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REVIEW OF THE REGULATORY FRAMEWORK IN THE FIELD OF ENERGY INNOVATION TRANSFER

Summary

This paper explores the dynamic legislative landscape of Ukraine's energy sector, focusing on integrating renewable energy sources alongside the development of nuclear power plants (NPPs) to enhance energy security and meet climate objectives. Ukraine's strategic policy initiatives, including accelerating new NPP preparations by 2024, highlight its commitment to diversifying its energy mix and reducing greenhouse gas emissions. The enactment of the "Law of Ukraine on Alternative Energy Sources" in 2019 and the "Law of Ukraine on the Electricity Market" in 2020 underscore Ukraine's efforts to align with international standards, particularly those of the European Union, by fostering a competitive and liberalized energy market conducive to innovation and sustainability. Additionally, including scenarios from the World Energy Council's 2021 report emphasizes the critical role of innovative energy solutions in achieving sustainability. By analyzing these legislative measures and their impact on the energy sector, the paper discusses how Ukraine positions itself as a leader in the transition to a more sustainable and secure energy future through a balanced approach to nuclear power development and renewable energy production.

Introduction

Ukraine's energy sector is adapting to environmental and technological trends, necessitating innovation. Commitments under the Paris Agreement and the EU agreement demand legislative updates and strategies, although barriers slow innovations. Ukraine aims for carbon neutrality, considering its potential

in renewable energy and the need for infrastructure modernization. Climate change and efforts to reduce emissions highlight this need. The importance of the legal framework for the transfer of innovations in energy includes laws that promote the development of renewable sources and efficiency, as well as international agreements for emission reduction – adapting legislation to challenges.

Carbon neutrality refers to a state of the economy where the amount of carbon emissions produced by human activities is fully offset by capturing carbon from the atmosphere. This strategy aims to balance emissions we cannot avoid with our ability to remove carbon from the atmosphere.

The transition to a carbon-neutral economy typically involves increasing the efficiency of energy use; widespread adoption of renewable energy sources such as solar, wind, and hydroelectric power that can replace traditional carbon-based sources; utilizing carbon capture and storage (CCS) technologies at industrial sites and power plants to reduce emissions; and reforming economic sectors like agriculture and transportation with the goal of emission reduction.

Carbon neutrality is becoming a strategic objective for many economies where carbon emissions are fully offset by capturing it from the atmosphere. Achieving this goal requires transitioning to a carbon-neutral economy, including efficient energy use, expanded use of renewable sources, implementation of carbon capture and storage technologies, and reforming key sectors.

Like many other countries, Ukraine faces complex challenges related to climate change and military conflicts that negatively impact the energy infrastructure and power generation capacities. Under conditions of damaged energy infrastructure and reduced power generation capacity, transitioning to sustainable energy becomes necessary for the economy.

Amidst global climate change and challenges associated with military actions, Ukraine's energy sector in 2024 faces complex issues, requiring immediate restoration and profound modernization of its infrastructure. Significant damage to the energy infrastructure, including about 45% of vital high-voltage transformers and nearly a 50% reduction in overall energy generation capacity from the 2022 levels, calls for unconventional solutions and an innovative approach [7]. In this context, developing a legal framework for the transfer of energy innovations becomes critically important. Attention should be paid to Ukraine's experience in regulating innovative activities, highlighting the importance of effective legal regulation for developing and implementing innovative processes in enterprises. Shatylo (2023) emphasizes that creating a unified Innovation Code for Ukraine could boost investments in scientific research and development, a crucial element in addressing the energy sector's challenges [32].

In this context, achieving carbon neutrality and innovations in energy are vital to enhancing Ukraine's energy security and efficiency, requiring adaptive legislation supporting sustainable development and implementing cutting-edge technologies.

Carbon capture and storage (CCS) technologies in Ukraine are developing through pilot projects, especially in large enterprises. Enhancing energy storage systems and developing smart grids are essential to more efficient energy use. Ukraine is working on recovery and advancement towards environmental sustainability, carbon neutrality, and integration into global energy processes, including building thermomodernization, reducing consumption and emissions.

On the other hand, Ukraine is actively working on the recovery and development of the energy sector, especially in renewable and nuclear energy fields. Developing nuclear energy, including the modernization of existing nuclear power plants and research in new technologies such as small modular reactors, could help reduce dependence on fossil fuels and ensure a stable energy supply.

New laws and regulations aim to provide flexibility for renewable energy producers, stimulate green development, and strengthen the investment climate. The government has also approved a bill on the sustainable development of energy infrastructure to recover and enhance the energy system's resilience [24; 12]. The use of biomass and biogas is increasing, helping to reduce dependence on imported energy resources and, at the same time, facilitating waste utilization.

An important step is the active development of nuclear energy, as outlined in the plans of the Ministry of Energy. The government is also accelerating work on the National Energy and Climate Plan, which includes medium-term energy and climate development plans, identifying gaps, state policies, investment needs, and directions for international cooperation [14; 33]. Deepening cooperation with the European Union and integration into the European energy network will enhance energy security, diversify supply sources, and develop renewable energy.

Moreover, the market features many producers, including thermal, hydraulic, nuclear, and alternative energy companies. In recent years, alternative energy, particularly solar and wind energy, has rapidly developed [14; 33]. Ukraine is installing many solar power stations, including one of the largest in Europe in the Chornobyl zone. It's not only helps reduce dependence on fossil fuels but also aids in rehabilitating contaminated territories. Ukraine also has the potential to expand wind energy, especially in the southern and western regions.

Chapter 1. The Importance of the Regulatory Framework for Facilitating and Regulating the Transfer of Innovations

Understanding and applying the regulatory framework governing this activity is a crucial prerequisite for effectively transferring energy innovations. According to Filatov and Boyko (2023), the legal framework plays a crucial role in creating a conducive environment for developing and implementing innovations in the energy sector. The authors thoroughly explore the fundamental concepts and principles of constructing such a framework and analyze legislative acts that directly impact energy innovation activities in Ukraine [11].

Despite the adoption of the Law of Ukraine "On Alternative Energy Sources" (2019), aimed at supporting the development of renewable energy sources, there is an urgent need for increased funding for research and development in this area to achieve significant technological breakthroughs [34]. It's indicates that while necessary, legislative measures require supplementation through strengthening financial and scientific-technical support for innovative projects.

The importance of legislation in supporting and regulating innovation is crucial, as it underpins developing and implementing new technologies, especially in the energy sector. It can facilitate innovations, provide support and protection, or create obstacles through bureaucracy and outdated rules.

Simplifying the regulatory environment and minimizing bureaucratic procedures are key to stimulating innovation (Law of Ukraine "On the Electricity Market", 2020). However, current licensing and registration requirements for new technologies often complicate this process, delaying the implementation of innovative projects [35].

Well-structured legislative incentives can foster investments in new energy technologies. It's may include tax breaks, research and development grants, and simplified permit procedures for innovative projects. Support for producing and using renewable energy sources through legislative quotas and tariffs is also crucial.

The regulatory framework should also facilitate international integration and technology exchange. It's includes harmonizing standards and norms with international requirements, allowing countries to participate in international innovative projects and programs, such as Horizon 2020 in the EU.

In the context of Ukraine, the current regulatory framework that facilitates the transition to a carbon-neutral economy includes various laws and regulations. The "Law on Renewable Energy" aims to encourage the use of renewable sources. At the same time, the "Low Carbon Development Strategy until 2050" sets long-term goals for transitioning Ukraine to sustainable development principles, reducing greenhouse gas emissions, and increasing the share of renewable sources in the country's energy balance [23; 25]. These ambitious national goals focus on boosting the share of green energy in

the national energy mix. These key documents form the basis for implementing innovative energy projects incorporating advanced technologies and methodologies to enhance resource use efficiency and reduce environmental impact.

Ukrainian legislation in alternative energy and building energy efficiency promotes the implementation of energy-saving solutions and the development of alternative energy sources. The "Law on Alternative Energy Sources," which regulates the use of alternative energy sources, promotes the development and implementation of new technologies for energy independence and carbon emissions reduction; and the "Law on Energy Efficiency of Buildings", is aimed at reducing energy consumption in the construction sector, crucial for lowering overall carbon emissions, are examples of how regulatory regulation can stimulate an environmental transition while ensuring the country's energy independence [20; 21].

This law aims to increase energy efficiency but overlooks intellectual property protection for innovations, potentially hindering innovation activity and commercialization of inventions due to the lack of guarantees for innovators [18]. There's a pressing need to improve legislation on intellectual property in the energy sector to encourage the development of new technologies, increase efficiency, and support Ukraine's sustainable development.

Furthermore, strategic documents such as the Energy Security Strategy and the law on innovative activity play a crucial role in shaping the vision for the energy sector's development, including innovations and the implementation of green technologies as critical components for achieving sustainable development. The Energy Security Strategy outlines the fundamental principles and directions for developing the country's energy security, including innovations and green technologies [8; 9]. Whereas the Law on Innovative Activity regulates the legal relationships in innovations, defining the legal, economic, and social foundations of state support for innovations, which may include energy innovations [22].

Key laws such as "On Electricity" and "On the Natural Gas Market" outline the structure and mechanisms of the energy market in Ukraine, highlighting the need to create a competitive environment and protect consumer rights [17; 19].

The "Electric Power Market Act" regulates the production and supply of electricity in Ukraine, ensuring consumer reliability, safety, and efficiency while promoting market competition and European standards. The "Natural Gas Market Act" establishes the legal framework for the gas market, supporting free competition and consumer rights protection, thereby reducing import dependency. The "Alternative Energy Sources Act" defines incentives for developing and using renewable sources, such as solar and wind energy,

improving environmental conditions and reducing reliance on traditional energy resources [34].

Decrees by the Cabinet of Ministers of Ukraine, especially on promoting renewable energy production through mechanisms like green tariffs or auctions, alongside energy audits, play a crucial role in implementing energy-saving policies and supporting renewable [31]. Regulatory documents from the National Commission regulating utilities and national standards like DSTU ISO 50001 outline requirements for energy management quality and efficiency, aiming to enhance energy efficiency standards in enterprises and buildings [30, 5]. Legal acts in energy efficiency and renewable energy use establish guidelines and recommendations for energy saving and adopting modern technologies. Regulations on network access and tariff setting for consumers and producers ensure fair and transparent pricing for energy resources [28]. National standards and building codes related to energy efficiency in buildings and strategic documents, including the National strategy for reducing greenhouse gas emissions and adapting to climate change, highlight Ukraine's long-term goals in climate and energy, emphasizing nature-based solutions unlike the updated EU Climate Adaptation Strategy [26; 27; 3]. The state program for energy development includes measures for energy infrastructure modernization, renewable energy development, and increased energy efficiency.

By ratifying the Paris Agreement, Ukraine committed to a significant reduction in global warming to levels "well below 2°C" compared to pre-industrial times, striving to prevent its increase beyond 1.5°C. This commitment requires the appropriate adaptation of Ukraine's national energy policy to align with these global climate change goals [10].

As a member of the Energy Community, Ukraine is obligated to harmonize its legislation with European norms in energy policy, energy efficiency, development of renewable energy sources, and environmental protection. This aims to integrate the energy market and apply European standards and practices.

The Association Agreement between Ukraine and the European Union lays the foundation for cooperation in the energy sector, including integrating energy markets, promoting renewable energy sources development, and increasing energy efficiency [13]. It also entails facilitating technology transfer and innovations, especially those aimed at reducing greenhouse gas emissions.

International support and Ukraine's efforts in energy reforms highlight the importance of renewable energy sources to reduce dependence on imported fossil fuels and minimize greenhouse gas emissions. Recognition by international partners of Ukraine's renewable energy potential can contribute to economic benefits through the export of clean energy. Widely supported

energy efficiency initiatives allow for reduced energy consumption, costs, and carbon emissions.

Integration with the European Union through the alignment of Ukraine's national energy policy with the Third Energy Package of the EU is a strategically important step that enhances energy security stability, and expands opportunities for cooperation in renewable energy sources.

The application of advanced carbon capture and storage (CCS) and carbon utilization (CCU) technologies, despite global debates, is considered by some international partners as a crucial element of a comprehensive strategy for the country's transition to a low-carbon economy, especially in sectors like heavy industry and energy, where decarbonization presents certain challenges.

Overall, a balanced transition strategy, including implementing renewable energy sources, increasing energy efficiency levels, harmonizing with international energy standards, and introducing innovative technologies, is highlighted as an optimal strategy that provides mutual benefits for Ukraine and its global partners.

Chapter 2. Analysis of the Effectiveness of the Regulatory Framework and Its Impact on Innovation Development in Ukraine's Energy Sector

The analysis of the effectiveness of the regulatory framework and its impact on innovation development in Ukraine's energy sector highlights the importance of adapting legislation to international agreements and initiatives, particularly the Paris Agreement and the Association Agreement with the EU. This adaptation forms the foundation for stimulating innovations in the energy sector through legislative initiatives that include tax incentives, subsidies, and other support, creating conditions for developing and implementing innovative technologies. However, certain limitations require review and optimization to achieve more effective innovation development.

The regulatory framework supports innovation development by providing financial support and incentives for implementing new technologies. Yet, bureaucratic barriers, difficulties in accessing financing, and a lack of infrastructure for testing and implementing innovations are significant constraints that necessitate actions to simplify the regulatory environment, support research, develop infrastructure, and protect intellectual property.

A crucial aspect is contemplating paths for Ukraine's energy transformation and studying the historical experience of its regulatory framework. An in-depth analysis of the periodization of energy transformation, as proposed by V.S. Khomyn (2023), can serve as a solid foundation for formulating a new Energy Strategy for Ukraine [15].

In analyzing the regulatory framework that facilitates the transfer of energy innovations, special attention should be paid to Kuznetsov's (2023) research, which explores the comprehensive use of renewable energy sources and the

importance of regulatory regulation for the effective balancing of energy systems. Kuznetsov emphasizes the critical role of legislative and organizational measures in achieving energy efficiency and implementing energy management, which is integral to the successful transfer of innovations in renewable energy sources (RES). It's underscores the value of an integrated approach to the use of RES in addressing energy security and sustainable development issues, which should become an essential aspect in the section on regulatory support for innovative processes in energy [16].

The role of educational institutions in preparing highly qualified specialists and developing scientific research in the energy sector cannot be underestimated, especially in the context of creating an energy-efficient society through integrating educational programs, scientific research, and international cooperation. The study by Denysiuk and Shovkalyuk (2023) demonstrates how Igor Sikorsky Kyiv Polytechnic Institute has contributed to the formation of an energy-efficient society over the past 25 years through the integration of educational programs, scientific research, and international cooperation [4].

The importance of legal regulation in the field of energy innovations in Ukraine becomes particularly prominent when analyzing Oksana Shatilo's research, which thoroughly examines legislative norms and mechanisms favoring the strategic development of innovative processes at enterprises. In her 2023 work, Shatilo underscores the critical role of effective legislation in stimulating innovations and implementing cutting-edge technologies, ensuring national economic security and promoting social progress [32].

Analyzing the impact of the regulatory framework on stimulating and regulating innovations in Ukraine's energy sector, the research by Abramova and Haidutsky (2023), which reveals theoretical and methodological aspects along with the dynamics of wind energy sector development, deserves special attention. The authors focus on the decisive role of legislation in creating favorable conditions for wind energy projects, considering it a critically important element for ensuring sustainability and integrating renewable energy sources [1].

To overcome identified barriers and maximize the potential for innovations in the energy sector, the following steps are necessary:

Simplification of the Regulatory Environment: It's essential to minimize bureaucratic procedures simplify the licensing and registration process, making them more transparent and accessible for startups and innovative projects.

Support for Research and Development: Increasing government funding for scientific research in the energy sector and stimulating private investments are key to supporting innovations.

Infrastructure Development: Investing in creating and developing the infrastructure necessary for testing and commercializing innovative solutions, including innovation hubs and research centers, is crucial.

Protection of Intellectual Property: Enhancing legislation in this area will ensure proper protection of innovators' rights, facilitating further commercialization and development of new technologies.

The importance of developing and implementing innovations in Ukraine's energy sector to ensure sustainable development and energy security cannot be overstated. In this regard, the regulation of investment-innovation activity plays a special role, allowing the stimulation of the introduction and dissemination of cutting-edge technologies in the power sector. Pavlova, Pavlov, Pysanko, and Matiychuk (2023) have thoroughly investigated the mechanisms and methodologies of state regulation of investment-innovation processes in the power sector, including analyzing the existing regulatory framework and suggestions for its improvement. That provides valuable insights into the implementation of innovations and can serve as a substantial foundation for further developments in this area [29].

Conclusion

The analysis underlines the critical nexus between innovative energy strategies and legislative support in Ukraine, emphasizing the imperative for a nuanced approach to energy sector reform. The Ukrainian government's commitment to diversifying its energy mix through developing nuclear power and alternative energy sources, backed by a solid legal framework, sets a forward-looking trajectory for the nation's energy policy. However, realizing these ambitions hinges on overcoming systemic barriers, including bureaucracy, financing challenges, and infrastructure deficits. Streamlining regulatory processes, bolstering research and development, enhancing intellectual property protection, and aligning with international energy standards and agreements are essential steps towards Ukraine's sustainable and secure energy future. By addressing these core issues, Ukraine can harness its full potential in renewable energy, nuclear power, and innovative technologies, positioning itself as a leader in energy innovation and collaboration within the global community.

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References:

1. Abramova, K., & Gaidutskyi, I. (2023). Theoretical and Methodological Foundations of the Wind Energy Industry and Its Development in Ukraine. *Economy and Society*, *56*. DOI: https://doi.org/10.32782/2524-0072/2023-56-79
2. Cabinet of Ministers of Ukraine (2024). Retrieved from https://www.kmu.gov.ua/

3. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. (n.d.). European Union. Retrieved March 11, 2024. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082&from=EN

4. Denisyuk, S. P., & Shovkaliuk, M. M. (2023). NTUU "KPI" on the way to forming an energy-efficient society. 25 years of experience. *Energy: Economics, Technologies, Ecology*, 1, 7–21. DOI: https://doi.org/10.20535/1813-5420.1.2023.275926

5. DSTU ISO 50001 "Energy Management Systems". (n.d.). Online Standards Catalog. https://online.budstandart.com/ua/catalog/doc-page.html?id_doc=90178

6. Electric power industry of Ukraine: current state and prospects (2024). YouControl Market Blog. Retrieved from https://blog.youcontrol.market/ieliektroienierghietika-ukrayini-stan-i-pierspiektivi/

7. Energy Sector in Ukraine and the World: Forecasts and Challenges (2024). BDO Ukraine. Retrieved from https://www.bdo.ua/uk-ua/insights-2/information-materials/2024/energy-sector-in-ukraine-and-the-world-forecasts-and-challenges

8. Energy Security Strategy (2024). Cabinet of Ministers of Ukraine. Retrieved from https://www.kmu.gov.ua/storage/app/sites/1/18%20-%20Department/18%20-%20PDF/08.2021/energetuchna-bezpeka-copy.pdf

9. Energy Security Strategy (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/907-2021-%D1%80#Text

10. European Union (2015). Paris Agreement. Retrieved from https://unfccc.int/

11. Filatov, V. I., & Boyko, N. G. (2023). Regulatory framework of the energy sector, 2023. Kyiv: Igor Sikorsky Kyiv Polytechnic Institute. Retrieved from https://ela.kpi.ua/server/api/core/bitstreams/70bdabfe-cce7-447a-af39-bbb162276261/content

12. Government approves a bill on sustainable development of energy infrastructure. (2024). Ukrainian Energy. Retrieved from https://ua-energy.org/uk/posts/uriad-skhvalyv-zakonoproiekt-pro-stalyi-rozvytok-enerhetychnoi-infrastruktury

13. Government of Ukraine. Association Agreement between Ukraine and the European Union (2017). Retrieved from https://www.kmu.gov.ua/storage/app/sites/1/uploaded-files/ASSOCIATION%20AGREEMENT.pdf

14. Halushchenko, H. (2024). Ukraine will actively develop nuclear energy in 2024. Cabinet of Ministers of Ukraine. Retrieved from https://www.kmu.gov.ua/news/herman-halushchenko-ukraina-u-2024-bude-aktyvno-rozvyvaty-atomnu-enerhetyku

15. Khomyn, V. S. (2023). Regulatory framework for energy transformation in Ukraine. *Economy and Law*, 2, 26–42. https://doi.org/10.15407/econlaw.2023.02.026

16. Kuznetsov, M. P. (2023). Comprehensive use of renewable energy sources – Results of the scientific-practical conference. *Renewable Energy*, 2, 6–10. DOI: https://doi.org/10.36296/1819-8058.2023.2(73)6-10

17. Law of Ukraine "On Electric Power Industry" (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/575/97-%D0%B2%D1%80

18. Law of Ukraine "On Energy Efficiency" (2018). Verkhovna Rada of Ukraine. Retrieved from https://faolex.fao.org/docs/pdf/ukr175105.pdf

19. Law of Ukraine "On the Natural Gas Market" (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/329-19#Text

20. Law on Alternative Energy Sources (2024). Liga Zakon. Retrieved from https://ips.ligazakon.net/document/view/t030555?ed=2023_06_10

21. Law on Energy Efficiency of Buildings (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/2118-19#Text

22. Law on Innovation Activity (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/40-15#Text

23. Law on Renewable Energy (2023). Liga Zakon. Retrieved from https://ips.ligazakon.net/document/view/t233220?ed=2023_06_30

24. Legislative changes in the energy sector of Ukraine (2024). BDO Ukraine. Retrieved from https://www.bdo.ua/uk-ua/insights-2/information-materials/2024/legislative-changes-in-the-energy-sector-of-ukraine

25. Low-Carbon Development Strategy until 2050 (2024). FAOLEX. Retrieved from https://faolex.fao.org/docs/pdf/ukr179435.pdf

26. Main requirements for buildings and structures. Energy saving and energy efficiency (2024). Online Standards Catalog. Retrieved from https://online.budstandart.com/ua/catalog/doc-page.html?id_doc=98036

27. On approval of the Environmental Safety and Climate Change Adaptation Strategy for the period up to 2030. (2024). Cabinet of Ministers of Ukraine. Retrieved from https://www.kmu.gov.ua/npas/pro-shvalennya-strategiyi-ekologichno-a1363r

28. On setting the tariff for electricity transmission services (2024). National Energy and Utilities Regulatory Commission. Retrieved from https://www.nerc.gov.ua/acts/pro-vstanovlennya-tarifu-na-poslugi-z-peredachi-elektrichnoyi-energiyi-nek-ukrenergo-na-2024-rik

29. Pavlova, O. M., Pavlov, K. V., Pysanko, S. V., & Matiichuk, L. P. (2023). Regulation of investment and innovation activity in the electric power industry of Ukraine 2023. Retrieved from https://evnuir.vnu.edu.ua/bitstream/123456789/21736/1/monohraf_2023.pdf

30. Regulatory Acts (2024). State Agency on Energy Efficiency and Energy Saving of Ukraine.Retrieved from https://saee.gov.ua/uk/regulations

31. Resolution on stimulating the production of electricity from renewable sources (2024). Verkhovna Rada of Ukraine. Retrieved from https://zakon.rada.gov.ua/laws/show/1175-2019-%D0%BF#Text

32. Shatilo, O. (2023). Legal regulation of the strategic development of innovative processes in enterprises. *Entrepreneurship and Trade*, 36. DOI: https://doi.org/10.32782/2522-1256-2023-36-05

33. Ukraine accelerates preparation for NPPs (2024). Ukrainian Energy. Retrieved from https://ua-energy.org/uk/posts/domashnie-zavdannia-ukraina-pryshvydshuie-pidhotovku-npek

34. Verkhovna Rada of Ukraine (2019). Law of Ukraine "On Alternative Energy Sources". Retrieved from https://zakon.rada.gov.ua/laws/show/555-15#Text

35. Verkhovna Rada of Ukraine (2020). Law of Ukraine "On the Electricity Market". Retrieved from https://zakon.rada.gov.ua/

36. World Energy Council (2021). World Energy Scenarios: 2021 – Innovating energy solutions for a sustainable future. London, UK.