2029, 6.8 GW of renewable capacity is expected to be commissioned by 2027 through competitive auction schemes. These auctions aim to enhance investment attractiveness and technological competitiveness. By 2022, total investments in renewable energy projects in Kazakhstan reached \$2.2 billion, signaling the country's growing role as a regional hub for clean energy financing.

The structure of RE generation remains diverse, though solar power plants (SPPs) and wind power plants (WPPs) dominate. Out of 130 renewable energy plants recorded by the end of 2022: 74 solar stations generated 1,149 million kWh from 1,763 MW of capacity, 22 wind stations generated 957 million kWh from 934 MW, 44 small hydropower plants generated 280 million kWh from 411 MW, Bioenergy plants play a minor role, producing only 22 million kWh from 46 MW of capacity (Figure 1).

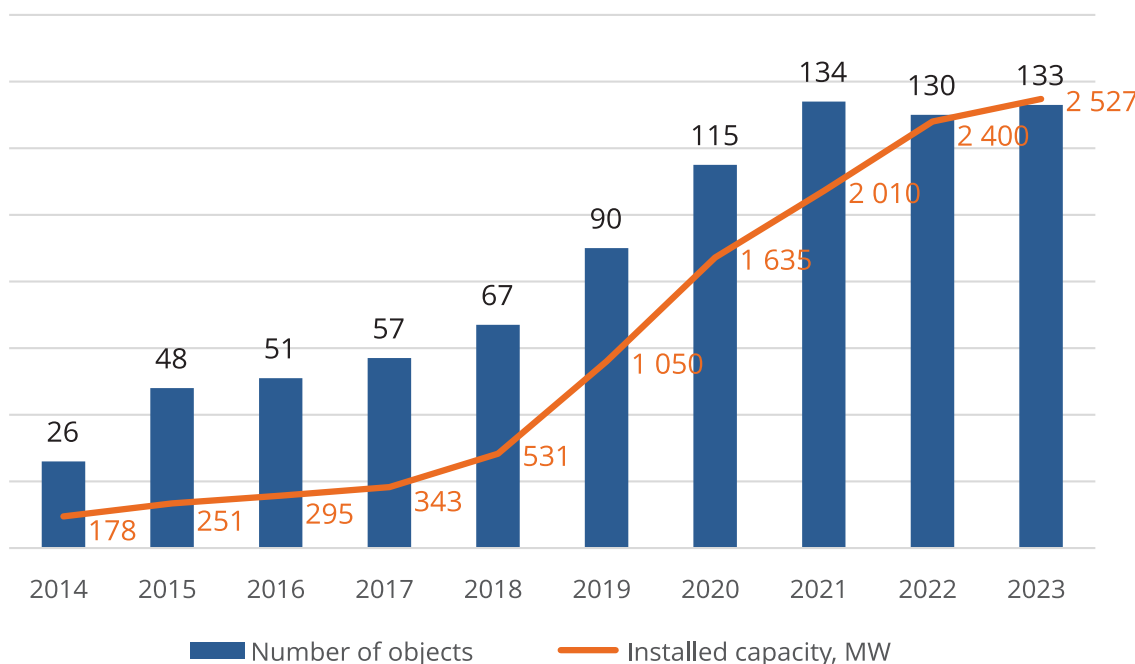


Figure 1. Data on renewable energy facilities in Kazakhstan

Note: compiled on the basis of AIFC data

In total, renewable energy facilities produced 5,108 million kWh of electricity in 2022, accounting for 4.5% of the country's electricity mix. The share of RE in national electricity generation has risen from 0.6% in 2014 to 4.5% in 2022, indicating gradual but persistent decarbonization progress.

Table 1. Types of power plants in Kazakhstan

Type of Power Plant	Number of Plants	Capacity, MW	Electricity Generation, million kWh
Traditional Power Plants (TPPs, CHPPs, GTPPs, HPPs)	74	22,136	107,758
Total RES:	130	2,388	5,108
- Solar Power Plants (SPP)	46	1,149	1,763
- Wind Power Plants (WPP)	44	957	2,411
- Small Hydro Power Plants	37	280	934
- Bioenergy Plants	3	2	0
Total (All Types)	204	24,524	112,866

Note: compiled on the basis of AIFC data

Nevertheless, despite positive trends, the contribution of renewables remains modest relative to traditional thermal and hydroelectric power plants, which continue to account for the majority of generation. As of the end of 2022, Kazakhstan operated 866 traditional power plants with a combined capacity significantly exceeding that of RE facilities. This landscape underscores both the opportunities and challenges facing Kazakhstan's green transition. On the one hand, there is clear momentum in expanding RE capacity and attracting investment. On the other hand, the limited share of renewables in total generation highlights the need for enhanced regulatory frameworks, improved grid infrastructure, and targeted public spending, particularly under state-supported programs. In this context, the role of state audit becomes increasingly important—not only to ensure the transparency and efficiency of budget expenditures but also to verify that the planned capacities translate into real emissions reductions and system-wide benefits.

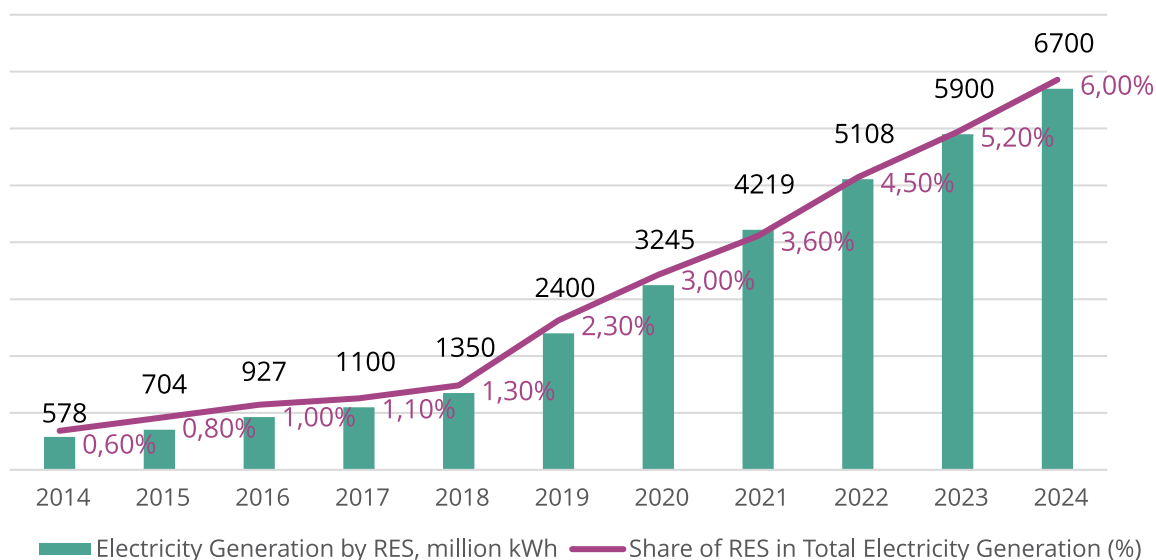


Figure 2. Dynamics of Electricity Generation by Renewable Energy Sources (RES) and Their Share in Total Electricity Production in Kazakhstan, 2014–2024

Note: compiled on the basis of AIFC data

Kazakhstan's integration into global climate commitments, including its target of carbon neutrality by 2060, necessitates a robust alignment between financial planning, project execution, and accountability mechanisms—where audit institutions must evolve to include climate and performance indicators in their evaluation practices.

Kazakhstan possesses vast and diverse renewable energy (RE) resources, offering substantial opportunities for long-term decarbonization and sustainable development. According to the 2022 Investor Guide for the Implementation of Renewable Energy Projects by JSC "KOREM," the Ministry of Energy of the Republic of Kazakhstan, and USAID, the country's technical potential is estimated at 1,000 billion kWh per year for solar energy, 920 billion kWh per year for wind energy, and 166 billion kWh per year for hydropower. Additionally, Kazakhstan has a geothermal heat potential of 4.3 GW from thermal groundwater sources and significant biogas potential derived from agricultural and livestock waste, including grain by-products and manure (Figure 3).



Figure 3. Kazakhstan's Renewable Energy Resource Potential

Note: compiled on the basis of AIFC data

The renewable resource potential varies significantly by region, depending on natural and climatic conditions. The southern regions of Kazakhstan exhibit the highest solar energy potential, with annual sunshine duration ranging from 2,200 to 3,000 hours per year, exceeding the national average. Wind energy potential is especially promising due to the existence of high-speed wind corridors with average wind speeds exceeding 5 m/s, notably in the Caspian region and in the northern and southern parts of Kazakhstan. As for hydropower, resources are geographically distributed, with major basins located in (1) the Irtysh River and its tributaries, (2) the Ili River basin, and (3) the Syr Darya, Talas, and Chu River basins.

This abundance of renewable energy resources underpins Kazakhstan's strategic shift toward a greener energy matrix and enhances its capacity to meet national and international climate commitments, including its target of carbon neutrality by 2060. Unlocking this potential requires not only favorable investment conditions and supportive legislation but also the establishment of rigorous oversight of project implementation and public financing through state audit mechanisms.

In addition to auction mechanisms and strategic policy initiatives, Kazakhstan provides a range of regulatory and financial support instruments to stimulate investment and accelerate the deployment of renewable energy sources (RES). These measures aim to improve the investment climate, reduce entry barriers, and ensure grid integration for renewable energy producers.

Regulatory Measures and Grid Access Privileges

RES producers are exempt from paying transmission service fees for the delivery of electricity generated from renewable sources.

Financial settlement of imbalances arising from RES generation is managed by the Financial Settlement Center for Renewable Energy (FSC).

RES producers are granted priority dispatch for the transmission of electricity to the grid.

Transmission system operators cannot refuse grid connection to a RES facility on the grounds of grid unpreparedness.

Costs for grid reconstruction or expansion required to accommodate RES projects are borne by the transmission company.

Additionally, for auction-based project selection, land plots and grid connection points are pre-allocated to facilitate project implementation.

Since 2016, renewable energy projects have been included in the list of investment projects eligible for state support under the Law of the Republic of Kazakhstan "On Investments." To obtain investment preferences, the following steps are required:

Submit an application to the Investment Committee under the Ministry of Foreign Affairs of the Republic of Kazakhstan.

Conclude an investment contract with the Investment Committee.

The available investment incentives include:

- Exemption from customs duties on imported equipment and components.
- Exemption from VAT on imports.
- Provision of in-kind state grants (e.g., land, infrastructure).
- Exemption from corporate income tax (CIT).
- Exemption from land tax.
- Exemption from property tax.

These regulatory and investment support measures reflect Kazakhstan's comprehensive approach to promoting renewable energy through both institutional frameworks and fiscal incentives. The effectiveness of these tools depends not only on implementation but also on robust monitoring and auditing mechanisms to ensure transparent use of public resources and alignment with national decarbonization targets.

Financing of renewable energy (RE) projects in Kazakhstan reflects a structured approach involving both private investors and international financial institutions. The most common funding model observed in the country is a 70/30 ratio, where approximately 70% of the capital is provided through debt financing, while 30% is contributed as equity by the project developers or sponsors. This model aligns with global best practices in infrastructure project financing and enables risk-sharing between investors and lenders. Equity financing is typically undertaken by private investors and companies operating in the RE sector, including both domestic and foreign entities.

Among active equity investors are companies specializing in renewable energy (e.g., Universal Energy Ltd., Risen Energy, China Power International Holding Ltd., Next Green Energy from China; Hevel, Evrus LLP (TOO Эврус), Afrik LLP (TOO Африк) from Russia; SOLARNET and DERA GmbH from Germany; Urbasolar SAS from France). In addition, major strategic agreements have been signed with global players such as Aqua Power (Saudi Arabia), Masdar (UAE), SANY Renewable Energy (China), and Total Eren (France), each planning up to 1 GW of capacity development. Kazakhstan's state-owned enterprises such as Samruk-Energy JSC and TsATEK JSC, as well as multinational energy corporations like Total, Eni (Arm Wind), Shell, and ERG, have also become increasingly involved in the RE space. ERG, in particular, has launched its first wind power project in the Aktobe region with a planned capacity of up to 155 MW. On the debt side, the RE sector has attracted significant support from development finance institutions.

Table 1. Equity Investors in Kazakhstan's Renewable Energy Projects

No	Category	Examples of Investors
1.	Active Renewable Energy Companies	China: Universal Energy Ltd., Risen Energy, China Power International Holding Ltd., Next Green Energy Russia: Hevel, TOO "EvRus", TOO "Afrik" Germany: SOLARNET, DERA GmbH France: Urbasolar SAS
2.	Renewable Energy Companies with Signed Agreements	Aqua Power (Saudi Arabia) – 1 GW Masdar (UAE) – 1 GW SANY Renewable Energy (China) – 1 GW Total Eren (France) – 1 GW
3.	Companies with Coal Power Generation Assets	Samruk-Energy JSC TsATEK JSC
4.	Oil and Gas Companies	Total (France) Arm Wind, subsidiary of Eni (Italy) Shell (Netherlands)
5.	Mining Companies	ERG – construction of the first wind power plant in Aktobe region with up to 155 MW capacity

Note: compiled on the basis of AIFC data

The European Bank for Reconstruction and Development (EBRD) has provided nearly \$500 million, while the Eurasian Development Bank has contributed \$219 million. The Development Bank of Kazakhstan has committed over KZT 100 billion, and global climate-related funds such as the Green Climate Fund (GCF) and Clean Technology Fund (CTF) have together allocated \$120 million. Additional support comes from the Asian Development Bank, which has provided \$42 million in financing. This blend of local equity participation and international debt funding has created a favorable financial environment for accelerating RE deployment in Kazakhstan, although the scalability of future projects will largely depend on the continued availability of concessional loans, auction price signals, and effective risk mitigation instruments supported by government policy and audit mechanisms.

The presented data clearly demonstrate Kazakhstan's gradual yet consistent transition toward renewable energy sources (RES), with 130 operational RES facilities generating over 5.1 billion kWh of electricity as of the end of 2022—accounting for a small but growing share of the national energy mix. Despite impressive growth in installed capacity, RES still account for only 9.7% of total generation capacity and less than 5% of total electricity output, underscoring the need for more effective policy implementation and financial oversight to accelerate the green transition.

In this context, state audit plays a crucial role in ensuring that government-supported initiatives in the energy sector are both financially sound and environmentally effective. As billions of tenge and substantial volumes of international climate finance flow into renewable energy development, auditors must move beyond conventional compliance reviews and adopt performance- and impact-based audit methodologies. This involves verifying not only the legality and efficiency of expenditures but also assessing whether public investments in RES projects lead to measurable progress toward national decarbonization goals.

Thus, the integration of sustainability criteria and climate indicators into the planning, execution, and evaluation stages of public audits becomes essential. Effective public financial oversight can strengthen transparency, increase investor confidence, and guide future budget allocations—ensuring that Kazakhstan's ambitious targets, including carbon neutrality by 2060, are supported by real, verifiable outcomes at the national and local levels.

CONCLUSION

Kazakhstan's commitment to international climate agreements and its long-term strategy for achieving carbon neutrality by 2060 have positioned the renewable energy sector as a national priority. The steady growth in the number and capacity of renewable energy installations—alongside increasing volumes of public and private investment—demonstrates clear momentum toward a low-carbon energy system. However, challenges remain in ensuring the effective, transparent, and results-oriented use of budgetary resources allocated to this transition.

This article has shown that while significant financial flows—from both domestic and international sources—are directed toward renewable energy projects, the mechanisms for monitoring their efficiency and long-term impact require further development. In this regard, state audit institutions play a pivotal role. By applying modern audit tools and methodologies—such as performance, environmental, and sustainability audits—public auditors can assess not only compliance but also the effectiveness and strategic value of renewable energy investments.

To meet Kazakhstan's decarbonization targets and improve the efficiency of public spending, audit bodies must integrate climate-related indicators and risk-based approaches into their frameworks. This will ensure that investments in renewable energy deliver measurable economic, social, and environmental outcomes. Strengthening the institutional capacity of state audit bodies and aligning their practices with international standards will be key to supporting a sustainable energy future for Kazakhstan.

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ЭНЕРГЕТИКА СЕКТОРЫНДАҒЫ БЮДЖЕТ ҚАРАЖАТЫНЫҢ ТИІМДІ ПАЙДАЛАНЫЛУЫНА МЕМЛЕКЕТТІК АУДИТ ЖҮРГІЗУ ЖӘНЕ ЖАҢАРТЫЛАТЫН ЭНЕРГИЯҒА КӨШУ МӘСЕЛЕЛЕРІ

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Аңдатпа. Бұл мақалада Қазақстан Республикасындағы жаңартылатын энергия көздерін (ЖЭК) дамытуға бағытталған бюджет қаражатының тиімді пайдаланылуын қамтамасыз етудегі мемлекеттік аудиттің әдіснамалық және институционалдық негіздері қарастырылады. Зерттеудің өзектілігі елдің 2060 жылға дейін көміртегі бейтараптығына қол жеткізу жөніндегі стратегиясымен және жасыл энергетика саласына мемлекеттік және халықаралық инвестиция көлемінің ұлғаюымен айқындалады. Зерттеудің мақсаты – мемлекеттік қолдаумен іске асырылатын ЖЭК жобаларының ашықтығы мен нәтижелілігін қамтамасыз етуде қолданыстағы аудит механизмдерінің тиімділігін талдау. Зерттеу барысында нормативтік актілерге контент-талдау, 2018-2024 жылдар аралығындағы деректердің статистикалық өңдеуі және халықаралық тәжірибелермен салыстырмалы талдау жүргізілді. ЖЭК қаржыландыру құрылымына (70/30 үлгісі), ин-

вестициялық преференциялар мен реттеуші шараларға ерекше назар аударылды. ЖЭК қуаттылығын арттыруда айтарлықтай ілгерілеу болғанымен, экологиялық және экономикалық тиімділікті бағалауда аудит әдістемесі әлі де әлсіз. Мақалада аудитке климаттық көрсеткіштерді енгізу ұсынылады. Зерттеудің ғылыми маңыздылығы – орнықты дамуға бағытталған мемлекеттік аудиттің аналитикалық тұжырымдамасын ұсыну. Практикалық маңыздылығы – бюджет қаражатын тиімді пайдалану үшін аудит құралдарын жетілдіруге арналған ұсыныстарда.

Түйін сөздер: мемлекеттік аудит, энергетика секторы, бюджет тиімділігі, жаңартылатын энергия, мемлекеттік шығындар, энергетикалық ауысу, тұрақты даму, аудит бағалауы, жасыл энергия, мемлекеттік реттеу

ГОСУДАРСТВЕННЫЙ АУДИТ ЭФФЕКТИВНОГО ИСПОЛЬЗОВАНИЯ БЮДЖЕТНЫХ СРЕДСТВ В ЭНЕРГЕТИЧЕСКОМ СЕКТОРЕ И ПРОБЛЕМЫ ПЕРЕХОДА НА ВОЗОБНОВЛЯЕМЫЕ ИСТОЧНИКИ ЭНЕРГИИ

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Аннотация: Статья посвящена исследованию методологических и институциональных основ государственного аудита эффективности использования бюджетных средств, направляемых на развитие возобновляемых источников энергии (ВИЭ) в Республике Казахстан. Актуальность работы обусловлена стратегическим курсом страны на достижение углеродной нейтральности к 2060 году и ростом объемов как государственных, так и международных инвестиций в сферу зеленой энергетики. Цель исследования — проанализировать, в какой степени существующие механизмы аудита обеспечивают прозрачность, подотчетность и результативность реализации проектов ВИЭ, финансируемых из бюджета. Методологическая база включает контент-анализ нормативных актов, статистическую обработку данных за 2018–2024 гг., а также сравнительный обзор международной практики. Особое внимание уделено структуре финансирования ВИЭ (модель 70/30), инвестиционным преференциям и регулирующим мерам. Установлено, что несмотря на прогресс в наращивании мощностей ВИЭ, остаются методологические пробелы в части оценки экологической и экономической результативности. В статье предложена интеграция климатических индикаторов в процедуры государственного аудита. Научная новизна заключается в разработке аналитической основы для аудита, ориентированной на устойчивое развитие. Практическая значимость заключается в рекомендациях по совершенствованию инструментов аудита для повышения эффективности бюджетных расходов в энергетическом переходе Казахстана.

Ключевые слова: государственный аудит, энергетический сектор, бюджетная эффективность, возобновляемая энергия, государственные расходы, энергетический переход, устойчивое развитие, оценка аудита, зеленая энергия, государственное регулирование.