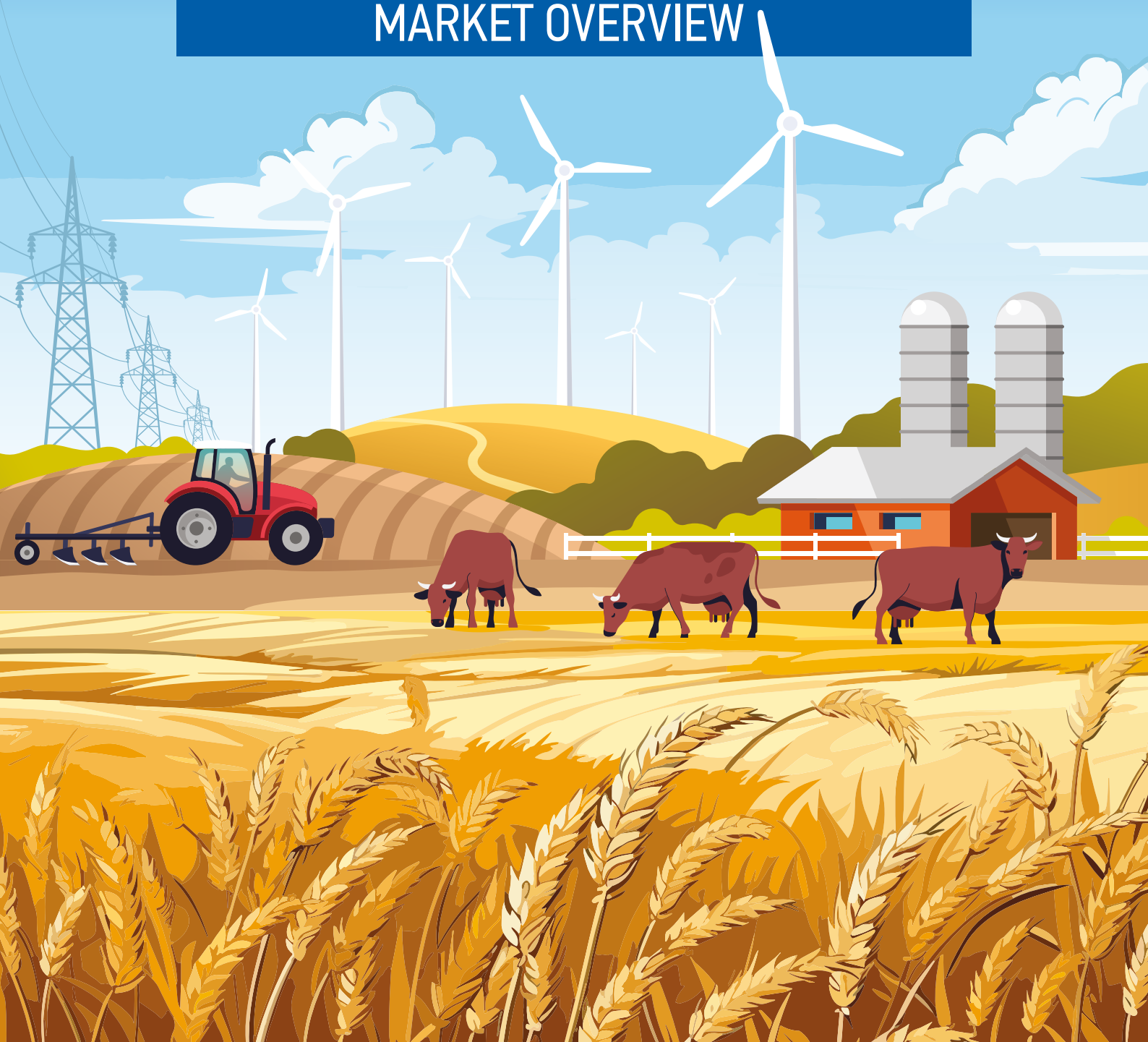


# UKRAINIAN WIND POWER SECTOR 2024

## MARKET OVERVIEW





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# UKRAINIAN WIND POWER SECTOR 2024

## MARKET OVERVIEW

Ukrainian Wind Power Sector Market Overview 2024 has been developed by the **Public Union Ukrainian Wind Energy Association** in collaboration with legal firms **ASTERS** and **ALTELAW**.

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## THE UKRAINIAN WIND ENERGY ASSOCIATION

(the UWEA, Association) is Ukraine's largest professional association in the renewable energy sector. As a non-profit organization, the UWEA serves as the premier platform for communication and collaboration, advancing large-scale implementation of wind energy technologies and fostering the country's transition to a "green" energy future. Its mission is to promote the transformation of Ukraine's energy system and support the nation's post-war recovery through clean energy and sustainable development.

Established in 2008, the UWEA is dedicated to protecting the interests and supporting the endeavours of all stakeholders in the wind energy sector, both nationally and internationally. By the end of 2024, the UWEA united 102 companies from 16 countries, encompassing 100% of Ukraine's wind electricity producers, project developers, investors, manufacturers, and suppliers of wind energy equipment, as well as energy and construction companies, traders, designers, ecologists, and legal professionals.

The UWEA collaborates closely with national, regional, and local authorities, as well as leading international organizations such as the International Energy Agency, the International Renewable Energy Agency, and BloombergNEF. It is also a member of WindEurope.

In 2020, the UWEA expanded its focus to explore the potential for offshore wind energy development in the Black Sea. As a co-founder of the Black Sea Offshore Wind Energy Federation (BASOFWED), the UWEA has played a pivotal role in fostering regional cooperation. The founding protocol of BASOFWED was signed in October 2022 by the wind energy associations of Turkey, Ukraine, Georgia, and Bulgaria, with Romania's association joining later.

The UWEA's professionalism is underscored by multiple awards, including the prestigious "Choice of Ukraine 2017" and "Choice of the Country 2019" awards.

Since the onset of Russia's full-scale invasion of Ukraine in February 2022, the UWEA has also been actively engaged in volunteer efforts. Through the #Renewables4Ukraine platform the Association has mobilized resources to support essential infrastructure with renewable energy solutions.

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**ASTERS** – is the largest full-service law firm in Ukraine with offices in Kyiv, Brussels, London, and Washington, D.C. The firm has access to over 125 jurisdictions through a well-developed network of partner law firms.

Asters' Energy & Natural Resources team is one of the largest in the market and includes experts advising on regulatory, environmental, ESG, real estate, construction, corporate, M&A, finance and dispute resolution issues.

It advises international energy companies, institutional investors, developers, banks, lenders, EPC contractors, supply chain companies, technical service providers and governmental authorities on:

- regulatory compliance, including market design and obtaining all relevant permits and licensing documentation;

- energy efficiency and energy transition strategies
- energy-related transactions, including joint ventures, production sharing agreements, M&A, restructurings, merger clearance;
- construction projects, including land issues, supply, installation, O&M, FIDIC;
- project structuring, development and financing;
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**ALTELAW** – is a law firm with a proven track record of excellence in Ukraine's energy market since 2011. Specializing in energy and power markets across Ukraine and Europe, the firm has established itself over 14 years as a trusted legal partner for clients initiating or advancing energy projects.

With extensive experience, ALTELAW's expert team provides comprehensive legal support, whether for specific issues or delivering turnkey project solutions. The firm's expertise spans:

- legal oversight of project development and audits
- construction of energy facilities;
- participation in privatization initiatives;
- licensing and tariff setting;
- drafting and negotiation of market-relevant contracts;

- securing financing, investments, and loans;
- supporting the purchase and sale of energy enterprises;
- structuring operations for traders and suppliers;
- defending companies during inspections and legal proceedings.

Currently, ALTELAW's primary focus is advancing renewable energy in Ukraine and supporting the nation's energy transition.

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# FOREWORD



For over two years now Ukraine's wind energy sector has persevered and advanced in the face of war, overcoming immense challenges and adapting to new realities. Yet, the full-scale invasion has continued its relentless assault on the country's energy infrastructure. Analysts estimate that consolidated damages, losses, and needs of Ukraine's energy sector due to the full-scale invasion of the Russian Federation now exceed USD 56 billion. Russian attacks have devastated and crippled numerous power generation facilities, including renewable energy assets. Approximately 71% of Ukraine's wind energy capacity remains under temporary occupation.

Yet, while 2024 has been another year of trials, it has also unlocked new opportunities and laid the groundwork for future achievements. The industry refuses to stand still, pressing forward despite the challenges of our time: new projects are being developed, wind measurement campaigns conducted, financial avenues explored, and targeted

support mechanisms implemented. Though only 20 MW of new wind capacity was added to the grid last year, construction has already begun – or been announced – of new wind farms in the Zakarpattia, Lviv, Volyn, Mykolaiv, and Odesa regions, among others. Key players driving the development and implementation of wind energy projects remain the UWEA member companies, including DTEK Renewables, Elementum Energy, Eco-Optima, Wind Parks of Ukraine and Atlas Global Energy. In 2025, additional projects by Galnaftogaz and NOTUS Energy are set to break ground.

A landmark development at the close of 2024 and the beginning of 2025 has been the securing of the largest-ever tranche of international investment in Ukraine's energy sector – EUR 450 million, backed by guarantees from Denmark's Export and Investment Fund – for the completion of the second phase of the Tyligulska Wind Farm. Ukrainian financial institutions are also stepping up: Oschadbank has signed a series of agreements with Eco-Optima to finance the Sokalska Wind Farm, with a total investment of EUR 40 million.

Meanwhile, Ukraine's domestic wind turbine manufacturing is gaining momentum. Friendly Wind Technology, a subsidiary of MC Wind Parks of Ukraine, has announced the modernisation of its production lines, now capable of manufacturing the upgraded FWT-5.2 MW model with larger tower section diameters. The company is also expanding into logistics, strengthening its foothold in the sector.

Harmonizing renewable energy legislation with EU standards remains a strategic priority. In 2024, the European Commission assessed Ukraine's energy sector progress at 4 out of 5 points in its enlargement package. A significant milestone has been the launch of a national system for issuing Guarantees of Origin of Electricity from RES. However, the next crucial step is securing international recognition of these guarantees, particularly in European markets.

Despite these advancements, the sector continues to grapple with pressing challenges. Outstanding debts to RES electricity producers remain unresolved. The failure of the pilot “green” auctions in the fall of 2024 has underscored the urgent need for enhanced support mechanisms. Legislative reforms in the renewable energy sector require further systemic efforts to establish a transparent, efficient, and predictable market. Meanwhile, international investors remain cautious, wary of the country’s political and market volatility.

Nevertheless, Ukraine is unwavering in its path toward a decentralised, renewable, and sustainable energy system – with wind energy at its core. This strategic vision is enshrined in the National Energy and Climate Plan for the period up to 2030, the National Renewable Energy Action Plan for the period up to 2030, and the Distributed Generation Development Strategy until 2035, all adopted in 2024. At the national level, an ambitious target has been set: to expand Ukraine’s wind power capacity by more than 4 GW by 2030 – a goal that is entirely within reach with sustained state support.

I firmly believe that we have everything necessary to accelerate the sector’s growth: existing projects, international backing, and ambitious national objectives. Yet, sustained progress hinges on regulatory stability, effective financing mechanisms (*as discussed in Section 3.3 of this Overview*), and a refined strategy for attracting investment.

I extend my deepest gratitude to all those standing alongside the market and the Association – our member companies, international partners, investors, and advisors – who continue to support the development of Ukraine’s wind energy sector. Over the past year, 22 new companies have joined the UWEA, including eight international firms. Your solidarity, trust, and willingness to contribute to a better and safer future for Ukraine are invaluable. Your support in these difficult times is indispensable, and I am confident that, together, we will achieve our goals and ensure the stable growth of a sector that will help bring peace to our nation.

**Glory to Ukraine! Glory to our Heroes!**



**Andriy Konechenkov,**  
Chairman of the UWEA Board

# CONTENTS

<b>I. WIND ENERGY: ONE OF THE FASTEST-GROWING SOURCES OF ELECTRICITY GENERATION WORLDWIDE</b>	<b>7</b>
<b>II. UKRAINE'S ENERGY SECTOR: A SHIFT TOWARD DECENTRALISATION</b>	<b>15</b>
2.1. National Energy and Climate Plan for the period up to 2030	23
2.2. National Renewable Energy Action Plan for the period up to 2030	27
<b>III. UKRAINE'S WIND ENERGY SECTOR: ACHIEVEMENTS AND CHALLENGES</b>	<b>29</b>
3.1. Key market trends and wind energy projects	30
3.2. Implemented and announced RES support mechanisms: expectations vs. reality	48
3.3. Electricity Price Guarantee Fund: UWEA's contribution	55
3.4. Looking for the balance: an overview of relevant legal solutions for cooperation between developer and investor for wind energy project in Ukraine	58
3.5. The market for used wind turbines in Ukraine: a new era or a temporary solution?	60
3.6. Estimated offshore wind potential in Ukraine	63
<b>IV. REGULATORY FRAMEWORK FOR WIND POWER IN UKRAINE</b>	<b>67</b>
4.1. Major legislative changes in 2024	68
4.2. Expected changes in the regulatory and legal framework in the wind energy sector in 2025	78
4.3. Legislative changes to stimulate the development of the wind energy sector in Ukraine: market proposals	87
<b>V. UWEA ACTIVITIES</b>	<b>89</b>
5.1. Key achievements	90
5.2. Wind energy technologies for Ukraine's energy system recovery	93
5.3. Implementation of market-based incentive mechanisms for renewables	96
5.4. International activities	98
5.5. Cooperation with communities	101
5.6. UWEA webinar series 2024	103
5.7. Expansion of partnerships	105
5.8. Volunteer activities	108
<b>ABBREVIATIONS AND ACRONYMS</b>	<b>110</b>

# WIND ENERGY: ONE OF THE FASTEST- GROWING SOURCES OF ELECTRICITY GENERATION WORLDWIDE



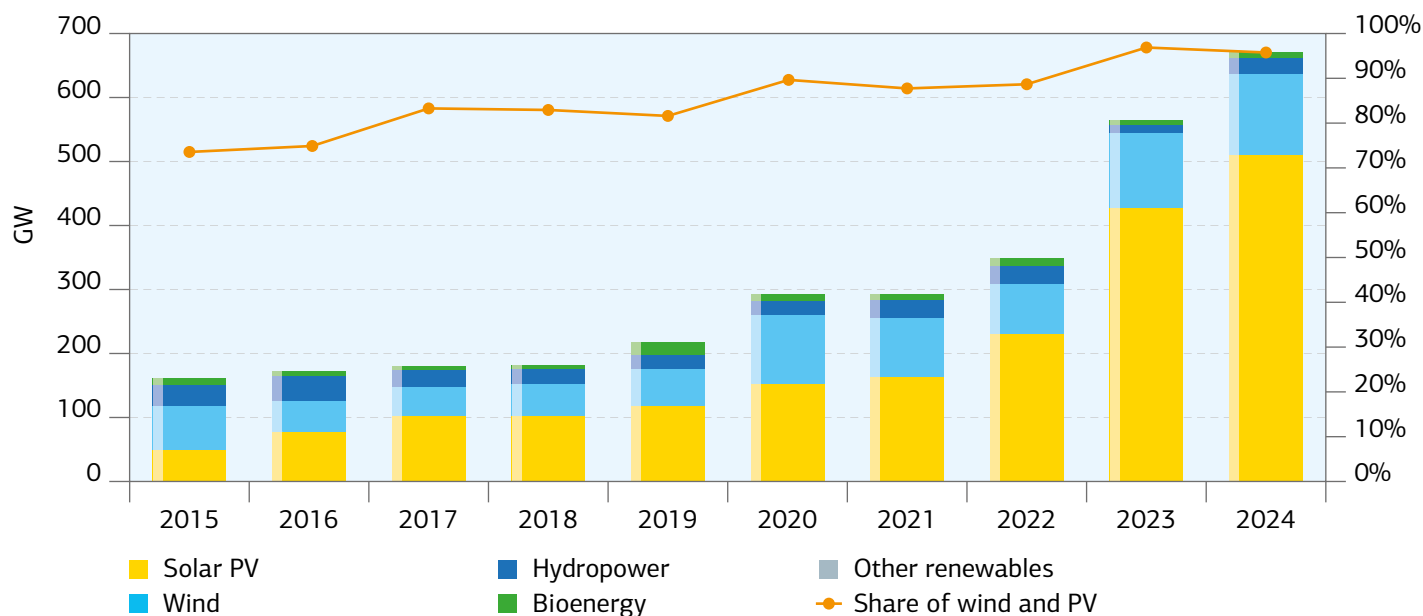
The year 2024 stands as a landmark in the global advancement of renewable energy, where wind power continues to hold its position as one of the fastest-growing technologies for electricity generation. However, a pressing question remains at the heart of global energy discussions: “Is renewable energy growing quickly enough to meet the world’s increasing electricity demand?” This question gained even greater prominence after COP28 (Dubai, UAE, 2023), where nearly 200 countries committed to tripling global renewable energy capacity by 2030.

According to the IEA, while the expansion of renewable energy represents one of the most successful narratives of the modern energy transition, the growth of clean electricity generation still struggles to keep pace with surging global demand. Between 2010 and 2023, global electricity production increased by almost 8,400 TWh. Over the same period, wind and solar power combined contributed 3,600 TWh of additional clean electricity. Yet, in some regions, the growth of clean energy has managed to outstrip the demand. Notable examples include Australia, South Korea, Japan, Argentina, South Africa, Brazil, and Mexico, where the rise in renewable energy production exceeded local consumption growth<sup>1</sup>.

Although all modelled scenarios for the deployment of renewable energy worldwide by 2030 show a visible increase in total capacity, the IEA highlights that, for the goal of tripling renewable energy capacity to be met, even faster investment decisions are required, along with a reassessment of national policies. The Agency points out that, for instance, in the next five years, wind energy alone is expected to grow by 160 GW annually.

The IRENA shares this perspective, emphasizing that “current national plans and targets will only account for half of the required renewable energy growth by 2030.”<sup>2</sup> In its report, “Tracking Progress Toward Tripling Renewable Energy Capacity and Doubling Energy Efficiency by 2030,”<sup>3</sup> the organization calculated that, in order to triple renewable energy capacity worldwide by 2030 – reaching a total of 11.2 TW – an average of 1,044 GW of new renewable energy generation must be deployed annually. Meanwhile, the “Renewable Energy 2024. Analysis and Forecast to 2030”<sup>4</sup> report from the IEA, notes that, in 2023, the world added 565 GW of new renewable energy capacity, and in 2024, this figure is expected to grow by 20%, reaching a maximum of 700 GW.

Figure 1.1. Global RES capacity additions, by technology, 2015-2024



Source: IEA, 2024

<sup>1</sup> <https://iea.blob.core.windows.net/assets/a5ba91c9-a41c-420c-b42e-1d3e9b96a215/WorldEnergyOutlook2024.pdf>

<sup>2</sup> <https://www.irena.org/Digital-content/Digital-Story/2024/Dec/2024-a-Year-of-Records-for-Renewables-Yet-Progress-Falls-Short-to-3xRenewables-by-2030/detail>

<sup>3</sup> [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Oct/IRENA\\_UAE\\_Consensus\\_2030\\_trippling\\_renewables\\_doubling\\_efficiency\\_2024.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Oct/IRENA_UAE_Consensus_2030_trippling_renewables_doubling_efficiency_2024.pdf)

<sup>4</sup> <https://www.iea.org/reports/renewables-2024>

Overall, the IEA forecasts that, under current policies and market conditions, global renewable energy capacity will reach 7,300 GW by 2028, generating 14,400 TWh of electricity. This means that by 2030, the IEA expects a 2.5-fold increase in global renewable energy capacity, with an average annual growth of 940 GW. This does not align with the COP28 target.

Modelled scenarios for the global wind energy sector also indicate the risk of missing the COP28 target, specifically reaching a global wind energy capacity of 2,742 GW by 2030. According to the global energy think tank Ember,<sup>5</sup> global wind energy capacity is projected to more than double – from 901 GW in 2022 to 2,157 GW by 2030 – creating a gap of 585 GW from the COP28 goal. However, this projected growth of 2,157 GW still aligns with the total national wind energy targets on a global scale, which stand at 2,100 GW.

At the same time, the world is gradually achieving one of the key objectives of the energy transition and the Paris Agreement – phasing out the use of fossil fuels. In 2024, the IEA officially declared that the world has entered the “Age of Electricity,” leaving behind the “Ages of Coal and Oil.”<sup>6</sup>

# EMBER

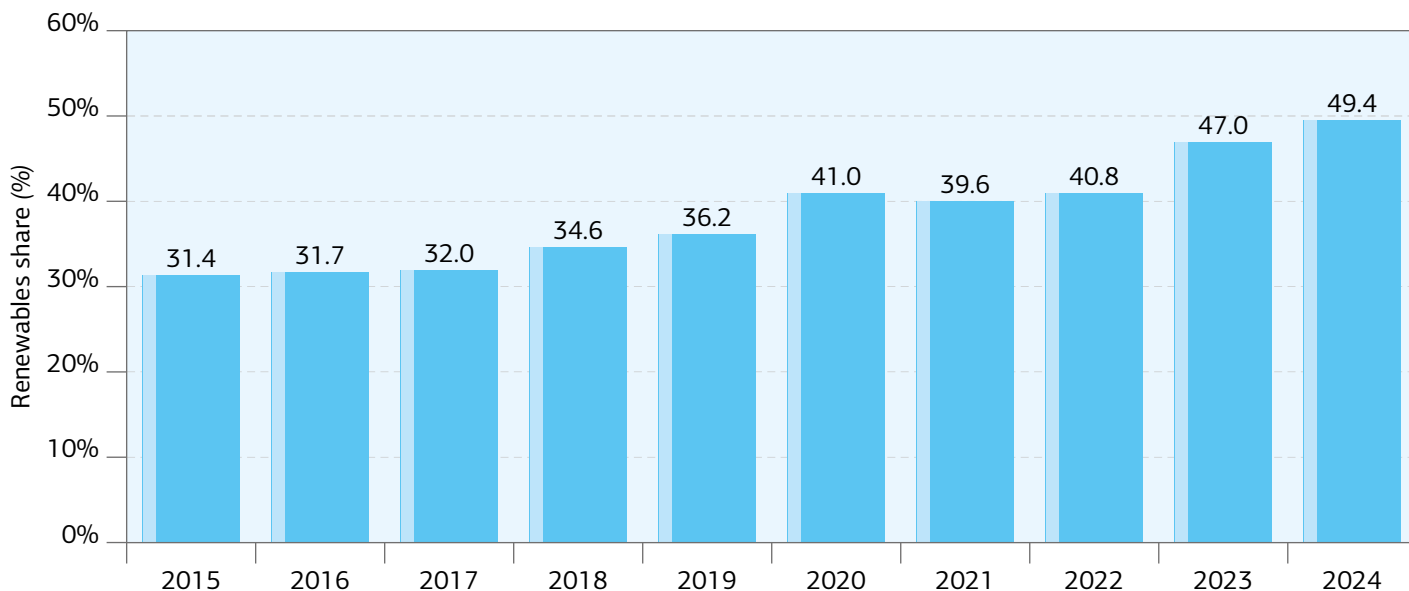


*Wind and solar power are growing fast enough to displace fossil fuels from the market*

According to Ember<sup>7</sup>, from January to November 2024, wind and solar energy provided a record 17% of electricity in the United States, surpassing coal for the first time, which accounted for 15%. Moreover, in March and April 2024, wind energy alone generated more electricity in the United States than coal, reaching 13-15% compared to 11% for coal. Looking at individual states, Ember notes that by 2024, 10 U.S. states generate 50% or more of their electricity from renewables.

Wind energy has also surpassed gas generation in the UK. According to the national transmission system operator (NESO), while gas generated 26.3% of the country’s electricity, national wind farms produced 30% (up from 28% in 2023)<sup>8</sup>.

Figure 1.2. Dynamics of the RES share in the EU electricity balance, 2015-2024



Source: Fraunhofer ISE, 2024

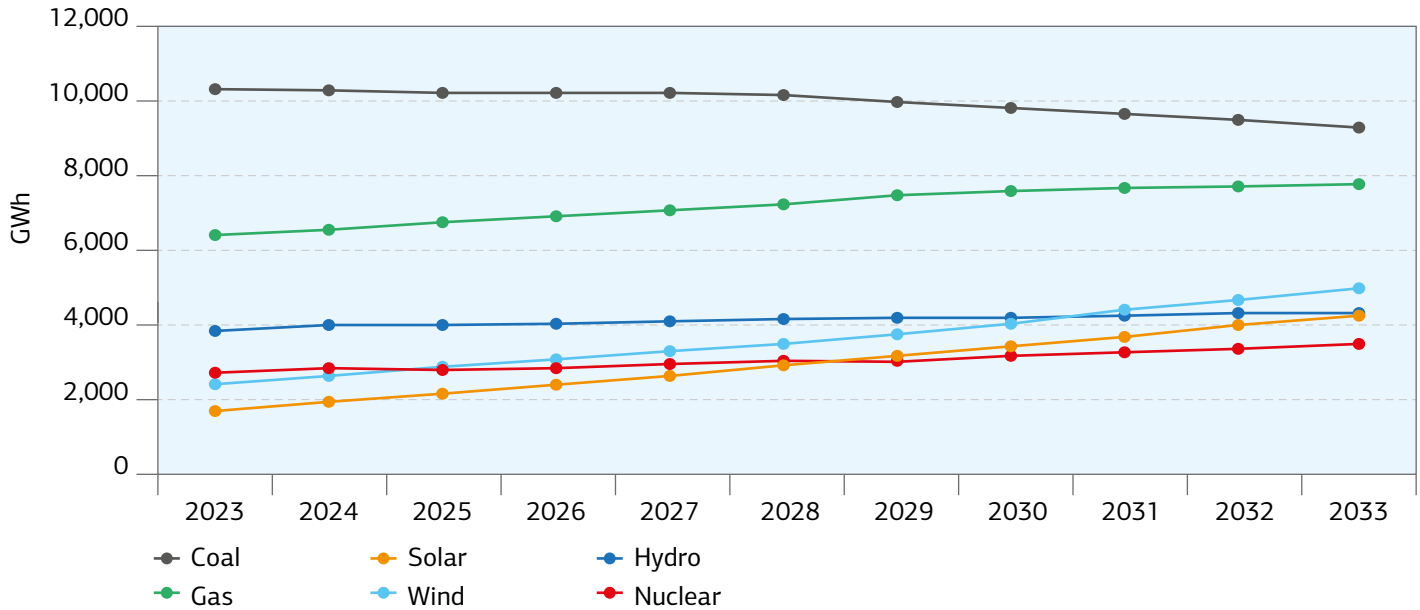
<sup>5</sup> <https://ember-energy.org/latest-insights/wind-targets-are-achievable-but-fall-short-of-a-tripling/>

<sup>6</sup> <https://www.iea.org/news/geopolitical-tensions-are-laying-bare-fragilities-in-the-global-energy-system-reinforcing-need-for-faster-expansion-of-clean-energy>

<sup>7</sup> <https://ember-energy.org/latest-insights/six-highlights-of-the-global-energy-transition-in-2024/>

<sup>8</sup> <https://www.energylivenews.com/2025/01/08/wind-blows-gas-away-from-top-power-spot/>

Figure 1.3. Forecasted changes in the structure of global electricity generation, by technology, 2023-2033



Source: EIU, 2024

Similar progress was observed across the EU: in the first six months of 2024, when fossil fuels accounted for 27% of the EU’s electricity balance, wind and solar generation hit new heights, rising to 30%.<sup>9</sup> Overall, according to Fraunhofer ISE<sup>10</sup>, in 2024, the share of renewables in the EU’s electricity balance increased to 49.4%, with wind energy contributing 17.5% (15.2% – onshore and 2.3% – offshore).

The trend of increasing generation from RES is expected to continue in the coming years globally as well. According to the Economist Intelligence Unit (EIU) forecast,<sup>11</sup> wind energy generation is expected to rise from approximately 3,000 TWh in 2023 to 5,000 TWh in 2033, while solar energy generation is projected to increase from 2,000 TWh in 2023 to

over 4,500 TWh in 2033. By 2033, solar and wind power combined are expected to generate more than 10,000 TWh of electricity, surpassing fossil fuel generation. According to conclusions from the IEA’s “Electricity Mid-Year Update” report,<sup>12</sup> the amount of electricity generated from renewables worldwide is expected to surpass that generated from coal for the first time in 2025. The share of RES in global electricity supply is expected to rise from 30% in 2023 to 35% in 2025 and to over 40% by 2035.

BloombergNEF provides a long-term forecast,<sup>13</sup> stating that by 2050, the global capacity of RES could range from 16 to 31 TW, with demand for oil, gas, and coal peaking and starting to sharply decline from 2025 onwards. Additionally, a quarter of the 31 TW of installed RES capacity will be required to power nearly 3.8 TW of electrolyzer capacity, expected to be operational by 2050.

Beyond political decisions and national strategies, these trends are also supported by the global investment and financial climate.

The IEA expected<sup>14</sup> that global energy sector investments in 2024 would exceed USD 3 trillion for the first time, with USD 2 trillion allocated to clean

iea

“  
For every dollar going to fossil fuels today,  
almost two dollars are invested in clean energy

<sup>9</sup> [https://ember-energy.org/app/uploads/2024/09/Report\\_Wind-and-solar-overtake-EU-fossil-fuels-in-the-first-half-of-2024.pdf](https://ember-energy.org/app/uploads/2024/09/Report_Wind-and-solar-overtake-EU-fossil-fuels-in-the-first-half-of-2024.pdf)

<sup>10</sup> [https://www.energy-charts.info/charts/renewable\\_share/chart.htm?l=en&c=ALL&interval=year&legendItems=01&share=ren\\_share](https://www.energy-charts.info/charts/renewable_share/chart.htm?l=en&c=ALL&interval=year&legendItems=01&share=ren_share)

<sup>11</sup> <https://www.eiu.com/n/campaigns/energy-outlook-2025/>

<sup>12</sup> [https://www.iea.org/news/global-electricity-demand-set-to-rise-strongly-this-year-and-next-reflecting-its-expanding-role-in-energy-systems-around-the-world?fbclid=IwZxh0bgNhZWOCMTAAAR2bbiuNknJfYqRWWhMa3uEwU\\_joXLuQk1WfqOHUjponu\\_9b23CaQnliA\\_A\\_aem\\_C3rDjAX68pPWEJRVPjv\\_5Q](https://www.iea.org/news/global-electricity-demand-set-to-rise-strongly-this-year-and-next-reflecting-its-expanding-role-in-energy-systems-around-the-world?fbclid=IwZxh0bgNhZWOCMTAAAR2bbiuNknJfYqRWWhMa3uEwU_joXLuQk1WfqOHUjponu_9b23CaQnliA_A_aem_C3rDjAX68pPWEJRVPjv_5Q)

<sup>13</sup> [https://about.bnef.com/new-energy-outlook/?fbclid=IwZxh0bgNhZWOCMTAAAR3bv-LmU\\_EjtXwNprkLXLrFLDmZ2vFMVGzMBzL3O59iPniGvLfmP8chgig\\_aem\\_KeiWI8pJ4wglbPWufWaWwA#exec-summary](https://about.bnef.com/new-energy-outlook/?fbclid=IwZxh0bgNhZWOCMTAAAR3bv-LmU_EjtXwNprkLXLrFLDmZ2vFMVGzMBzL3O59iPniGvLfmP8chgig_aem_KeiWI8pJ4wglbPWufWaWwA#exec-summary)

<sup>14</sup> <https://iea.blob.core.windows.net/assets/60fcd1dd-d112-469b-87de-20d39227df3d/WorldEnergyInvestment2024.pdf>

energy technologies (USD 500 billion specifically for RES) and related infrastructure, while approximately USD 850 billion was expected to be invested in fossil fuels. Overall, an analysis of IEA data shows that while investments in fossil fuels have remained relatively stable since 2015, investments in clean energy have increased by more than 50% over the past 9 years. However, S&P Global Commodity Insights provided a less optimistic forecast for 2024, estimating that clean energy technology investments would reach USD 800 billion, with about USD 200 billion allocated to the wind energy sector.<sup>15</sup>

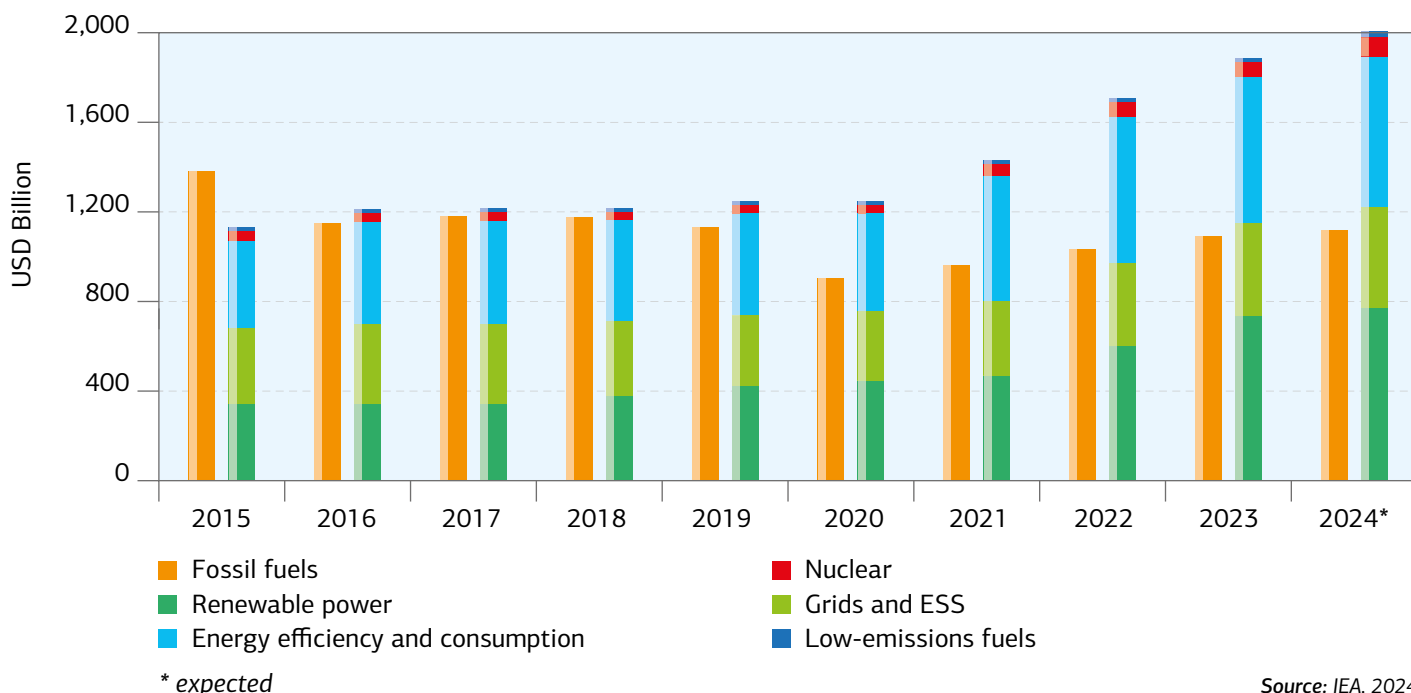
BloombergNEF also concurs with the fact that in 2024, the global transition to clean electricity reached important new milestones. According to its analysis of global semi-annual investments in renewable energy,<sup>16</sup> they increased from less than USD 50 billion in the first half of 2004 to nearly USD 400 billion in the first half of 2024, setting a record for the sector. Of the total USD 400 billion, at least USD 100 billion was invested in wind energy during the first half of 2024, which remains the second-largest sector after solar energy.

Despite the record-setting nature of 2024, tripling global renewable energy capacity by 2030 will require a 12% annual increase in RES investments. However, in another investment forecast, BloombergNEF predicts that by 2050, depending on the scenario, investments in RES will range from USD 181 trillion to USD 215 trillion.<sup>17</sup>

Meanwhile, continuing the IEA's view of RES as the most successful energy transition story in the world, experts from Ember assert that **wind energy is one of the fastest-growing sources of electricity generation in history**, having increased from an annual generation of 100 TWh to 1,000 TWh in just 12 years. "This significantly outpaces gas generation, which reached this level in 28 years, coal in 32 years, and hydropower in 39 years," states the report.<sup>18</sup>

With a total installed capacity exceeding 1,000 GW, wind energy today stands as the world's largest source of renewable electricity and the second-largest source of electricity generation in Europe. According to GWEC,<sup>19</sup> the global wind energy sector experienced its most successful

Figure 1.4. Global investments in clean energy and fossil fuels, 2015-2024



<sup>15</sup> <https://www.spglobal.com/commodity-insights/en/news-research/special-reports/energy-transition/top-ten-clean-energy-technology-trends-2024>

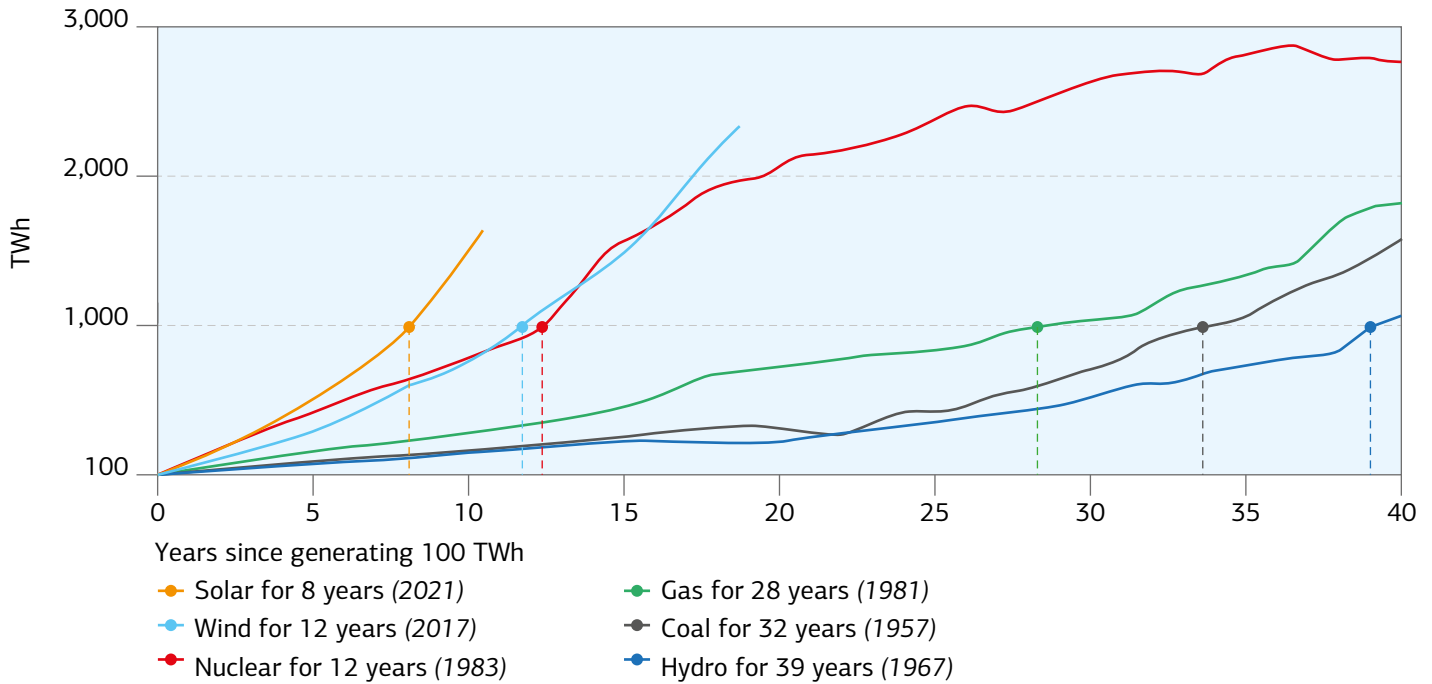
<sup>16</sup> [https://about.bnef.com/blog/clean-electricity-breaks-new-records-renewables-on-track-for-another-strong-year-bloombergnef/?utm\\_source=linkedin&utm\\_content=blog\\_clean-electricity&utm\\_medium=LI\\_BNEF&utm\\_term=14491465281&utm\\_campaign=835924&tactic=835924&linkId=566870933&fbclid=IwZXh0bgNhZWQCMTAAR3gZaXjYVScY09s2goOZGTwnot9cbwCgZ2RScTlq2y9S4RjS3uF1k2BrNw\\_aem\\_JODTMVMC4U5tpnn-kQWvTw](https://about.bnef.com/blog/clean-electricity-breaks-new-records-renewables-on-track-for-another-strong-year-bloombergnef/?utm_source=linkedin&utm_content=blog_clean-electricity&utm_medium=LI_BNEF&utm_term=14491465281&utm_campaign=835924&tactic=835924&linkId=566870933&fbclid=IwZXh0bgNhZWQCMTAAR3gZaXjYVScY09s2goOZGTwnot9cbwCgZ2RScTlq2y9S4RjS3uF1k2BrNw_aem_JODTMVMC4U5tpnn-kQWvTw)

<sup>17</sup> [https://about.bnef.com/new-energy-outlook/?fbclid=IwZXh0bgNhZWQCMTAAR3bv-LmU\\_EjtXwNprkLXLrFLDmZ2vFMVGzMBzL3O59iPnIGvLfmP8chgig\\_aem\\_KeiWl8pJ4wglbPWufWwA#exec-summary](https://about.bnef.com/new-energy-outlook/?fbclid=IwZXh0bgNhZWQCMTAAR3bv-LmU_EjtXwNprkLXLrFLDmZ2vFMVGzMBzL3O59iPnIGvLfmP8chgig_aem_KeiWl8pJ4wglbPWufWwA#exec-summary)

<sup>18</sup> <https://www.carbonbrief.org/wind-and-solar-are-fastest-growing-electricity-sources-in-history/>

<sup>19</sup> [https://gwec.net/wp-content/uploads/2024/04/GWR-2024\\_digital-version\\_final-1.pdf](https://gwec.net/wp-content/uploads/2024/04/GWR-2024_digital-version_final-1.pdf)

Figure 1.5. Growth dynamics of electricity generation from wind compared to other types of generation



Source: Ember, 2024

year on record in 2023, with newly installed wind capacity soaring by an impressive 50% compared to 2022. This unprecedented growth prompted GWEC to revise its forecast for wind energy development by 2030, increasing it by an additional 107 GW. Over the next five years, approximately 791 GW of new wind capacity is expected to come online – 653 GW from onshore and 138 GW from offshore installations – averaging 158 GW of new capacity annually until 2028. By 2029, the world is projected to witness the milestone achievement of 2 TW wind power capacity.

A similar outlook is provided by Rystad Energy<sup>20</sup> which predicts that between 2023 and 2030, global wind capacity will grow at an annual rate of 7%, representing a compound annual growth rate (CAGR) of over 150 GW per year.

Meanwhile, the IEA<sup>21</sup> adopts a more conservative stance, projecting global wind capacity to reach 1.8 TW by 2030 and an extraordinary 6.3 TW by 2050. The IEA also foresees a shift in the balance between onshore and offshore wind energy, with the current 9:1 ratio narrowing to 3:1 by mid-century. Furthermore, the IEA anticipates that wind energy will play a critical role in renewable hydrogen production:

by 2050, 265 GW of onshore and 35 GW of offshore wind capacity are expected to be dedicated to hydrogen production through electrolysis.

At the EU level, where wind energy currently accounts for 20% of electricity consumption, WindEurope projects an increase in wind capacity from today's 225 GW to 350 GW by 2030. However, this remains below the EU's ambitious target of 425 GW by 2030.<sup>22</sup>

According to Rystad Energy, meeting the demand for wind energy technology outside China by 2030 will require more than 30 GW of nacelle production capacity and around 25 GW of blade manufacturing capacity. Additionally, the global supply of wind turbine towers must grow by over 20% from 2023 to 2030. Specifically, the global blade manufacturing capacity should increase from 185 GW in 2023 to 200 GW by the end of 2024, while the tower production capacity is expected to exceed 15 million tonnes in 2024. The IEA notes that despite steady manufacturing capacities for key wind turbine components – nacelles, blades, and towers – remaining at approximately 110-125 GW per year in 2023, these capacities must rise to 120-140 GW annually by 2025 to support projected growth.

<sup>20</sup> <https://www.rystadenergy.com/insights/wind-trends-report-condensed-version>

<sup>21</sup> [https://www.iea.org/reports/renewables-2024?fbclid=IwZXh0bgNhZWQCMTAAROFIszZCKZC00V4hHVHILBA8i6bnKuw0z3muLv2PvySpMVeY0JaFcU\\_va\\_aem\\_37XJEt2VyuVPBZGBv3ee-Q](https://www.iea.org/reports/renewables-2024?fbclid=IwZXh0bgNhZWQCMTAAROFIszZCKZC00V4hHVHILBA8i6bnKuw0z3muLv2PvySpMVeY0JaFcU_va_aem_37XJEt2VyuVPBZGBv3ee-Q)

<sup>22</sup> <https://windeurope.org/newsroom/press-releases/one-year-since-the-european-wind-charter-lots-achieved-lots-more-to-do/>



As of May 2024, GWEC data highlights that the top three global manufacturers are Goldwind, Envision, and Vestas. In Europe, however, the leading players in the wind energy market remain Vestas, Siemens Gamesa, and Nordex Group.

Most international experts agree that the development of resilient supply chains is crucial for the wind energy sector's continued growth. These supply chains must ensure efficient production of wind farm components while reducing reliance on imports. Countries rich in natural resources, such as Brazil, are identified as having significant potential to become leaders in producing wind turbine blades and related components. Realising this potential, however, requires substantial investment in infrastructure, particularly in ports and logistics, as well as effective government support. In 2024, the EU adopted key legislative measures that could serve as examples for other countries, including Ukraine. The Net-Zero Industry Act introduced incentives to bolster domestic manufacturing of wind energy components, reducing reliance on Chinese manufacturers. Similarly, the European Wind Energy Charter obliges EU governments to strengthen the wind energy sector and implement measures outlined in the European Wind Energy Action Plan.<sup>23</sup>

This action plan, which includes 15 immediate steps, aims to enhance the competitiveness of Europe's wind energy value chain.

A critical indicator of the wind energy sector's competitiveness is the LCOE. Globally, wind energy LCOE continues to decline, driven by technological advancements, production process optimization, economies of scale, and reduced financing costs. Investments in infrastructure, such as port terminals for offshore energy, alongside government support in the form of subsidies, grants, and "green" financial instruments, further contribute to lowering costs.

According to the IEA, despite temporary challenges in the global wind energy sector, 96% of new solar PV and onshore wind capacity in 2023 delivered electricity at a lower cost than new coal and gas-fired power plants. Additionally, IRENA reports<sup>24</sup> that from 2022 to 2023, the LCOE for offshore wind fell by 7%, while onshore wind saw a 3% reduction. These trends underscore the growing economic competitiveness of wind energy as a cornerstone of the global energy transition. "New projects deployed in 2023 will deliver a cumulative undiscounted savings of at least USD 409 billion over their operational lifetimes," notes the organization.

<sup>23</sup> <https://windeurope.org/newsroom/press-releases/one-year-since-the-european-wind-charter-lots-achieved-lots-more-to-do/>

<sup>24</sup> [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Nov/IRENA\\_World\\_energy\\_transitions\\_outlook\\_2024.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Nov/IRENA_World_energy_transitions_outlook_2024.pdf)

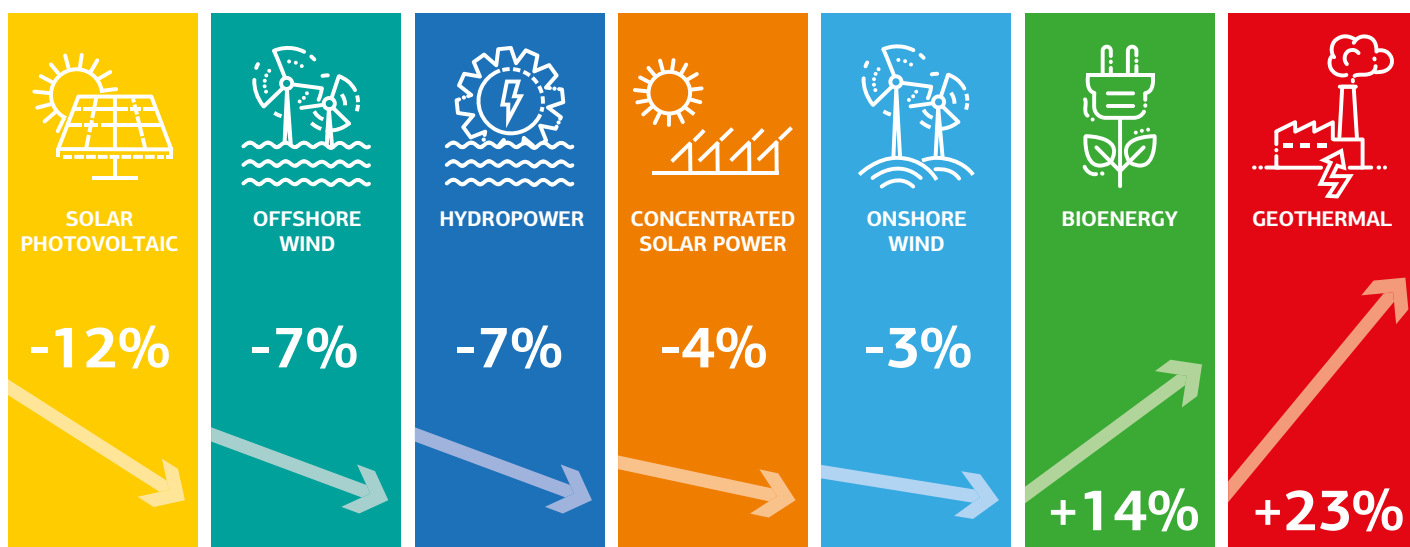
The IEA further forecasts a gradual reduction in the LCOE, predicting that by 2050, the LCOE for onshore wind farms will decline from USD 49 to USD 28 per MWh.

Wind energy remains one of the cornerstone technologies driving the global transition to clean energy, demonstrating rapid capacity growth and increasing competitiveness. Despite existing challenges – such as the need for significant scaling of manufacturing capacity and bridging the gap between current growth rates and ambitious climate targets – the sector holds immense potential to meet COP28 objectives. The decreasing cost of electricity production for both onshore and offshore wind is a critical indicator of the industry’s progress, enabling

new projects to compete directly with traditional coal and gas-fired power plants. Investments in infrastructure, technological advancements, localization of component manufacturing, and government support are paving the way for further cost reductions and the large-scale deployment of wind energy.

However, achieving the ambitious goal of tripling renewable energy capacity by 2030 will require accelerating investment decisions and strengthening national policies. Under such conditions, wind energy will not only maintain its leadership among renewable energy sources but will also make a substantial contribution to a global energy future resilient to the challenges of climate change.

Figure 1.6. Year-on-year percentage change of LCOE, by technology, 2022-2023



Source: IRENA, 2024

# UKRAINE'S ENERGY SECTOR: A SHIFT TOWARD DECENTRALISATION



2024 marks the second year in which the national energy sector has been forced to operate under the conditions of Russia's full-scale war against Ukraine. According to the latest available analysis by the Kyiv School of Economics, as of May 2024, the damages and losses sustained by Ukraine's energy sector due to Russia's full-scale invasion exceeded USD 56 billion<sup>25</sup> with over USD 16.1 billion accounting for direct damages to the energy sector, while more than USD 40 billion – indirect losses in the energy sector. The largest damages were incurred from the destruction of electricity generation objects (USD 8.5 billion) and transmission facilities (USD 2.1 billion).

Over two years of war, at least 18 GW of electricity generation capacity has come under temporary occupation, including the largest nuclear

power plant in Europe – the Zaporizhzhia NPP (6 GW), which, along with other NPPs (+9 reactors), has repeatedly lost external sources of energy supply. Russia has also completely destroyed the Kakhovska and Dniprovskia HPPs, as well as the Zmiivska and Trypilska TPPs.

Unfortunately, the war has also significantly affected the RES sector, as 60% of these facilities were located in five southern regions – Dnipro, Zaporizhzhia, Kherson, Mykolaiv, and Odesa – which are now considered active combat zones. Of the 9.5 GW of renewable energy capacities commissioned on Ukraine-controlled territories before 2022, 25% has come under temporary occupation since the full-scale invasion, including approximately 1.3 GW (71%) of WPPs and 0.6 GW (14%) of the utility-scale SPPs.<sup>26</sup>

**Table 2.1.** Consolidated assessment of damages, losses, and needs of Ukraine's energy sector due to the full-scale invasion of the Russian Federation, as of May 2024

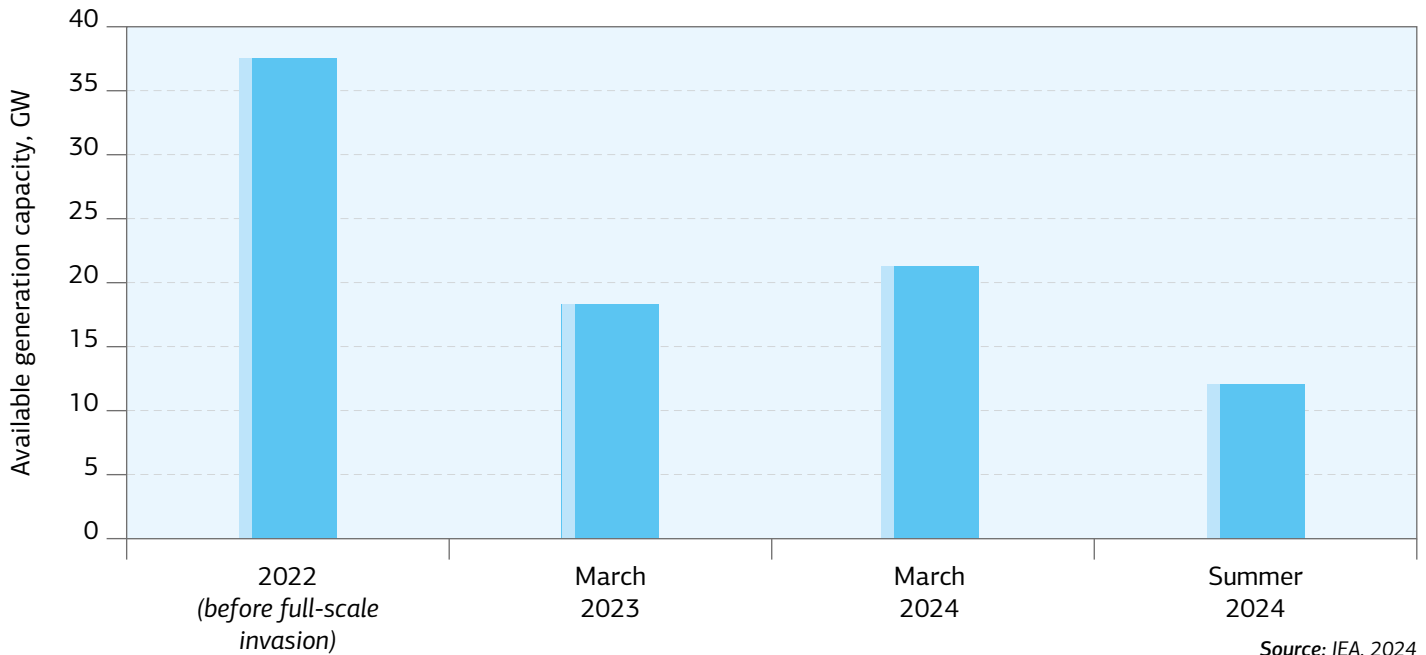
Sector	Damages, USD mln	Losses, USD mln	Needs, USD mln
<b>Electric Power industry:</b>	<b>11,425</b>	<b>18,607</b>	<b>33,839</b>
Electricity distribution	801	3,617	1,930
Electricity transmission	2,100	2,246	2,632
Electricity generation, including:	8,524	12,745	29,277
Combined Heat and Power (CHP)	1,433	1,578	3,525
Thermal Power Plants (TPP)	3,588	3,804	18,131
Nuclear Power Plants (NPP)	843	6,371	1,330
Renewables (RES)	2,661	992	5,671
<b>Oil and Gas Sector, including:</b>	<b>3,331</b>	<b>18,437</b>	<b>14,812</b>
Gas production	-	3,664	183
Gas transmission	775	644	962
Gas distribution	154	1,132	241
Oil production and refining	2,136	12,993	13,106
Storage of oil and petroleum products	67	124	275
Coal Industry	406	676	521
District heating	972	696	1,350
<b>Energy Total</b>	<b>16,135</b>	<b>40,416</b>	<b>50,523</b>

Source: KSE, 2024

<sup>25</sup> <https://kse.ua/ua/about-the-school/news/zbitki-ta-vtrati-energetichnogo-sektoru-ukrayini-vnaslidok-povnomashtabnogo-vtorgnennya-rosiyi-perevishhili-56-mlrd-otsinka-kse-institute-stanom-na-traven-2024-roku/>

<sup>26</sup> <https://www.kmu.gov.ua/storage/app/uploads/public/66b/b80/837/66bb808375c48806179148.pdf>

Figure 2.1. Estimated available electricity generation capacity in specific periods



Despite electricity imports from western neighbours (for instance, in June 2024, total imports to Ukraine amounted to around 2 GW during several hours each day – according to the IEA), in the summer of 2024, Ukraine faced a severe electricity deficit. Generation capacity fell more than 2 GW below peak demand of 12 GW, leaving around 8 million households without power and leading to the second blackout in Kyiv since November 2022.<sup>27</sup>

The structure and level of electricity consumption in Ukraine have significantly changed since 2022 as well. According to the IEA, industrial electricity consumption halved after the invasion in 2022. Although household electricity consumption decreased by 20%, primarily due to the significant number of Ukrainians leaving the country, it now accounts for the largest share of total demand in the system. According to NPC Ukrenergo, during the years of the full-scale invasion, gross electricity consumption in Ukraine’s IPS dropped by 32.3%. At the same time, the TSO reports that the largest shares of electricity consumption in the system are attributed to households (29.0%), industry (26.1%), and municipal and utility consumers (11.0%). Overall, according to EXPRO, Ukraine’s electricity consumption in 2024 amounted to 105,599.3 thousand MWh.

According to the Ministry of Energy of Ukraine, total losses in the energy system during the spring of 2024 amounted to 9 GW of generating capacity, predominantly from TPPs/CHPs, HPPs, and several SPPs<sup>28</sup>. However, in March 2024, it was also reported that 3 GW of additional capacity had been added to the system over the last two years, 600 MW of which came from RES.<sup>29</sup>

In summary, by the end of 2024, Ukraine’s energy balance includes:

- Nine nuclear reactors (7.8 GW) located at three NPPs – Rivne, Khmelnytsky, and Pivdenno-Ukrayinska (which, apart from enemy shelling, periodically stop generating electricity due to necessary planned repairs, although these still account for the lion’s share of electricity generation in Ukraine);
- Several large and small HPPs (however, as of early 2024, the capacity of small HPPs was 193 MW, so the impact of this generation on the energy supply structure is minimal);
- Utility-scale WPPs (604.4 MW);
- BioPPs (around 319 MW as of early 2024);
- Utility-scale and domestic SPPs (around 7 GW, with 1.5 GW from distributed solar)<sup>30</sup>;
- Small WPPs (31 kW as of early 2024);

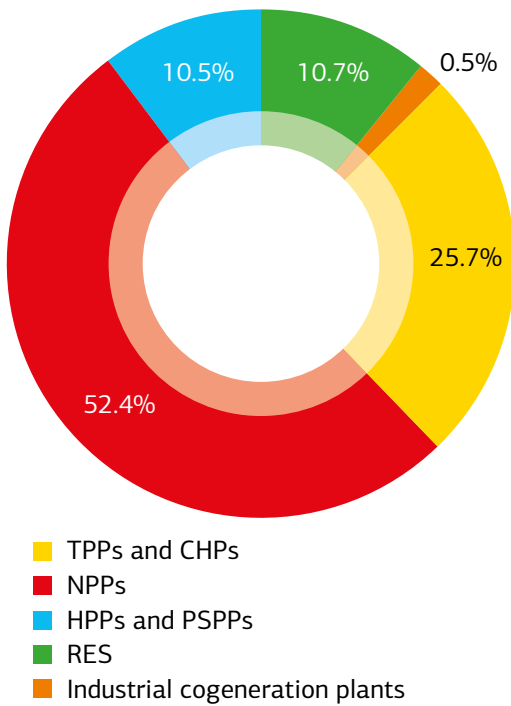
<sup>27</sup> <https://iea.blob.core.windows.net/assets/cec49dc2-7d04-442f-92aa-54c18e6f51d6/UkrainesEnergySecurityandtheComingWinter.pdf>

<sup>28</sup> <https://www.mev.gov.ua/novyna/herman-halushchenko-na-zustrichi-z-poslami-yes-u-vidni-rosiya-khoche-povnoho-blekautu-v>

<sup>29</sup> <https://www.kmu.gov.ua/news/herman-halushchenko-my-vidnovlyi-i-dodaly-do-enerhosystemy-3-hvt-potuzhnosti>

<sup>30</sup> <https://www.kmu.gov.ua/storage/app/uploads/public/66b/b80/837/66bb808375c48806179148.pdf>

Diagram 2.1. Ukraine's Power Mix, 2024



Source: ExPro Consulting, 2025

- Hybrid energy systems (*wind + solar*) for household consumption (245 kW as of early 2024);
- Several autonomous high manoeuvrable gas turbines and gas piston installations.

According to NPC Ukrenergo and EXPRO, in 2024, electricity generation from RES, including WPPs, SPPs, and BioPPs, accounted for 10.9% of total electricity generation in Ukraine's IPS, with households contributing 1.7%. The overall share of RES (*large HPPs included*) in the country's energy mix amounted to 19.9%.

Given the significant damage and losses in Ukraine's energy system over the last two years of war, the short-term solution of covering part of the deficit with autonomous gas turbine and gas piston installations, the long-term and costly construction of new nuclear power generation, and its inability to be instantly restarted "from scratch" after emergency shutdowns, as well as the environmental impracticality of rebuilding or completing fossil fuel-based power plants, the most economically, environmentally, security-wise, and technologically feasible solution is the development of a decentralised energy system based on advanced RES technologies. For this reason, 2024 can be considered a pivotal year marking transformative shifts toward decentralization and the creation

of a more resilient energy system in Ukraine, as evidenced by several decisions, measures, and announced goals from the previous year.

1. On 22 February 2024, the Ministry of Energy of Ukraine presented the Urgent Technologies Catalogue for the Ukrainian Power Sector (*hereinafter referred to as the Catalogue*),<sup>31</sup> developed by the Danish Energy Agency as part of the Ukraine-Denmark Energy Partnership Program on the order of the Ministry of Energy of Ukraine. The Catalogue provides a list of 20 technological solutions that can be rapidly implemented in Ukraine to support distributed generation and improve electricity supply security. The Catalogue offers a detailed description of each technology, its vulnerability to Russian missile and drone attacks, the timeline and implementation stages, its performance during the winter period, and, most importantly, the levelized cost of electricity.

Regarding wind energy, the Catalogue analyzes onshore wind farms with new and used wind turbines with capacities ranging between 20 and 100 MW, autonomous small-scale wind energy clusters from 3 to 20 MW, and wind energy systems for households with capacities ranging from 1 to 25 kW.

According to the results of the conducted analysis, despite some shortcomings, onshore wind energy technology is still considered by the authors as one of the best technologies in terms of economic feasibility (*LCOE over a short period and the entire operational period*), implementation speed, resistance to shelling, and winter period efficiency. Specifically, projects with used wind turbines are identified as the fastest to implement (*within six months*). Moreover, it is noted that when combined with energy storage systems, the levelized cost of electricity generated by wind farms increases by approximately 35%. "The fact that wind turbines are distributed over a large area makes them less vulnerable to aerial attacks from artillery, missiles, or unmanned aerial vehicles," states the Catalogue.

2. On 27 February 2024, the CMU made a long-awaited decision for the renewable energy market and approved the resolution "On the Introduction of Guarantees of Origin for Electricity Produced from Renewable Energy Sources." The resolution provides for the approval of the procedure for issuing, circulating, and redeeming GOs, as well as the procedure for determining the environmental value of electricity from renewables.

<sup>31</sup> <https://mev.gov.ua/storinka/kataloh-krytychno-vazhlyvykh-tekhnologiy-dlya-enerhetychnoho-sektoru-ukrayiny>

On 30 May by the decision of the General Assembly of the Association of Issuing Bodies, Ukraine, represented by the NEURC, acquired the official status of an AIB member. On 06 September the JSC Market Operator presented its software for trading GOs. On 21 October the first auction of GOs was conducted in Ukraine. On 23 December the SE Guaranteed Buyer also participated in the GOs auctions.

- On 01 March 2024, the CMU adopted a resolution to provide clarity regarding the implementation of the market-based support scheme in Ukraine<sup>32</sup> and to simplify the qualification requirements. Thus, instead of a fixed tariff, the Contract for Difference (CfD) mechanism will apply to auction winners, and the list of documents to be provided prior to the bidding stage has been shortened (*land title document, grid connection agreement, etc. to be provided by the auction winner within 6 months*). It also introduced auctions for the construction of RES facilities together with energy storage systems. The pilot “green” auctions took place from October to December 2024, and new quotas for 2025 auctions were announced shortly after (*more details in section 3.2.*)

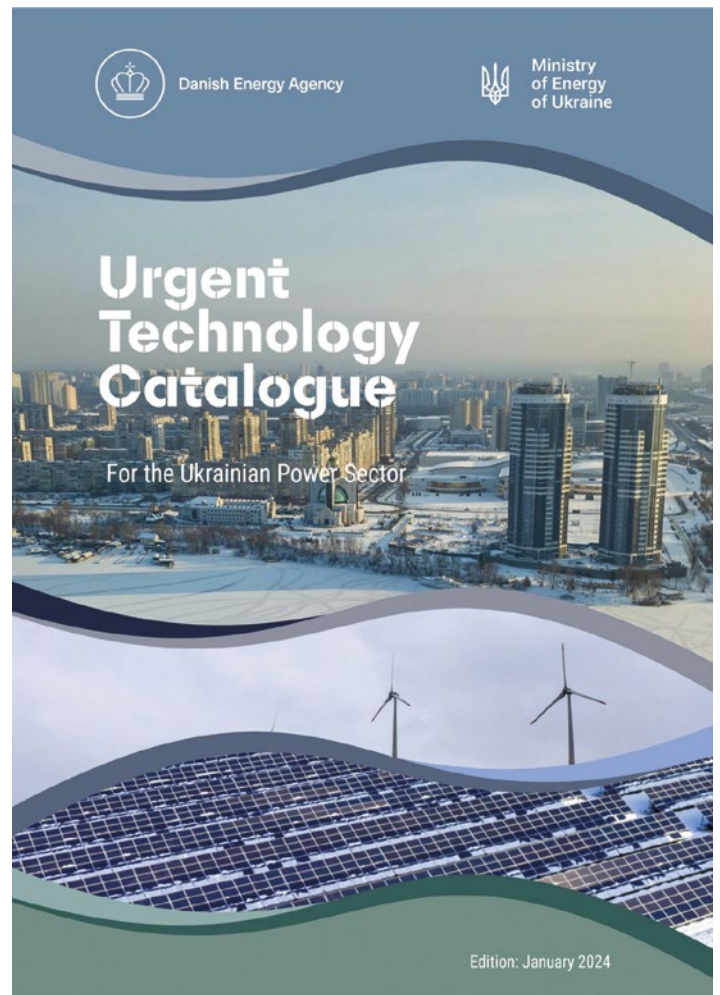
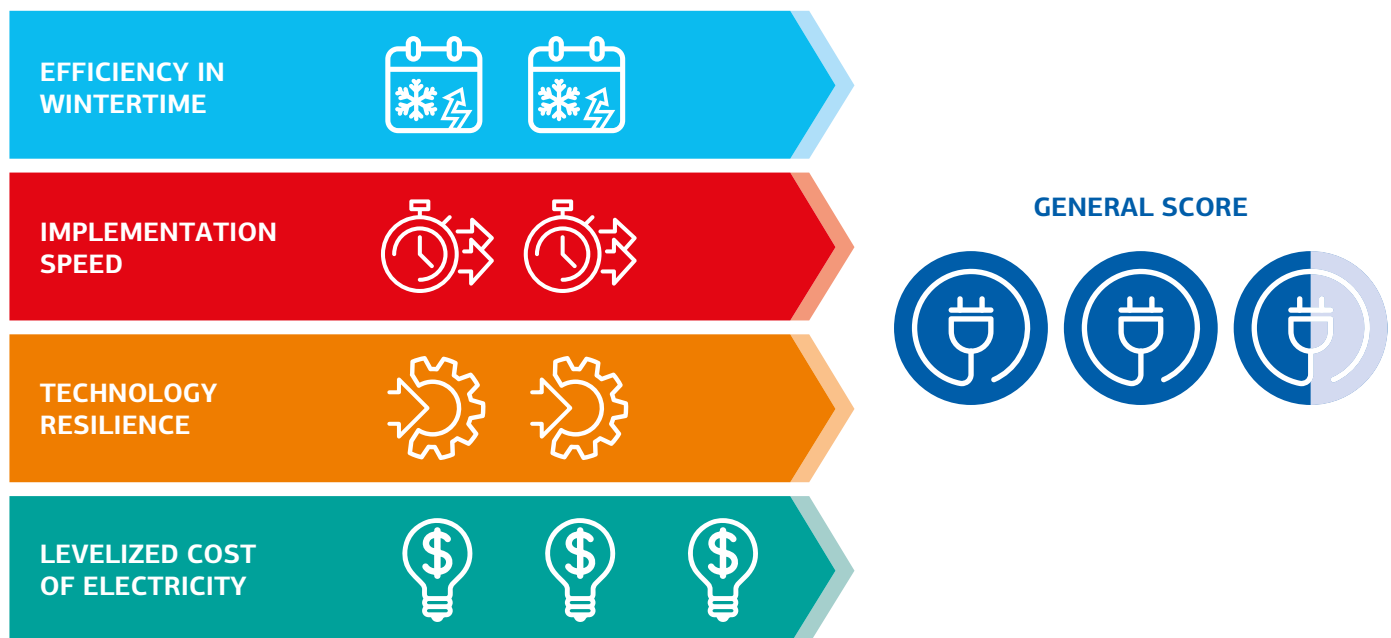


Table 2.2. Onshore wind technology summary, Urgent Technology Catalogue



Source: Ministry of Energy of Ukraine, Danish Energy Agency, 2024

<sup>32</sup> [https://www.kmu.gov.ua/news/uriad-skhalvayv-postanovu-shcho-udoskonaliuie-auktsionnu-model-prodazhu-zelenoi-elektroenerhii?fbclid=IwZXh0bgNhZW0CMTAAR2kerkLwYBezL0ycAyaHRQdtmloQrIEvMRfS\\_1JTUDte-TUVNpIG95fDU\\_aem\\_Zl2On0wXHnV79-uxPNmVHw](https://www.kmu.gov.ua/news/uriad-skhalvayv-postanovu-shcho-udoskonaliuie-auktsionnu-model-prodazhu-zelenoi-elektroenerhii?fbclid=IwZXh0bgNhZW0CMTAAR2kerkLwYBezL0ycAyaHRQdtmloQrIEvMRfS_1JTUDte-TUVNpIG95fDU_aem_Zl2On0wXHnV79-uxPNmVHw)

4. On 19 March 2024, the CMU approved a resolution that allowed the SE Guaranteed Buyer to sell electricity purchased from renewable energy producers not only on the domestic market but also on the European market.<sup>33</sup>
5. On 25 June 2024, the CMU approved the National Energy and Climate Plan for the period up to 2030 (more details in section 2.1.)
6. On 13 August 2024, the CMU approved the National Renewable Energy Action Plan for the period up to 2030 (more details in section 2.2.)
7. Since August 2024, every Ukrainian household also has the opportunity to obtain a no-interest loan from Ukrainian banks for the purchase of solar or wind power installation (ranging from 1 to 10 kW) with energy storage systems (from 1 kWh per 1 kW of installed generation capacity). It is expected that further deployment of renewable energy generation by active consumers will take place within the framework of the Net Billing support mechanism.

International partners and consultants of Ukraine also advocate for the development of a decentralised energy system. In particular, the IEA

states in its report “Energy Security of Ukraine and the Challenges of the Coming Winter”: “Large energy facilities are vulnerable to attacks, and therefore, IEA experts emphasize the importance of developing decentralised energy sources, particularly wind power plants, which provide local energy supply and increase the overall resilience of the energy system.”<sup>34</sup> The Energy Community also called for the “adoption of mechanisms for the construction of decentralised renewable energy generation” in its Roadmap for the development of Ukraine’s renewable energy sector and addressing existing market issues by the end of 2024.

Thus, despite significant successful decisions and steps taken in the development of Ukraine’s energy sector in 2024, the decentralisation process remains a complex and multidimensional challenge that requires further efforts. The key issues that need to be addressed include access to financing and reducing investment risks, uneven development of generation across regions, unfinished legislative reform, the need to preserve and modernise energy networks, and the importance of raising public awareness. Only by systematically addressing these issues can the decentralization course fully realise its potential, ensuring energy security, resilience, and integration of Ukraine into the European energy space.

<sup>33</sup> [https://www.kmu.gov.ua/news/dlia-pidtrymky-zelenoi-heneratsii-uriad-skhalvaly-postanovu-iaka-rozshyriuie-mozhlyvosti-eksportu-elektroenerhii-z-vde-doevropy?fbclid=IwZXh0bgNhZWQMTAAAR3Lj4JIPgU1P0KnqX-BQY-y29nBhtQJt-NCeuB6idtNQNkdxsyemv4Y\\_aem\\_FueEzkB2lJFWfsN15VGWpQ](https://www.kmu.gov.ua/news/dlia-pidtrymky-zelenoi-heneratsii-uriad-skhalvaly-postanovu-iaka-rozshyriuie-mozhlyvosti-eksportu-elektroenerhii-z-vde-doevropy?fbclid=IwZXh0bgNhZWQMTAAAR3Lj4JIPgU1P0KnqX-BQY-y29nBhtQJt-NCeuB6idtNQNkdxsyemv4Y_aem_FueEzkB2lJFWfsN15VGWpQ)

<sup>34</sup> <https://www.iea.org/reports/ukraines-energy-security-and-the-coming-winter>



## DEVELOPMENT OF DISTRIBUTED GENERATION AND THE PATH TO THE EU

During the full-scale armed aggression of Russia against Ukraine, the energy sector became one of the key targets of the enemy due to its strategic importance for the economy and the population's livelihood. No energy system in the world has ever faced such large-scale attacks.

New targeted attacks of critical energy infrastructure, which began on 22 March 2024, caused additional destruction and led to the loss of the majority of thermal and hydro generation capacities. As of the time of writing this Overview, the available capacity of TPPs and CHPs stands at less than 20% of the pre-invasion level, while the capacity of HPPs and PSPPs has decreased by 50% over the same period.

Given the scale of destruction to the existing generating capacities and the necessity to decentralize generation to enhance the resilience of the energy system, there is an urgent need for the accelerated construction or deployment of new distributed generation facilities.

Thus, by Resolution No. 713-r dated 18 July 2024, the CMU approved the **Distributed Generation Development Strategy for the period up to 2035**, developed by the Ministry of Energy of Ukraine, and endorsed an operational action plan for its implementation during 2024–2026. This Strategy identifies wind energy as one of the key directions for the development of distributed generation, whose implementation will help address the issue of generating capacity deficit in Ukraine's Integrated Power System.

Concurrently, the Government adopted a series of strategic documents aimed at the development of RES in the medium term. In particular, by Resolution No. 587-r dated 25 June 2024, the CMU approved the National Energy and Climate Plan for the period up to 2030 (NECP), developed in accordance with the requirements of EU Regulation 2018/1999.

Moreover, by Resolution No. 761-r dated 13 August 2024, the CMU approved the National Renewable Energy Action Plan for the period up to 2030 (NREAP), along with an action plan for its implementation.

Both documents aim to achieve a 27.1% share of RES in gross final energy consumption by 2030, including 29.4% in the electricity sector, in accordance with the decision of the Energy Community Ministerial Council No. 2022/02/MC-EnC. The latter document also specifies that by 2030, the installed capacity of wind energy should reach 6,214 MW, including 100 MW of offshore wind farms, which will require USD 5.3 billion in private investments.

Thus, at the national level, an ambitious goal has been set – to increase Ukraine's total wind energy capacity by more than 4 GW by 2030. Therefore, **wind energy has been identified as the most promising renewable energy source for development in Ukraine.**



**Mykola Kolisnyk,**  
Deputy Minister of Energy  
of Ukraine



*“The development of distributed generation, particularly wind energy, is key to Ukraine's energy independence and security. Utilizing our natural resources in combination with local initiatives enables the creation of a flexible, challenge-resistant energy supply system. Wind energy is one of the key technologies for restoring energy infrastructure and providing communities with clean, affordable electricity. Every new wind turbine is not only a contribution to decarbonization but also support for Ukraine's economy and technological development in the post-war period.”*

In addition to the above, at the end of 2024, regional military administrations, in coordination with the Ministry of Energy and the Ministry of Community and Territorial Development of Ukraine, developed regional energy resilience passports, which were approved by a joint order of these ministries. Passports are regional-level documents that define ways and mechanisms for ensuring reliable energy supply to consumers through the development of various types of distributed generation, including wind.

Further development of renewable energy in Ukraine, aimed at achieving the goals of the NECP, NREAP, implementation of the tasks of the Distributed Generation Strategy, and ensuring energy sustainability of the regions, is planned to be carried out on a competitive and market basis. **The state will facilitate this by creating conditions for attracting private investments.**

In addition, during 2024, the implementation of the provisions of the Law of Ukraine No. 3220-IX "On Amendments to Certain Laws of Ukraine on the Restoration and "Green" Transformation of the Energy System of Ukraine" was completed. Key innovations of 2024 include:

#### **1. Launch of the mechanism for issuing GOs for electricity from renewables**

To this end, the CMU approved Resolution No. 227 dated 27 February 2024, developed by the Ministry of Energy of Ukraine and NEURC. The Resolution approves the procedure for issuing, circulating and cancellation GOs of electricity, as well as the procedure for determining its environmental value. In October 2024, the NEURC issued the first GOs, after which regular trading began. In parallel, the Government is working on the recognition of Ukrainian guarantees of origin in the EU.

The Ministry of Energy also approved the environmental value of electricity from renewable sources: for 2024 – 1,232.84 kg of CO<sub>2</sub>-equivalent per 1 MWh, for 2025 – 1,278.55 kg of CO<sub>2</sub>-equivalent per 1 MWh.

#### **2. Launch of "green" auctions**

To this end, the CMU approved Resolution No. 232 dated 01 March 2024, developed by the Ministry of Energy of Ukraine. The Resolution introduced a CfD model instead of fixed tariffs, simplified the requirements for participants, and provided for the possibility of auctions for the construction of RES facilities together with energy storage systems. In the summer, the Government adopted Resolution No. 757-r dated 13 August 2024 on holding three pilot auctions with a capacity of 110 MW (*including 88 MW for wind energy*).

Pilot auctions in the fall identified one winner for the small hydropower project, while others did not attract enough participants. Based on the analysis, the Ministry of Energy is preparing measures to increase the attractiveness of the auctions. Two auction sessions for wind power are planned for 2025 (*100 MW in April and 150 MW in July*) with a quota of 250 MW and a maximum price of 8 euro cents per kWh.

#### **INTEGRATION OF THE UKRAINIAN ENERGY SECTOR WITH THE EU**

Synchronization of legislation in renewable energy with EU norms remains one of Ukraine's top priorities. The European Commission, in its enlargement package, assessed Ukraine's progress in the energy sector at 4 out of 5 points.

The provisions of EU Directive 2018/2001 on the promotion of renewable energy are planned to be implemented in 2025. The Ministry of Energy of Ukraine has also developed a draft law that takes into account the update to RED III (*EU Directive 2023/2413*) and the implementation of the relevant Delegated Regulations, in particular 2021/2003, 2022/342, 2019/807, 2022/759, 2023/1184, 2023/1185. The document has been agreed with the authorities and market participants, and its submission to the Parliament is expected shortly.

Additionally, it is planned to identify renewables acceleration areas in Ukraine and simplify permitting procedures for construction and connection to networks, in accordance with the requirements of EU Directive 2018/2001.

# 2.1. NATIONAL ENERGY AND CLIMATE PLAN FOR THE PERIOD UP TO 2030

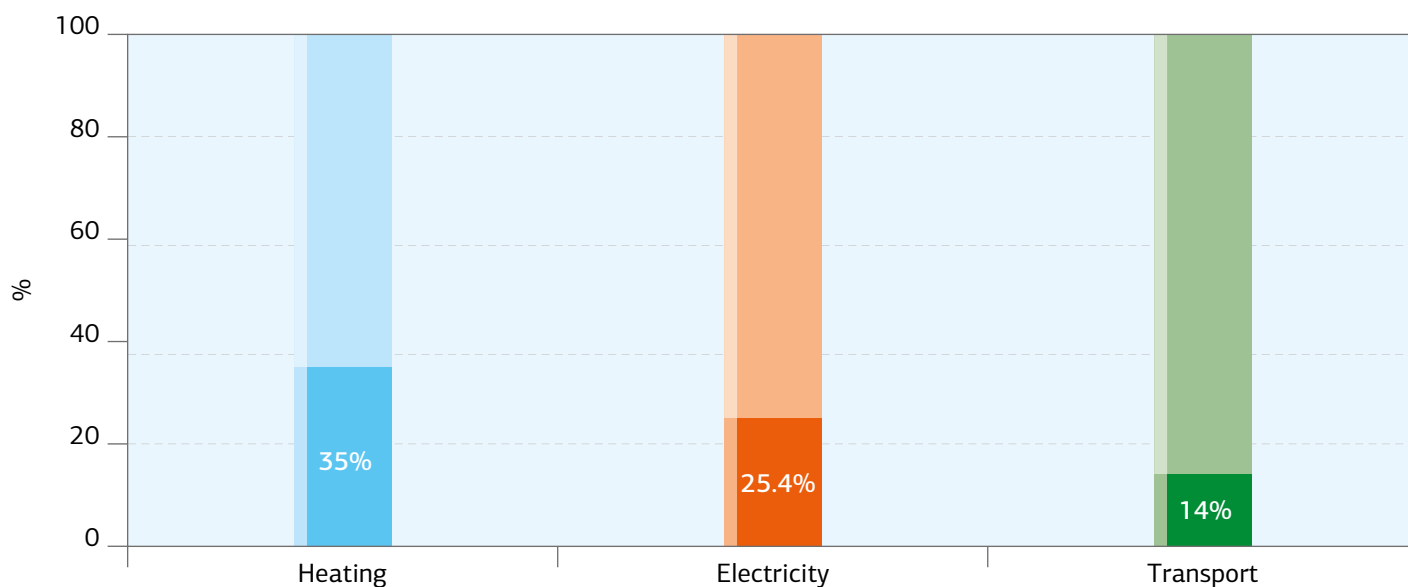
**AUTHOR:** Anzhelika Livitska,  
Partner, ARZINGER

On 25 June 2025, the Ukrainian Government approved the National Energy and Climate Plan for the Period up to 2030<sup>35</sup> (NECP) developed with the active engagement of more than 1,500 representatives of various sectors and stakeholders, including the Government, Parliament, European partners, civil society, the public sector, and local communities. The plan envisages attracting USD 41.5 billion in investments to decarbonise the economy.

As part of the NECP, the National Renewable Energy Action Plan for the period up to 2030 was also approved in August 2025, which sets out renewable energy development trajectories by sector until 2030 with measures for their implementation, considering the policies and measures defined by the NECP.

The preparation of NECP is Ukraine's obligation under the Treaty establishing the Energy Community, in line with the requirements of Regulation (EU) 2018/1999 and the relevant methodological recommendations of the European Commission (Regulations N° 663/2009 i N° 715/2009, Directives 94/22/EU, 98/70/EU, 2009/31/EU, 2009/73/EU, 2010/31/EU, 2012/27/EU i 2013/30/EU, 2009/119/EU and 2015/652 N° 525/2013). The document was also supposed to be prepared under the orders of the President of Ukraine from 08 November 2019, No. 837/20192, and 23 March 2021, No. 111/2021. In addition, the development and approval of NECP is a condition for the distribution of financial assistance from the EU under the Ukraine Facility. The NECP's key targets include reducing greenhouse gas emissions, increasing the share of RES in total final energy consumption, deepening the diversification of energy sources and supply routes, and improving energy efficiency.

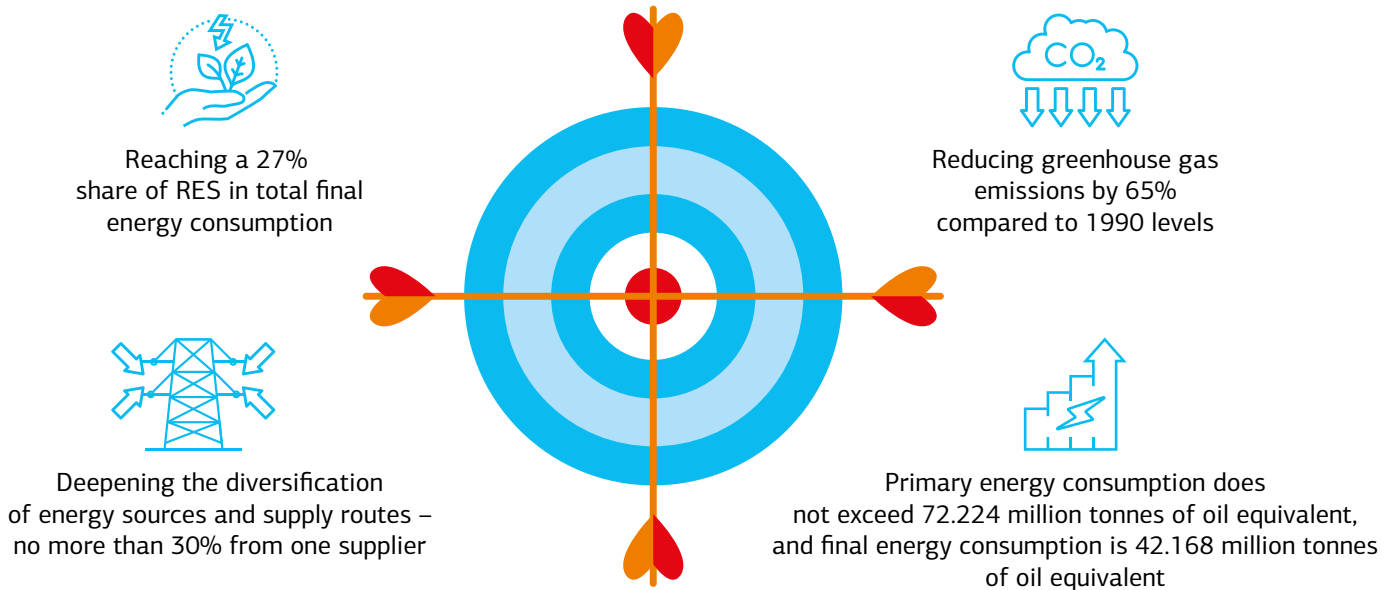
Figure 2.1.1. RES share per sector in Ukraine by 2030 under NECP



Source: PU UWEA, 2024

<sup>35</sup> <https://me.gov.ua/Documents/Detail?lang=uk-UA&id=17f558a7-b4b4-42ca-b662-2811f42d4a33&title=NatsionalniiPlanZEnergetikiTaKlimatuNaPeriodDo2030-Roku>

Picture 2.1.2. TOP-4 goals of the National Energy and Climate Plan until 2030



Source: PU UWEA, 2024

Much attention is paid to fulfilling Ukraine's international commitments, including harmonization with EU law, environmental protection, sustainable development, and further liberalization of the electricity market.

It is worth noting that, in addition to the general goal of delivering an overall RES share in gross final consumption of at least 27% by 2030, the NECP also sets targets for the share of renewable generation in certain sectors of the economy, namely

- heating and cooling – 35%;
- electricity – 25.4%; and
- transport – 14%.

The NECP also envisages the development of a FiT model to support electricity generation to cover the electricity consumption of active consumers (*prosumers*).

The NECP sets another new and important task – to ensure **the deployment of energy storage systems in Ukraine**.

Ukraine's energy storage market is at an early stage of development (*at the time of writing this overview, only two industrial ESSs with a capacity of 1 MW each are operating in the IPS of Ukraine*). Since the renewable energy capacities installed in Ukraine until 2023 are based on technologies which power generation profile depends on weather conditions (*especially wind and solar*), the grid infrastructure is planned to be expanded and the ESS market is expected to be developed.

According to the Energy Strategy of Ukraine, the strategic targets until 2025 include the widespread deployment of energy storage technologies with further expansion of their use in the next time horizons. It is also planned to create incentives/ attractive market environments for the investors to construct utility-scale ESSs. In particular, long-term contracts for ESS services may be introduced.

Energy storage activities are also provided for in the basic Law of Ukraine "On the Electricity Market". The Regulator has approved the licensing conditions for energy storage activities. To simplify the permitting procedure, the licensing conditions specify cases where ESS does not require licensing.

Moreover, to simplify the procedure for connecting ESS to the networks during the period of martial law, according to the Procedure for Temporary Connection of Electrical Installations to the Distribution System During the Period of Martial Law in Ukraine, until 01 January 2025, the DSO provided an ESS connection without paying a grid connection fee. The development of relatively small ESSs will be partially stimulated, in particular, as a **part of the State Economic Programme to Stimulate the Development of Distributed Generation from RES for the period up to 2030**.

From the market perspective, the ESS operator (*as well as the aggregator*) can buy and sell electricity on the electricity market on a non-discriminatory basis, taking into account responsibility for imbalances, as well as provide balancing and ancillary services.

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To ensure the proper preconditions for the development of ESS, the problem of accumulated debts in the balancing electricity market must be resolved.

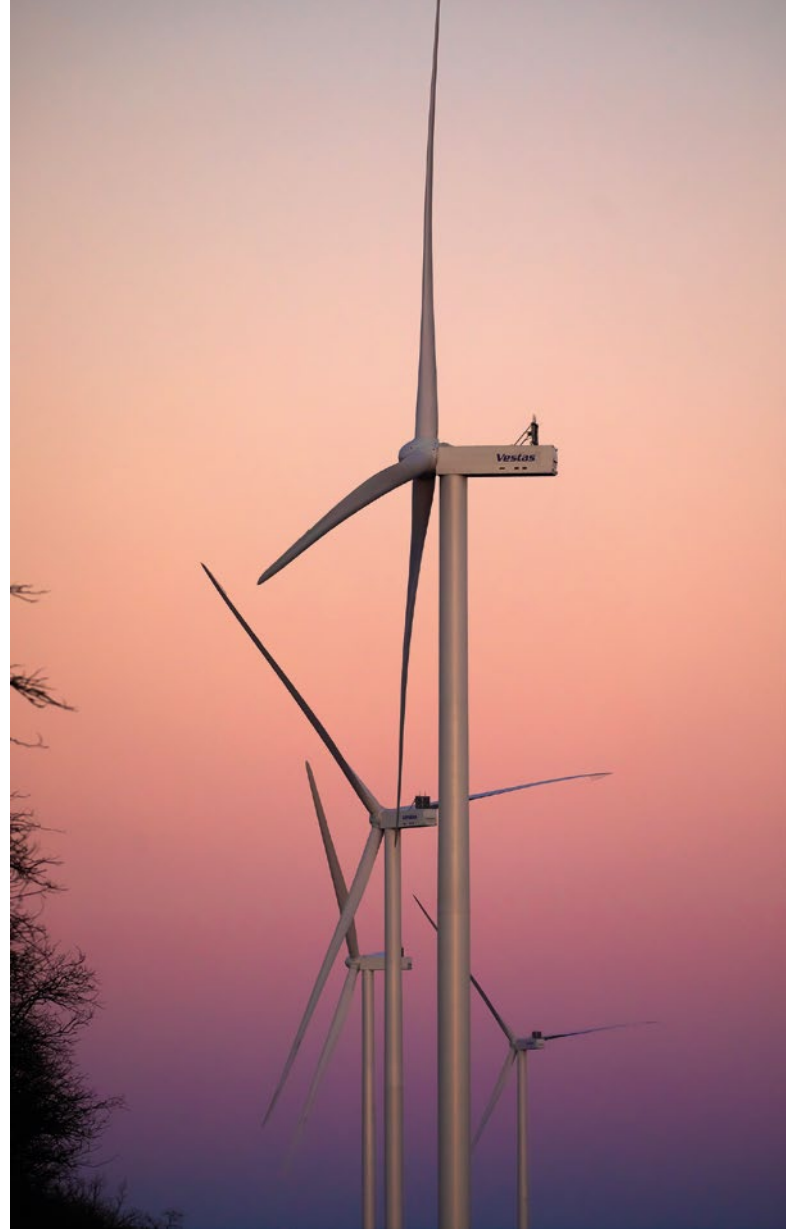
To increase the flexibility of the energy system, as part of the implementation of the EC Electricity Integration Package, it will be possible for the ESS operator to provide DSO flexibility services.

In addition, the Government approved the conditions for the tender for the construction of generating capacities and the implementation of demand management measures. This will increase the integration of “green” generation and enhance the reliability of the power system functioning and its further development. In particular, it is planned to hold tenders for constructing facilities totalling 700 MW, with a unit capacity ranging between 5 MW and 80 MW each. The respective facilities are to be commissioned by the end of 2027.

\*\*\*

The adoption of the NECP is a pivotal step toward ensuring the sustainable development of Ukraine’s energy sector and addressing the global challenges posed by climate change. This document establishes a strategic framework for achieving energy security, reducing dependence on fossil fuels, lowering greenhouse gas emissions, and transitioning to clean energy sources.

The NECP offers a comprehensive approach to energy policy, aligning objectives in energy efficiency, renewable energy development, decarbonization, modernization of the energy system, and integration into the European energy space. It supports not only Ukraine’s fulfilment of international commitments but also fosters investment in cutting-edge technologies, enhances economic competitiveness, and improves citizens’ quality of life.



Thus, the NECP is more than a technical document; it serves as a strategic roadmap guiding Ukraine toward a climate-neutral future, energy independence, and sustainable growth. Timely implementation of its provisions and measures must be a top priority for national policy.

## 2.2. NATIONAL RENEWABLE ENERGY ACTION PLAN FOR THE PERIOD UP TO 2030

On 13 August 2024, the Government of Ukraine approved the **National Renewable Energy Action Plan for the Period up to 2030 (NREAP)**<sup>36</sup> – a strategic document outlining 38 measures to achieve a 27% share of renewables in gross final energy consumption. This target aligns with the Energy Strategy of Ukraine to 2050, adopted on 21 April 2023, and the National Energy and Climate Plan to 2030, approved on 25 June 2024.

The development and adoption of the NREAP were driven by global energy and climate goals focused on decarbonisation and sustainable development, adherence to European regulatory directives and regulations as Ukraine progresses toward EU membership, and the critical energy generation deficit caused by sustained large-scale attacks on Ukraine's national energy infrastructure by Russia since 2022. Key factors influencing the establishment of national renewable energy targets included the Paris Agreement, ratified by Ukraine in 2016, and Ukraine's commitments in 2021 to implement the EU's Fourth Energy Package "Clean Energy for All Europeans," including Directives (EU) 2018/2001 and 2023/2413 on promoting renewable energy use.

The first NREAP was adopted by the CMU on 01 October 2014 (Order No. 902). This document set a clear national indicative target: increasing the share of renewables in gross final energy consumption to at least 11% by 2020. By the end of 2020, the share of renewables in Ukraine's electricity generation reached 13.9%, including contributions from large HPPs. However, this achievement was marked by a disproportionate distribution across renewable energy sources. Solar energy development exceeded its targets nearly threefold, while wind energy lagged 40% behind its goals, and bioenergy fell short by 80%. Consequently, the wind energy market deemed the NREAP results up to 2020 unsatisfactory.

The NREAP approved last year, sets more ambitious targets for the sector, fostering hope for compensating prior underperformance. It aims to increase electricity generation from RES to 43,894 GWh by 2030, equivalent to 3,374 thousand TOE. The document encompasses a diverse range of RES technologies, including hydropower (*both under and over 10 MW*), solar energy, wind energy (*onshore and offshore*), bioenergy (biogas and biomass), geothermal energy, renewable gases (*hydrogen*), and various RES systems for household needs, such as solar, wind, or hybrid systems.

Thus, the NREAP outlines the following capacity targets for each type of RES by 2030:

- **Hydropower:** 4.7 GW
- **Bioenergy:** 876 MW (475 MW for biomass and 401 MW for biogas)
- **Geothermal energy:** 40 MW
- **Solar energy:** 12.2 GW, with 5 GW from distributed solar PV systems
- **Wind energy:** 6.2 GW or 17,455 GWh, including 6.1 GW for onshore wind and 0.1 GW for offshore wind. *It is crucial to note that as long as the Black Sea and Azov Sea remain zones of active military actions, achieving the offshore wind energy target is unattainable and may be deferred indefinitely.*

The plan also emphasizes the development of energy storage systems, a segment identified as critical for balancing the grid. This focus aligns with the target scenario outlined in the Generation Adequacy Assessment Report by NPC Ukrenergo, approved by the NEURC (Resolution No. 337, February 20, 2024). The scenario calls for constructing at least **656 MW** of energy storage systems in Ukraine by 2030. Notably, in 2023, NPC Ukrenergo issued a record 11 technical conditions for connecting such systems to the grid.<sup>37</sup> To stimulate the energy storage sector, the Government of Ukraine has implemented a series of pivotal measures, including:

<sup>36</sup> <https://www.kmu.gov.ua/storage/app/uploads/public/66b/b80/837/66bb808375c48806179148.pdf>

<sup>37</sup> <https://forbes.ua/money/veliki-i-duzhe-dorogi-batareyki-u-2023-mu-okko-kness-ta-inshi-kompanii-otrimali-mozhlivist-zbuduvati-sistemi-zberezheniya-energii-na-zagalnu-sumu-ponad-500-million-khto-mozhe-stvoriti-noviy-dlya-ukraini-r-13022024-19147>



establishing the legal, economic, and organisational framework for the market through the adoption of Law No. 2046-IX “On Amendments to Certain Laws of Ukraine Regarding the Development of Energy Storage Systems” on 15 February 2022; amending the Transmission System Code, Distribution System Code, and Commercial Metering Code; and providing financial incentives for connecting such systems via the Law “On Certain Issues Related to the Use of Electric Vehicles and Amendments to Certain Laws of Ukraine to Overcome Fuel Dependency and Develop Charging Infrastructure and Electric Vehicles”.<sup>38</sup> These and other decisions have spurred Ukrainian companies to plan or initiate relevant projects.

Among the most active players in this area are such UWEA member companies as **KNESS** and **DTEK Renewables**, although **DTEK** is considered the pioneer in the field. In May 2021, DTEK installed Ukraine’s first industrial lithium-ion energy storage system with a capacity of 1 MW and 2.25 MWh at the Zaporizhzhia TPP site in Enerhodar. However,

the first energy storage license in Ukraine was granted in 2023 to Budpower, a subsidiary of KNESS, which operates a 1 MW industrial energy storage system.

In 2024, NPC Ukrenergo conducted the country’s first long-term auctions for procuring ancillary services, with DTEK Renewables emerging as one of the winners. Shortly afterward, DTEK announced a EUR 140 million investment in constructing a 200 MW energy storage and accumulation system, scheduled to be operational no later than September 2025.<sup>39</sup>

The NREAP also aims to address the issue of disproportionate development of new “green” generation across regions. The document highlights that, over the next decade, priority for renewable energy development should be given to regions with underdeveloped capacities and energy deficits. This goal is to be supported by region-specific auctions as stipulated by the Law of Ukraine “On Alternative Energy Sources.” The plan states: “*The prioritization of renewable energy development in specific regions will be determined annually during the process of forming proposals for approving annual quotas for renewable energy support, the auction schedule for the upcoming year, and indicative forecast figures for annual support quotas for the four years following the year for which the annual quota is established.*”

In addition to technological, geographical, regional, and economic factors, the calculation of Ukraine’s renewable energy target for 2030 also considers the provisions of the National Economic Strategy for the period up to 2030 (*adopted on 03 March 2021*) and Ukraine’s Nationally Determined Contribution under the Paris Agreement.

Separately, measures to develop distributed generation from renewables, including by active consumers, are outlined in the Strategy for Distributed Generation Development, while priorities for hydrogen production and utilisation will be defined in Ukraine’s Hydrogen Strategy until 2050.

<sup>38</sup> The law stipulates that until 01 January 2025, the calculation of the fee for connecting ESS to the TSO / DSO grids includes only the component covering the creation of the linear part of the connection.

<sup>39</sup> <https://dtek.com/media-center/news/dtek-to-invest-140-million-in-energy-storage-systems-to-strengthen-ukraines-energy-secur/>

# ||| UKRAINE'S WIND ENERGY SECTOR: ACHIEVEMENTS AND CHALLENGES



## 3.1. KEY MARKET TRENDS AND WIND ENERGY PROJECTS

On the threshold of the third year of the full-scale war, the national wind energy industry continues to develop, albeit slowly. In contrast to last year, 2024 was a rather modest year regarding new wind power capacity additions. Whereas in 2023, despite problems with logistics and construction caused by active hostilities, an additional 146.3 MW of wind power capacity was commissioned, namely: Phase 1 (114 MW) of the 500 MW Tyligulska wind farm, Phase 2 (60 MW) of the 100 MW Dnistrovska wind farm in the Odesa region, and 43.6 MW of Skolivska wind farm in the Lviv region, **only slightly more than 20 MW** was added to the Ukrainian power system in 2024. It includes two turbines with a unit capacity of 5.5 MW each at the aforementioned Skolivska wind farm and the first two 4.8 MW wind turbines at the Ostrovsky wind park thus bringing the total to **1,921.4 MW** (including wind farms located in the temporarily occupied territories of Ukraine, excluding wind facilities in the Autonomous Republic of Crimea).

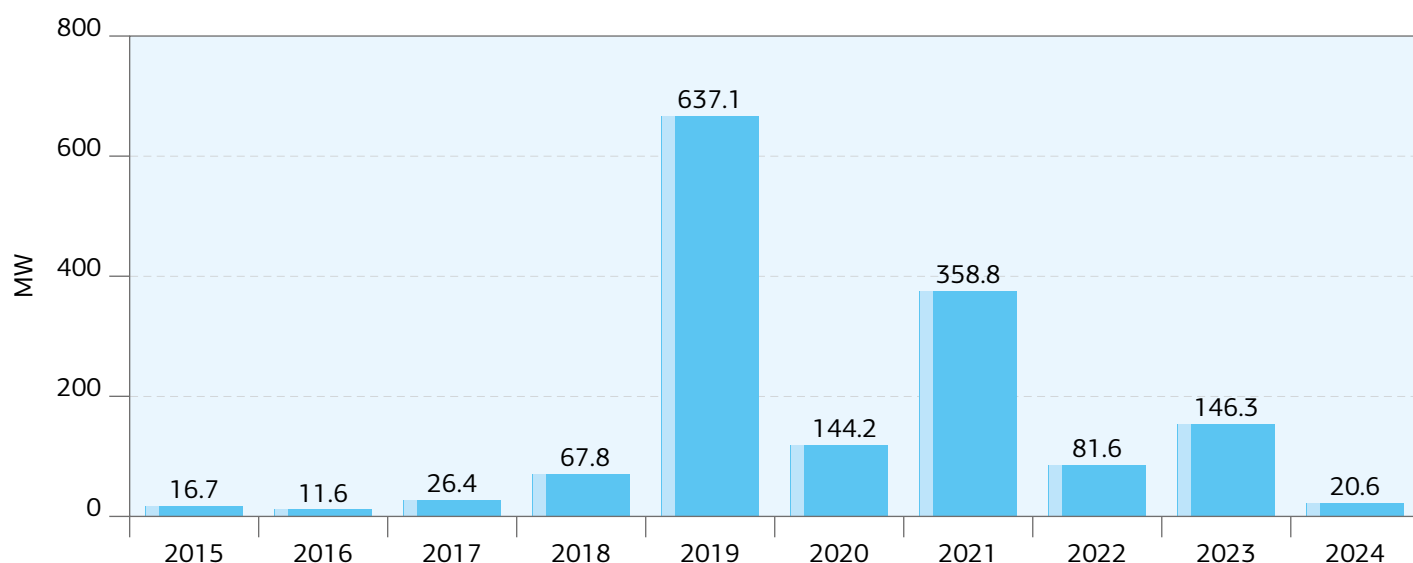
The protracted crisis in the national RES market, particularly the wind energy sector, which has been ongoing for the past five years and was

exacerbated in 2022 by military risks, directly contributes to this negative trend. The UWEA has repeatedly emphasised its complex nature related to the inefficiency of market-based mechanisms to promote renewables and regulatory imperfections.

Thus, the problem of accumulated debts to RES electricity producers remains relevant for the Ukrainian electricity market, which, according to various estimates, amounted to UAH 35 – 38 billion at the beginning of December 2024. It should be noted that at the end of the year, the debt settlement situation improved slightly, primarily due to the repayment of SE NNEGC Energoatom’s debts for household PSO.

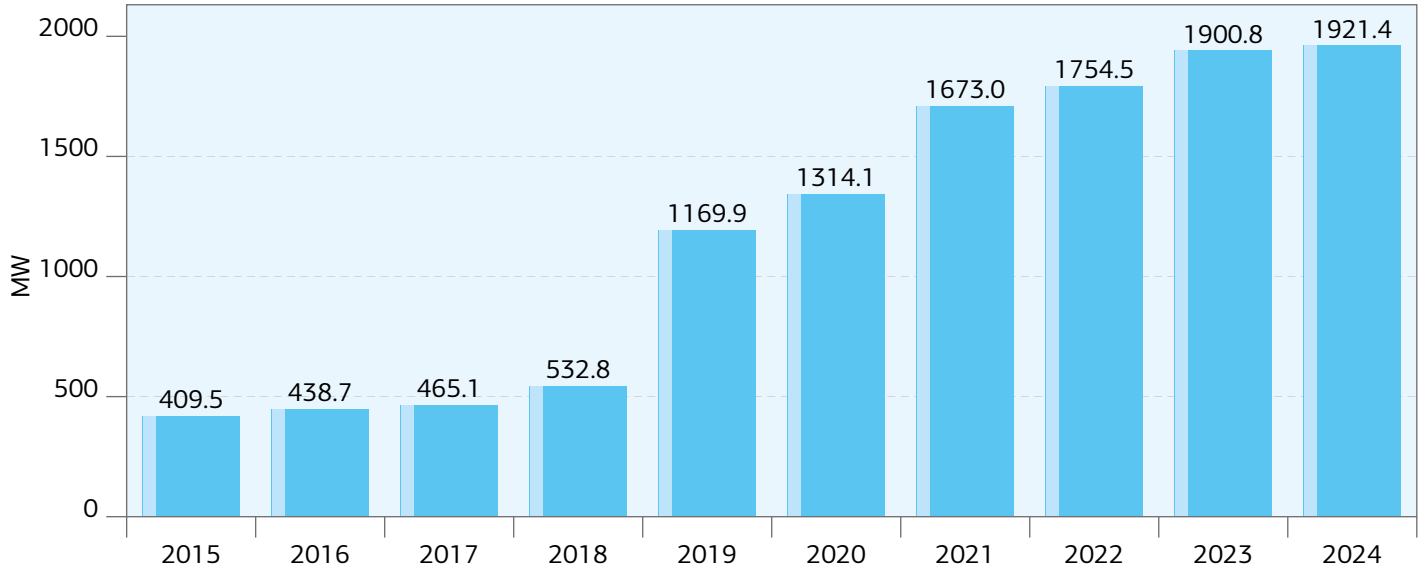
In addition, the UWEA expects more positive dynamics in terms of debt settlement in 2025, as on 19 December 2024, the NEURC, by its Resolution on setting the NPC Ukrenergo electricity transmission tariff for 2025, for the first time in many years, approved the transmission tariff rate at a deficit-free level, namely at UAH 686.23/MWh. In January 2025, the Verkhovna Rada approved in the second reading Draft Law No. 9381 “On Amendments to

Figure 3.1.1. Annual wind additions, 2015–2024



Source: PU UWEA, 2024

Figure 3.1.2. Total installed wind capacity, mainland Ukraine, 2015–2024



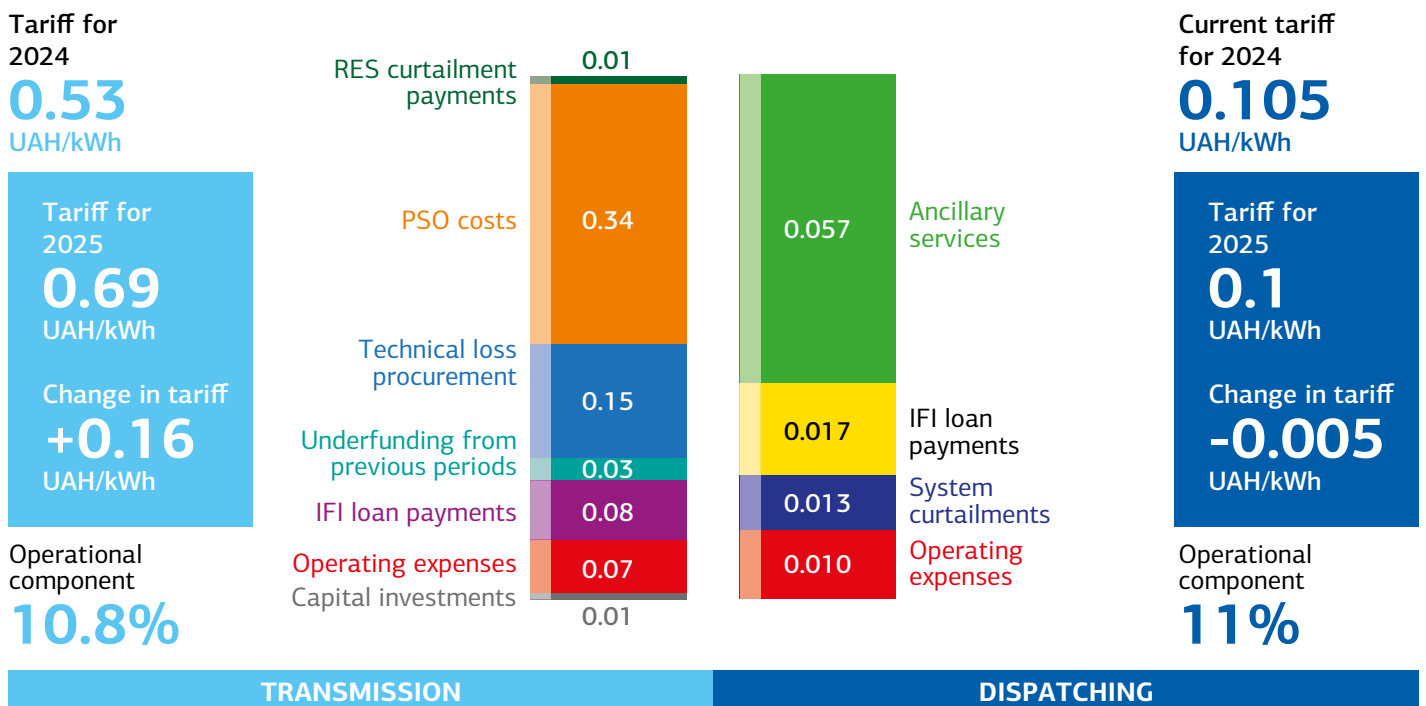
Source: PU UWEA, 2024

Certain Laws of Ukraine in the Field of Energy and Heat Supply Regarding the Clarification of Provisions Related to Effect of Martial Law in Ukraine”, which, inter alia, provides for allocating about UAH 10 billion NPC Ukrenergo’s excess income gained from dispatch (*operational and technological*) management in 2023 and 2024 to repay debts in the electricity market, 45% of which should be allocated to cover costs and debts under the FiT. Although these decisions sent a positive signal regarding resolving

the issue, the fact that this problem has remained unsolved for so many years and that the Government has not focused on finding a solution over a long time has negatively impacted the investor’s trust, declining their confidence in the market.

The failure of the pilot “green” auctions held in autumn 2024 was quite illustrative. Though this result was quite expected, the UWEA has been highlighting the complex problem of **ineffective mechanisms** for

Figure 3.1.3. NPC Ukrenergo Tariffs for 2025, UAH/kWh, VAT excluded



Source: NPC Ukrenergo, 2024

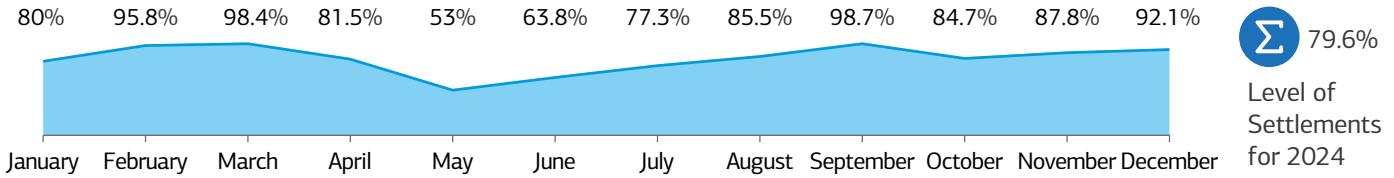
Figure 3.1.4. Level of settlements to RES electricity producers under the “green” tariff as of 16 January 2025

Debt of NPC Ukrenergo

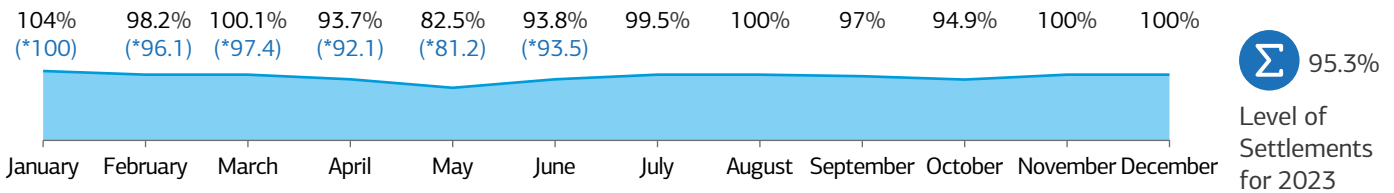
Σ UAH 22.08 billion

- Debt of NPC Ukrenergo for the Service from January to December 2024 (excluding June Service adjustments for imbalance settlements and deviation costs)

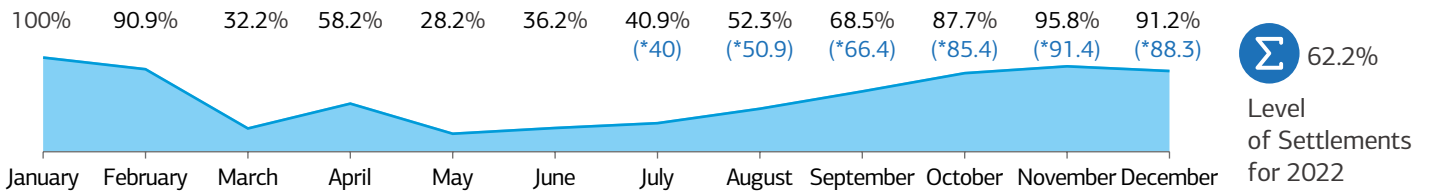
Electricity Payments from 01 January 2024 to 31 December 2024 (Monthly Breakdown)



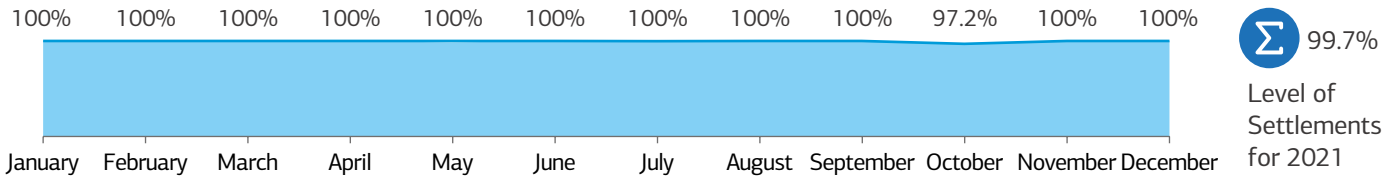
Electricity Payments from 01 January 2023 to 31 December 2023 (Monthly Breakdown)



Electricity Payments from 01 January 2022 to 31 December 2022 (Monthly Breakdown)



Electricity Payments from 01 January 2021 to 31 December 2021 (Monthly Breakdown)



\* Payment percentage (excluding payments to be refunded to RES, adjusted by NPC Ukrenergo in accordance with commercial accounting data, as per NEURC Resolution No. 759 dated 19 April 2024)

Source: SE Guaranteed Buyer, 2025

supporting RES generation regularly since 2019. First, the Government’s attention was drawn to the problem of a discriminatory approach to setting the level of the feed-in tariff for different types of RES generation, and later, after its cancellation, to the lack of a sustainable European practice of “green” auctions in Ukraine. Even though the relevant Law of Ukraine No. 2712-VIII “On Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources” (the “green” auction law) was adopted on 25 April 2019, the pilot “green” auctions took place only 5 years later. During the 5-year time, the procedure was repeatedly amended. Given the limited quotas that did not meet the actual needs of the IPS of Ukraine and the unattractive price offer, this year’s auctions resulted in almost “zero”.

The UWEA also draws attention to the ineffectiveness of another market-based support mechanism – the Feed-in Premium mechanism, enacted in 2023 by the Law of Ukraine No. 3220-IX “On Amendments to Certain Laws of Ukraine on the Restoration and Green Transformation of the Energy System of Ukraine”.

According to Elementum Energy LLC, as of the end of 2024, the company has not received a single payment for 10 months of work under this mechanism. All of these problems combined led to market stagnation (see Section 3.2 for more details).

Finally, a related and no less key challenge for the market is the difficulty of funding the projects. This could be explained not only by the military risks,

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the lack of practical mechanisms for financing wind power projects on the scale required to recover the power system, but also by the absence of effective off-take instruments, i.e. instruments that would guarantee the purchase of electricity and timely repayment of funds to the lender or stable returns to the investor (see Section 3.3 for more details).

At the same time, 2024 has become “the year of preparation for the accelerated deployment of wind energy technologies in the country”. Throughout the year, wind companies continued to develop projects, conduct the necessary wind measurements, environmental and other surveys, preparing projects for construction.

The aforementioned **Ostrovsky wind park** in the Zakarpattia region, which, when completed, will have a total capacity of 80 MW, is a vivid example. It should be noted that the Ostrovsky wind park will comprise wind turbines supplied by the Ukrainian manufacturer **Friendly Wind Technology LLC**, which production facilities were relocated from the Donetsk region to the west of the country after the start of the russia’s full-scale invasion of Ukraine. The company has not only launched a plant for the production and assembly of towers and nacelles near Uzhhorod but is preparing to launch a blade production shop. All in all, Wind Parks of Ukraine

has been developing an entire industrial park in the region. This means new jobs and the strengthening of the national machine-building industry, which is critical not only for the development of the power system but also for the economic recovery of Ukraine. In total, the company’s portfolio of future projects in the Zakarpattia region amounts to 1.5 GW.

DTEK Renewables’ projects are another striking piece of evidence. The company keeps working hard on the implementation of **Phase 2 of their Tyligulska wind farm project**. Positive news for the market was the information about the Danish government’s allocation of more than EUR 300 million to support wind projects being implemented by Danish companies in Ukraine. Already in January 2025, DTEK, the parent company of DTEK Renewables, announced that it would attract the largest private investment in Ukraine’s power sector to complete Phase 2 of the Tyligulska wind farm, namely EUR 450 million. Under the terms of the deal, banks will provide EUR 370 million of loans, backed by guarantees from the state-owned Export and Investment Fund of Denmark (EIFO) – most of which will be used to fund 64 EnVentus V162-6.0 MW turbines. DTEK is financing the remaining cost of the project. When completed, the total installed capacity of the Tyligulska wind farm will reach 500 MW. At full capacity, the wind farm will generate 1.7 TWh



of electricity per year, providing enough electricity to power 900,000 Ukrainian homes. According to the company, the installation of the Phase 2 wind turbine is scheduled for the first half of 2025, and the planned completion date – for the end of 2026.

In addition to Tyligulska wind farm, DTEK Renewables has been actively developing another of its projects, **Poltavska Wind Farm**, which is expected to become the largest one in Ukraine, with a total capacity of 650 MW. The decision to locate the wind farm in the Poltava region was made since, at the beginning of russia's armed aggression against Ukraine in 2014, the north-eastern part of the region was disconnected from the Kursk NPP in russia. As of November 2024, the company has already completed an ornithological study, as well as a geological survey and soil assessment. The company plans to start construction of the plant in 2027. The expected cost of the wind farm is USD 976 million, of which USD 638 million is planned to be raised in the form of debt financing. In total, DTEK Renewables' portfolio of future wind projects exceeds 1 GW wind capacity.

Another leading wind company in Ukraine – **Elementum Energy** does not stop in its activities either. In 2024, the company made several high-profile announcements of its upcoming projects. In September, it became known that the company was preparing to build three mini wind farms with a total capacity of 58.5 MW. **The Danube project**, which includes the Kilia, Artsyz, and Artsyz-2 wind farms with an installed capacity of 19.5 MW each, will be implemented in the Odesa region. According to the company, each wind farm is expected to generate about 66 GWh of “green” electricity annually, which saves 48,708 tonnes of carbon emissions annually and power 90,000 households. The company is also actively developing **the Lymanska wind farm** in the Odesa region.

In December, the UWEA congratulated the company on the acquisition of a 200 MW wind farm project in western Ukraine. The wind farm location is at the intersection of the Lviv, Ternopil, and Rivne regions, areas with high wind potential. The expected annual generation of this wind farm is about 700 GWh, which is equivalent to the annual electricity consumption of about 600,000 households. Elementum Energy LLC plans to bring the facility to the construction-ready stage by the end of 2025. The scope of the preparatory work includes the design, selection, and delivery of wind turbines, grid connection, implementation of ESG components, etc. In particular, the company will select wind turbines considering not only their performance but also the logistical possibilities for transportation, which have been complicated for oversized wind turbine components since the beginning of the full-scale invasion due to the inaccessibility of large seaports.

The total investment in the project is estimated at over **EUR 300 million**. Funding for the project is expected to come from local banks, international development finance institutions, export credit agencies, and the company's contribution.

Already in the winter of 2025, Eco-Optima has started construction works at its **40 MW Sokalska wind farm** site located in the north of Lviv city in western Ukraine. In December 2024, Eco-Optima and Nordex Group, both members of the UWEA, announced the inking of a contract for supplying seven wind turbines N163/5.X, including customized logistics and installation services. On 04 February 2025, Oschadbank announced the signing of multiple agreements with Eco-Optima Group to finance the construction of the WPP. The total financing provided by Oschadbank amounts to EUR 40 million, including a confirmed irrevocable “green” letter of credit worth over EUR 23 million, with participation from the EBRD as a partner bank.

The construction of the **60 MW Skolivska WPP** by Atlas Global Energy LLC keeps going on in the Stryj district, the Lviv region. The construction of the project, which consists of two stages – 20 MW and 40 MW, was started back in 2021. However, the war unleashed by russia against Ukraine has made adjustments to the project schedule. Last year, construction work resumed. The wind power plant is scheduled to be put into operation by the end of 2025. The Skolivska WPP, which comprises 9 wind turbines, will produce enough electricity to meet the needs of 80,000 households.

In 2025, construction is set to begin on a wind farm in the Volyn region with a total capacity of 147 MW. The project is owned by **JSC Concern Galnaftogaz**, which operates one of Ukraine's largest filling gas station networks, OKKO. The wind farm is expected to generate approximately 380 million kWh of electricity annually.



**Zinovi Kozytskyi**,  
owner of the Eco-Optima  
Group and Member of the  
UWEA Board



*“Building new power stations is an essential step in restoring Ukraine's energy system, which has suffered severe destruction at the hands of russia. The fact that we managed to finalize a loan agreement with Oschadbank in a record time of just 2.5 months is a testament to our commitment and efficiency. This milestone marks the beginning of a strong collaboration between Eco-Optima and Oschadbank. There is still much work ahead, but we have taken the first and most crucial step.”*



German company **NOTUS Energy** also has plans to construct three wind farms with a combined capacity of around 300 MW in the Odesa region. Construction of the first wind turbines is scheduled to commence in the third quarter of 2025, with project completion and the start of “green” electricity generation anticipated by the end of 2026.

Positive change in renewable energy legislation is another trend of 2024 (see Section 4.1 for more details). In autumn, the UWEA presented the Report “Legislative Changes Fostering Wind Energy Development in Ukraine”, developed with the financial support of the Netherlands Business Agency of the Ministry of Economic Affairs and Climate Policy of the Netherlands (RVO). This report not only analyses the key regulatory deficiencies and market barriers that hinder large-scale wind energy development in Ukraine but proposes legislative changes to address these issues. The report was presented to all key market stakeholders, including the Office of the President of Ukraine and industry ministries (see Section 4.3. for more details).

Another trend is worth noting: over the past few years, a new segment has emerged in the Ukrainian wind power market – used wind turbines. Thus, in 2024 alone, 13 used wind turbines with a total capacity of about 24 MW were installed in different regions of the country (see Section 3.5. for more details).

The year 2024 was a year of challenges and opportunities for the Ukrainian wind power industry. Despite modest growth rates, the sector demonstrates its potential for large-scale development due to the attraction of international investments, gradual improvement of the legislative framework, and active work of developers. At the same time, the market needs clear political support, resolution of debt problems, and the development of effective financing mechanisms to drive the country’s energy transformation and contribute to its economic recovery. Success will depend on the ability to integrate international best practices and mobilise resources to achieve ambitious renewable energy development goals.

## OPERATING DURING WARTIME: THE EXPERIENCE OF THE MC WIND PARKS OF UKRAINE

For MC Wind Parks of Ukraine LLC, last year was marked by adaptation to new conditions and overcoming significant challenges due to the war, particularly in terms of security and infrastructure development. The company's main generation capacities are located in active combat zones in the Mykolaiv and Donetsk regions, which greatly complicates operations. Two of the company's turbines were damaged by enemy UAV attacks in the Mykolaiv region. The most significant loss for the company was the destruction of a transformer substation at one of the wind farms in the same region at the end of 2024, leading to a temporary shutdown. As of the date of this Overview, efforts

to address these damages are ongoing, and the company is actively working to restore stable operations under these challenging conditions.

Given the need for energy decentralisation during wartime and the development of renewable energy sources, MC Wind Parks of Ukraine LLC focused its efforts in Zakarpattia. Last year, after relocating, the newly built plant for the production of multi-megawatt class wind turbines, Friendly Wind Technology LLC, resumed its activities. This plant is part of the company's portfolio and has become a crucial element in implementing the strategy of diversifying energy sources.



One of the landmark projects in Zakarpattia is the construction of the region's first wind farm with a total capacity of 80 MW, scheduled for completion in the first half of 2025. The first wind turbines are already connected to the grid and have begun generating the first gigawatt of clean energy from wind. This project marks a significant step towards the energy self-sufficiency of Zakarpattia, reflecting the company's and the state's overall strategy for decentralising energy resources across the country.

Continuing its mission, the company undertook another significant project – the construction of a new transformer substation valued at EUR 7 million. This substation has become a crucial element in ensuring the stable operation of the region's energy network and stands as a symbol of recovery and development, even during the most challenging times. This highlights the importance of investing in infrastructure that can guarantee the stability of energy supply and support economic growth, despite the severe issues faced by the country's energy system due to ongoing hostilities.

However, executing projects in the mountainous regions of Zakarpattia presents considerable challenges. The logistics of transporting large equipment through mountain passes complicates construction efforts. The company addresses these difficulties by **developing its own logistics strategies** and employing technologies that minimize environmental impact on the local nature, thereby enhancing the efficiency of installation work.

Environmental restrictions are also an important aspect of working in the highlands. Wind parks must comply with strict environmental standards to minimize the impact on the flora and fauna of the region. The company actively engages local

communities to discuss environmental issues and implements best practices for the preservation of the natural environment.

Thanks to active cooperation with local communities, the company not only contributes to infrastructure development but also invests in social initiatives, allocating 3% of its revenues to support local projects under Social Partnership Agreements. The local community, where the first 80 MW wind farm in Zakarpattia is being constructed, has already begun receiving initial budget revenues. The contributions from the generation will continue to grow with the number of installed turbines. These funds are used to build social facilities and improve living conditions in the regions where wind farms operate, contributing to the sustainable development of the local economy.

Despite the challenges, the company continues to make significant strides towards achieving its ambitious plans. In 2025, the company plans to expand its projects in the western region. At various stages of implementation, where the company acts as both developer and equipment supplier, there are wind energy projects totalling 500 MW, with the potential to expand to 1.5 GW. This will significantly increase the share of renewable energy in the national energy system and enhance the country's energy security in an unstable market. Additionally, the company anticipates the introduction of new state support mechanisms for investors, ensuring predictable income and market stability for wind energy. A crucial factor for future development will be the resumption of active lending to projects by international institutions. Furthermore, the company expects further integration of Ukraine into the European energy system ENTSO-E and the resumption of exports, which will expand sales markets, increase competitiveness, and contribute to the state's economic stability.



## FRIENDLY WIND TECHNOLOGY LLC: A JOURNEY OF RELOCATION AND BUSINESS STRATEGY ADAPTATION

The year 2024 marked a pivotal stage for Friendly Wind Technology LLC, highlighting the strategic importance of the shareholders' decision to relocate production facilities from the east of the country to Zakarpattia, ensuring the enterprise's long-term development. This move not only maintained the company's operational capability amid wartime conditions but also solidified its position as the sole national manufacturer of multi-megawatt class wind power equipment, opening new avenues for innovative growth.

The commissioning of a newly built production workshop, capable of producing up to 25 wind turbines annually, was a key milestone in enhancing the company's production capacity. The first wind turbines, each with a capacity of 4.8 MW, have already been successfully integrated into the first wind project in the Zakarpattia region, with a total capacity exceeding 80 MW, located in a region with challenging mountainous conditions. This demonstrates the company's ability to adapt its technological solutions to local needs and features.

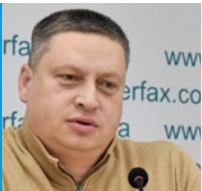
Noteworthy is the modernisation of production lines, enabling the production of the FWT-5.2 MW model with an increased section diameter of up to 6 meters, 20% larger than previous models. This technical upgrade boosts generation efficiency in the variable Carpathian wind, increasing annual



generation by 15-20%, contributing to the region's energy stability. Additionally, it reduces environmental impact by requiring fewer installations. This approach allows the company to meet modern environmental construction standards in highland areas while creating long-term regional benefits.

In 2024, the development of the FRIENDLY WINDTECHNOLOGY industrial park was a significant aspect of the company's growth. Emphasis was placed on developing its own logistics direction. Through cooperation with the state JSC Oschadbank funding was secured for the purchase of one of the world's most powerful self-propelled cranes, essential for highland project implementation. This investment not only strengthens the material and technical base but also confirms the company's credibility with state and financial institutions.

Overall, the FRIENDLY WINDTECHNOLOGY industrial park has become an exemplary integration of modern technologies, industrial development,



**Vladyslav Yeremenko,**  
General Director of Friendly  
Wind Technology LLC



*"The shareholders' decision to relocate not only ensured the continuation of the enterprise's operations during the war but also reinforced our position as the sole national manufacturer of multi-megawatt class wind power equipment. This move has opened up new opportunities for innovative development and further growth."*



and social responsibility. In 2024, the industrial park's activities generated over UAH 150 million in taxes, with more than UAH 100 million allocated to the local community's budget. These funds support infrastructure development, education, and social projects in the region, as well as job creation, currently employing over a thousand people, with plans to double this number.

The company has placed a strong emphasis on social responsibility, particularly through housing initiatives for employees of the industrial park. Construction of 13 houses for internally displaced workers has already commenced. This project is just the beginning of a series of planned initiatives aimed at improving the living conditions of workers and their families.

Despite the challenges posed by the war, including logistical difficulties and material supply issues, the company is committed to deepening the localisation of production. In 2025, an additional production line is set to launch, enabling the production of up to 40 wind turbines per year. Another significant milestone is the commencement of blade production. For the first time in the country, these crucial components of wind power plants will bear the "Made in Ukraine" label, marking a historic technological achievement for the power engineering industry.

Friendly Wind Technology LLC continues to display its ability to adapt and innovate, maintaining its position as a key player in the development of wind energy in Ukraine and contributing to the region's economic growth and social stability.



## DTEK RENEWABLES: RECORD INVESTMENT IN GREEN ENERGY AND POWER STORAGE PROJECT PORTFOLIO

DTEK Renewables is a driver of Ukrainian renewable energy development since 2008. For more than 15 years, DTEK Renewables companies constructed 1.1 GW of solar and wind power generation. As a result, the company has become the flagship of renewable energy development in Ukraine, having invested EUR 1.2 billion in this sector.

DTEK Renewables implements a full cycle of projects: from development and construction of energy facilities to management and operations. The company has a team of managers with Ukrainian and international experience and unique expertise in the construction and restoration of wind and solar farms in the context of a full-scale war.

DTEK Renewables cooperates with the best wind energy equipment manufacturers, among them are Vestas, GE, Siemens etc.

### The first wind park being built in wartime

During the full-scale Russian invasion of Ukraine, DTEK Renewables team constructed the Tylygul'ska Wind Power Plant with 114 MW of capacity composed of 19 wind turbines manufactured by Vestas, a Danish company. Tylygul'ska WPP was the first wind farm built in wartime. This is also the reason why the company was recognised as the best developer of the year in onshore wind energy at the International WindInvestment Awards 2024.



# **Fight For Light**



**DTEK Renewables**



**Oleksandr Selyshchev,**  
CEO DTEK Renewables  
and Member of the UWEA  
Board



*“DTEK Renewables team has made a lot of efforts to ensure that we were able to find the record investments in the construction of the second stage of the Tyligulska Wind Farm and launch projects in a new business direction for us – energy storage. Thanks to this, 2025 for our company is the time when we will become more active in the implementation of these projects that are extremely important for the country's energy security.”*

The project also received recognition from the American magazine **POWER** and the **POWER Awards** in the renewable energy category – Renewable Top Plant Awards.

#### **Record investment in “green” energy**

For DTEK Renewables, 2024 became a preparatory year for the future implementation of projects important for the national energy sector. The company was in active negotiations with Vestas, an equipment supplier, and financial institutions concerning building the II stage of Tyligulska WPP and started new activities related to energy storage systems.

After entering into agreement with the lenders on the allocation of financing to buy 64 wind turbines manufactured by Vestas in early 2025, the company announced its plans to increase the capacity of Tyligulska WPP four-fold from 114 MW to 500 MW.

DTEK Renewables managed to attract a total of EUR 450 million for the construction of the II stage of the wind farm being the largest international investment in Ukraine's energy sector since the full-scale Russian invasion in 2022 and the largest ever private investment in the country's energy sector.

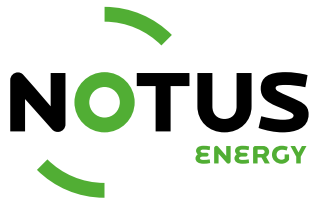
DTEK Renewables intends to start the construction of the wind farm this year, having already laid cabling and foundations, and expects to complete construction and commission the WPP by the end of 2026. At full capacity, the wind farm will produce 1.7 TWh of electricity per year – providing enough electricity to power 900,000 Ukrainian homes.

In addition to Tyligulska WPP, DTEK Renewables is planning a 650 MW wind farm in the Poltava region.

#### **Strengthening energy security and stability of the Ukrainian power grid**

Before October 2025, the company plans to complete the installation of six powerful energy storage systems in different regions of the country with a total capacity of 200 MW. The company plans to invest **EUR 140 million** into this project.

Despite the war, DTEK Group, which includes DTEK Renewables, continues investing in Ukraine. This is not only restoration of the destroyed energy capacity, but construction of new assets as part of long-term “green” power generation development strategy. DTEK's priorities remain unchanged: developing renewables, accelerating integration of the national energy system into the European one, and overall strengthening of Ukraine's energy security.



## NOTUS ENERGY IMPLEMENTS WIND FARM PROJECTS TO STRENGTHEN ENERGY RESILIENCE IN THE ODESA REGION



**Oleksandr Podprugin,**  
Country Manager of NOTUS  
Energy in Ukraine and  
Deputy Chairman of the  
UWEA Board



*“NOTUS Energy strives to remain a reliable partner for Ukraine, contributing to its recovery and sustainable development. Amid global challenges, we continue to strengthen our project portfolio, invest in innovations, and ensure high-quality management at every stage. The year 2025 will mark a confident step forward as we work not only on creating new energy capacities but also on enhancing Ukraine’s energy security and independence.”*

For NOTUS Energy, 2025 will mark a pivotal stage in achieving its strategic goals of developing and enhancing Ukraine’s energy resilience. The company, with extensive experience in designing, constructing, and managing wind and solar power plants across 19 countries, is focusing its efforts on large-scale projects in Ukraine aimed at

restoring and decentralising the country’s energy infrastructure.

Currently, the company’s primary focus is on three wind farm projects in the Odesa region with a total installed capacity of approximately 300 MW. The implementation of these projects is expected to attract over EUR 500 million in investments, enabling, among other things, a large-scale modernisation of the region’s energy infrastructure. Construction of the initial facilities is planned to begin in the third quarter of 2025, with project completion and commissioning scheduled by the end of 2026.

The implementation of these three wind farm projects by NOTUS Energy will:

- Provide electricity to approximately 300,000 households in the region heavily impacted by ongoing hostilities.
- Reduce CO<sub>2</sub> emissions through the generation of “green” energy.
- Create new jobs and attract international investments into Ukraine’s economy.



**elementum  
energy**

## STRATEGY FOR GEOGRAPHICAL DIVERSIFICATION AND EXPANSION OF THE WIND PROJECT PORTFOLIO OF ELEMENTUM ENERGY

Elementum Energy is actively developing large wind projects set to begin construction in the coming years. At the end of 2024, the company finalised the acquisition of a **200 MW wind power project** in western Ukraine, located at the intersection of Lviv, Ternopil, and Rivne regions – an area with high wind potential. The total investment in the project is estimated to exceed EUR 300 million. The wind farm is expected to generate approximately 700 GWh annually, which is equivalent to the electricity consumption of around 600,000 households. This additional capacity will significantly

support Ukraine's power grid, which faces ongoing challenges, including infrastructure damage and the need to cover peak loads.

Elementum Energy plans to reach ready-to-build status by the end of 2025. At the same time, the company is advancing wind projects in southern Ukraine, including the Lymanska and Danube wind farms, which will add over 200 MW to the grid once completed.

In early 2025, Elementum Energy signed Ukraine's first pilot price stabilisation agreement between the 100 MW Dnistrovska Wind Farm, which it operates, and an industrial enterprise. The one-year contract is based on the CfD mechanism, a variation of the corporate PPA. This mechanism enables businesses to predict electricity costs and protects them from price fluctuations – one of the key challenges in the Ukrainian energy market. For the first time in Ukraine, green energy is achieving a level of cost predictability comparable to the stability of traditional energy sources, including nuclear power.

Additionally, Elementum Energy continues to refine its electricity sales mechanisms. Previously, the company experimented with open markets and the "green" premium mechanism. In 2025, it anticipates regulatory improvements that will enhance the attractiveness of market sales. A more investment-friendly regulatory environment will expand opportunities for funding reconstruction and accelerate the development of "green" technologies in Ukraine.



**Olga Rybachuk,**  
Managing Director of  
Elementum Energy and  
Member of the UWEA Board



*"The acquisition of this large-scale project is an important step in our strategy of geographical diversification and wind portfolio expansion. Even during the war, we continue to invest in renewable energy because we believe such initiatives not only strengthen our energy capacity and security but also lay the foundation for a sustainable future. We are also introducing innovative tools to enhance efficiency in Ukraine's complex energy market. The recently launched pilot project using the CfD mechanism is the first step in this strategy, and we expect its success to drive the large-scale adoption of such mechanisms in the future. Business can be a driving force for recovery and sustainable development, even in times of uncertainty."*



# ELEMENTUM ENERGY

HARNESSING NATURE'S ELEMENTS  
TO POWER A BETTER FUTURE



# GENERAL ENERGY INSTITUTE OF THE NAS OF UKRAINE DEVELOPS A SOFTWARE AND INFORMATION COMPLEX FOR THE DOMESTIC WIND ENERGY SECTOR

## AUTHORS:

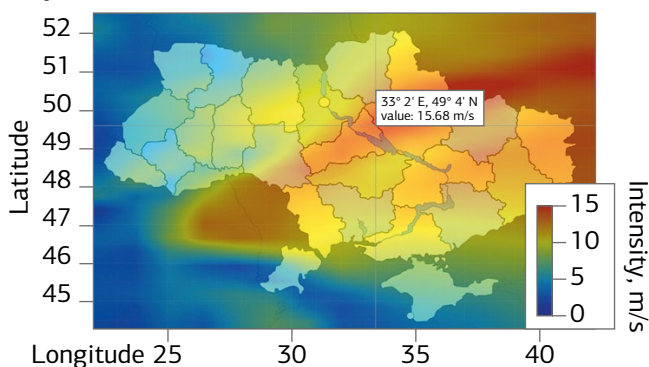
Artur Zaporozhets, Deputy Director  
Vladyslav Verpeta, PhD student

Ukraine's energy sector is currently facing the biggest challenge in the history of its independence. Although there is no exact information on the number of generation facilities that have been damaged or destroyed as a result of the Russian invasion, preliminary estimates suggest that about 60% of generation capacity has been destroyed and annexed, including TPPs – more than 90%, CHPs – more than 60%, HPPs – about 60% and NPPs – 44%. According to the Ministry of Energy of Ukraine, in 2024 alone, Ukraine lost more than 9 GW of generating capacity, and for objective reasons, it can be argued that the enemy will not give up attempts to destroy its energy infrastructure further. This has resulted in a critical deficit in Ukraine's IPS. Even after increasing electricity imports from the EU to 2.1 GW from 01 December 2024, the deficit is still significant, leading to periodic restrictions on electricity consumption for both industry and the population.

One way to overcome this problem is the development of distributed generation based on RES. In this context, wind power is one of the leading positions. According to German Galushchenko, the Minister of Energy of Ukraine has a plan to build wind generation facilities for more than 800 MW. The business sector has an even more optimistic outlook. According to Andriy Konechenkov, Chairman of the UWEA Board, investors are ready to build more than 4 GW of wind power projects in the next 4-5 years.

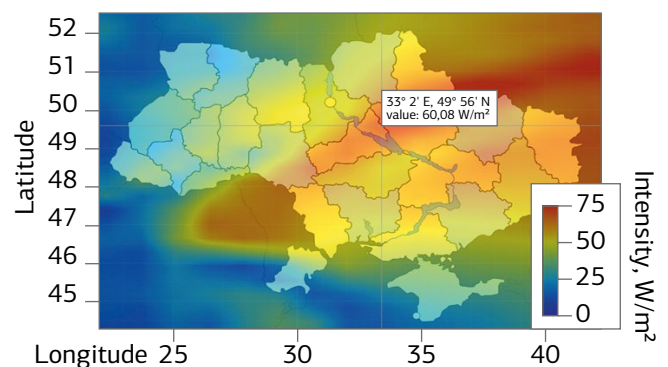
Taking into account the need to improve the country's energy security and trends in the development of distributed generation based on renewable energy sources, the GreenPowerAtlas software<sup>40</sup> and information complex (SIC) was created at the General Energy Institute of the NAS of Ukraine. This complex is designed to collect, process and analyse satellite meteorological data used to assess the generation potential of wind and solar power plants, namely wind speed, solar insolation, cloud cover, precipitation, temperature, relative humidity, absolute pressure, etc.

Figure 1. Wind Speed at 50 Meters as of 20 June 2024



Source: General Energy Institute of NAS of Ukraine

Figure 2. Surface Downward PAR Irradiance



Source: General Energy Institute of NAS of Ukraine

<sup>40</sup> <http://greenpoweratlas.com/>

Figure 3. Wind Speed Distribution

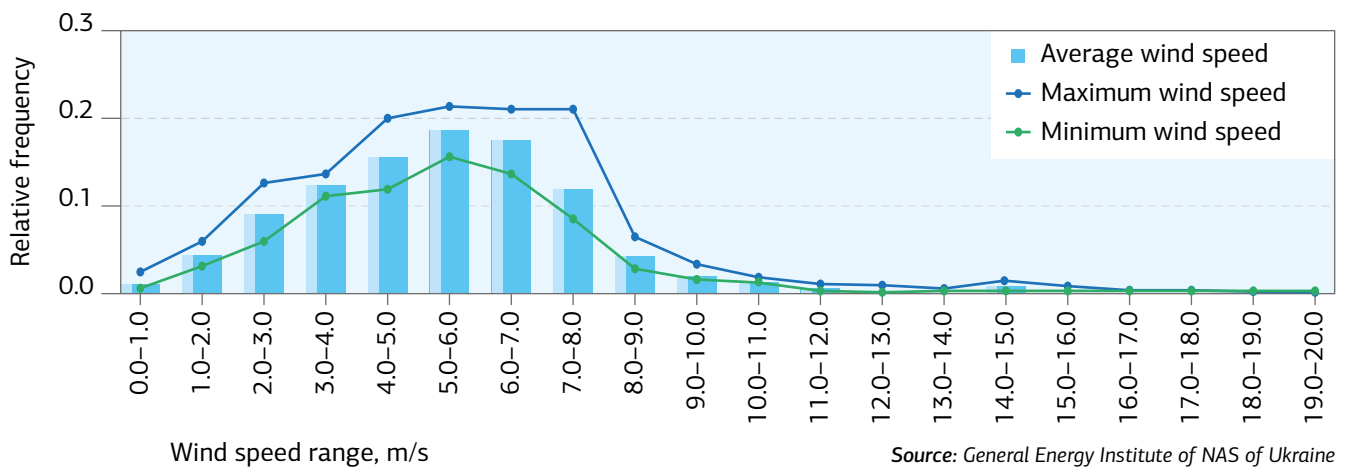
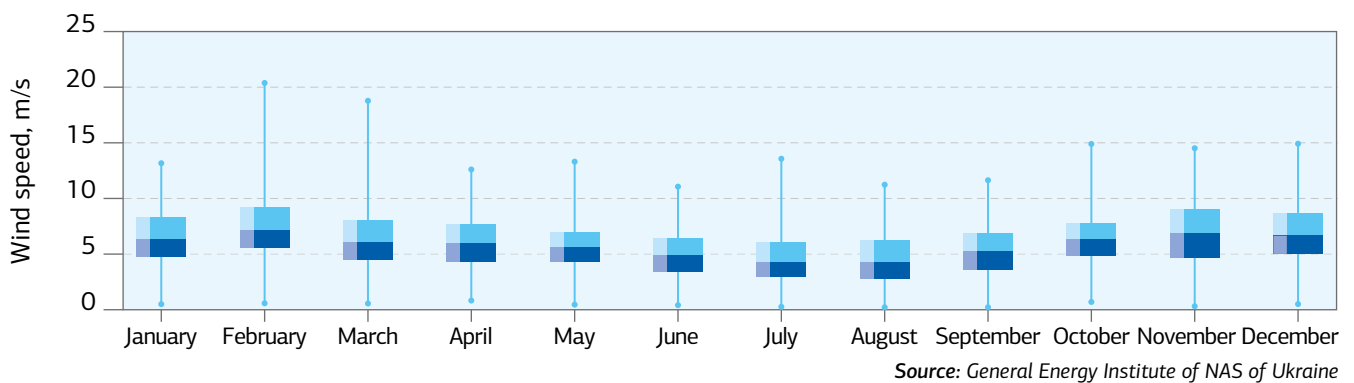


Figure 4. Wind speed range



The POWER Project (NASA), which accumulates various satellite data, serves as the primary data source for the SIC. However, the complex is adaptive and can use data from other geographic information systems. For data visualisation, GreenPowerAtlas uses LightningChart software. The SIC data is promptly updated via API.

GreenPowerAtlas offers its users a dynamic visualisation of the above meteorological data

for four days free of charge. Figures 1 and 2 show examples of visualisation of the distribution of wind speed and ambient temperature (as of 20 June 2024).

The complex uses a range of statistical data to assess the wind potential. In particular, the Figure 3 below shows a graph of wind speed frequency distribution for a given location in the Khmelnytsky region for June, which compares data for 2020-2023. The obtained graphs and data can be saved as a PNG or CSV file.

Figure 4 shows an example of implementing a scatter plot of wind speed at an altitude of 50 m in the Khmelnytsky region. This tool can be used to estimate a number of statistical parameters, including minimum, median, maximum wind speed, range, and quantiles, respectively. The developed SIC is not limited to monthly visualisation but can be adapted to use daily or weekly information.

Creating the GreenPowerAtlas SIC to assess the potential for using RES is an essential step towards further sustainable development of renewable energy in Ukraine, including wind power. This complex will not only provide the most up-to-date data and forecasts for effective planning but also increase the industry's investment attractiveness, improve the reliability of the power system, and contribute to the country's energy and environmental security.



**Artur Zaporozhets,**  
GreenPowerAtlas project manager and Deputy Director of the General Energy Institute of NAS of Ukraine



*"We have already used GreenPowerAtlas to assess the wind potential of the Novorozdilsky Industrial Park. It also helped us to select the height of the wind generator based on information about the installed capacity factor. Our team believes that such a product is important for the development of distributed generation in Ukraine. We will continue to improve the complex together with the public sector and private business. In this sense, our cooperation with the Ukrainian Wind Energy Association is very important."*

## 3.2. IMPLEMENTED AND ANNOUNCED RES SUPPORT MECHANISMS: EXPECTATIONS VS. REALITY

Subject to the provisions of the Law of Ukraine “On Amendments to Certain Laws of Ukraine Regarding the Restoration and “Green” Transformation of Ukraine’s Energy System” No. 3220-IX, adopted on 30 June 2023, new regulatory and support mechanisms have been introduced in Ukraine’s renewable energy market. As of 01 January 2024, renewable energy projects commissioned after this date are no longer eligible for the “green” tariff. Instead, modern market-based mechanisms have been implemented to promote the development of renewables. These changes align with global trends, where traditional “green” tariffs or certificates are being replaced by market-efficiency-focused instruments such as “green” auctions, market premium mechanisms, Contracts for Difference, corporate Power Purchase Agreements, and Guarantees of Origin trading. While most of these tools were launched in Ukraine in



“Our company neither uses nor plans to use the state-proposed market-based support mechanisms due to their inefficiency and unfavourable conditions for investors/producers. For instance, the proposed timeframes for implementing contracts, whether through auctions or other types of PPAs, are shorter than the standard period required for the development, design, construction, and commissioning of a wind energy project. We consider these conditions unrealistic to fulfil.”



“From 2019 to 2020, we operated under the “green” tariff mechanism. Today, this mechanism is no longer available, and we consider the other mechanisms ineffective, primarily due to the prevailing distrust of the state.”



“Currently, we sell electricity to a trader at the market price minus a discount. In our view, broader and more effective implementation of market mechanisms in Ukraine is hindered by two additional factors:

1. **The absence of war-risk insurance** – which was announced by DFC remains inaccessible. The lack of such insurance means that, for instance, if our wind turbines are destroyed in the port of Chornomorsk, not only would we lose our investment, but we would also remain indebted to the banks.
2. **Banks require a PPA contract with a blue-chip company.** However, such a guarantee is merely formal, as even a blue-chip company in Ukraine today might suspend PPA obligations due to force majeure. It would be beneficial if banks also accepted PPAs with traders who represent a much broader client base and thus provide greater financial reliability.”

2024, not all of them proved effective. According to a survey conducted by the UWEA among its member companies regarding the effectiveness of existing and announced support mechanisms in Ukraine, the primary reasons for their inefficiency include political and economic uncertainty, a lack of balance of interests between the SE NNEGC Energoatom and other market participants, imperfections in the legislative framework governing these mechanisms, and a general distrust of the state following the unsuccessful application of the “green” tariff system.

Consequently, the only viable and profitable option for selling generated electricity today for companies is independent or intermediary (via a trader) trading in various market segments, which became possible starting in 2023.

Companies that opted for the **market premium mechanism** noted that within a year, they either did not receive payments or experienced significant delays in receiving payments for the electricity generated under this mechanism.

The long-awaited pilot “green” auctions, which were held in autumn 2024 for the first time in five years, also delivered almost negligible results. For example, no participants registered for an auction offering a quota of 11 MW of solar generation, while the auction for 88 MW of new wind energy capacities attracted an insufficient number of participants (with only one participant meeting the minimum requirement – a company with Turkish investments, Atlas Global Energy LLC). Although the auction for constructing 11 MW of new micro-, mini-, and small hydropower capacities was formally deemed successful, demand from participants in this auction amounted to only 17% of the announced quota. Specifically, with a declared 11 MW quota, two participants submitted proposals totalling only 900 and 999 kW, respectively.

In addition to offering limited quotas that did not align with the current needs of Ukraine’s IPS and unattractive pricing conditions, another deterrent to participating in these auctions was a restriction that limited any one winning participant to no more than 25% of the total allocated quota. This decision proved counterproductive as it effectively restricted investors from implementing projects, especially in regions with high wind energy potential or in energy-deficient areas. The situation was further complicated by the inherent conflict of interest involving the NPC Ukrenergo, which is responsible



*“Producers who transitioned to the market premium mechanism in February 2024 received their first payments from the SE Guaranteed Buyer for services rendered in February, March, and September only in the final days of December 2024. For other months, no payments were made, even partially, as of the writing of this Overview. Moreover, power curtailments at wind power plants operating under the market premium mechanism occurred approximately six times more frequently than at wind power plants under the “green” tariff. At the same time, stations under the “green” tariff receive compensation for such curtailments. This creates unequal conditions between the two support mechanisms and renders the market premium mechanism insufficiently attractive for a mass transition. Consequently, this situation has compelled some producers to resume operations under the “green” tariff.*

*On a positive note, it is worth mentioning the expansion by Parliament of the cash method for VAT accrual for renewable energy producers operating under the market premium mechanism. This change suggests that the state may gradually remove barriers to unlocking payments under the market premium mechanism and transition to the dispatching of renewable energy capacities according to the principle stipulated by law, which prioritizes limiting renewable energy (curtailments) as a last resort.”*

for both establishing quotas and funding the transmission tariff.

The ongoing issue of accumulated debt in the electricity market, which was discussed in the previous section, also contributed to the lack of trust among international and domestic investors in “green” auctions. Although the UWEA acknowledges progress in resolving this issue, it continues to urge relevant government bodies to adopt systematic and balanced decisions to address it.

Despite the “failure” of the 2024 auctions, the government has already allocated support quotas for renewable energy for 2025: 33 MW for solar energy, 250 MW for wind energy, and 47 MW for other types of renewables. The UWEA believes that even with the increased quotas, without simultaneous improvements in market conditions,



**Andriy Konechenkov,**  
Chairman of the  
UWEA Board



*“This year, the market placed high hopes on the launch of new market-based support mechanisms, such as the market premium mechanism and “green” auctions. However, neither has functioned as expected, with the former not operating effectively and the latter failing to achieve success. In times of large-scale war, it is not the time for experimenting with businesses. On the contrary, businesses should see the state as a partner.”*

there remains a significant risk of unsuccessful auction results again this year. Additionally, to achieve the wind energy target outlined in the National Renewable Energy Action Plan for the period up to 2030 – namely, increasing the total wind energy capacity by 4 GW – at least 800 MW of new capacities must be added to the system annually. The announced quotas alone are insufficient to meet this target.

The functioning of the so-called CfD mechanism also raises questions. Under this mechanism, electricity producers are required to make payments to the SE Guaranteed Buyer if the market price of electricity exceeds the fixed price determined by auction results. At the same time, considering the significant debts of the Guaranteed Buyer to renewable energy producers, investors lack confidence in the enterprise’s ability to fulfil its payment obligations if the market price falls below the auction price. This situation not only generates distrust but also complicates the attraction of additional credit financing for projects.

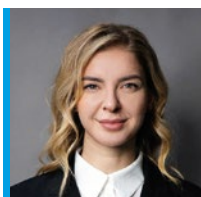
Some Ukrainian companies, however, are beginning to explore the potential of CfDs, with initial test agreements already being signed. In January 2025, Elementum Energy announced the signing of Ukraine’s first pilot CfD agreement for price stabilisation between its 100 MW Dnistrovskva Wind Farm and an industrial enterprise. Under the terms of the one-year agreement, the parties agreed on a “price corridor” – a range within which market fluctuations would not trigger additional settlements between the producer and consumer. If the market price exceeds the upper limit or falls below the lower limit, the respective party compensates the difference. Calculations are based on an indicative price index specified in the contract (e.g., the Day-Ahead Market index) and the agreed volume of electricity. At the same time, physical electricity delivery does not occur, as all operations are conducted on the open market. According to the company, this approach minimizes volatility risks for both parties and enables effective energy market cost planning.

At the same time, it is worth highlighting some positive trends. Today, one of the most successful market-driven mechanisms for incentivization is the GO trading for “green” electricity. The NEURC has been designated as the administrator of the GO registry. The NEURC has already adopted several regulatory acts required to ensure its full functionality in compliance with the specifications of Directive (EU) 2018/2001 dated 11 December 2018, on the promotion of energy use from renewable sources.

In August 2024, renewable energy producers were granted the opportunity to create accounts in the registry and register their generating facilities. The first GO trading session took place on 21 October 2024, initiated by PJSC Ukrhydroenergo. During the auction on the platform of JSC Market



*“Although the CfD mechanism could potentially become one of the most effective alternatives for the market, investor interest in the 2024 auctions was limited not only due to war-related risks but also due to uncertainties surrounding the CfD counterparties. This structure would be much more reliable if it existed as a separate entity, without debts, and accumulated profit during periods when the market price exceeded the PPA price over several years.”*



**Olga Rybachuk,**  
Managing Director of  
Elementum Energy and  
Member of the UWEA Board



*“We are implementing an innovative tool in the challenging Ukrainian energy market, where instability has become the norm. Our pilot project will help evaluate how the CfD mechanism works under real-world conditions and lay the groundwork for its application in new large-scale projects we are already developing.”*

Operator, 28,257 GOs were sold at an average price of 13 UAH/MWh. Later, in December, the SE Guaranteed Buyer initiated another auction, selling 15,000 GOs for “green” energy, with the final auction price per GO reaching 14 UAH/MWh.

However, the GO market in Ukraine will only function fully when Ukrainian renewable energy producers gain access to international GO trading markets. A significant milestone in this direction was achieved on 30 May 2024, when Ukraine was officially granted AIB membership. This opened the door for Ukraine’s GO system to operate under EU principles and rules.

At the same time, while the aforementioned market mechanisms have been implemented to some extent, the mechanism of corporate PPAs – bilateral agreements between renewable energy producers and corporate entities as buyers – remains to be launched. It should be noted that this

mechanism is currently one of the most widespread globally. According to BloombergNEF, corporations worldwide purchased a record 46 GW of clean energy through direct PPAs in 2023. Moreover, data from the RE-Source platform indicates that this mechanism also reached a record high within the EU last year, with 10.7 GW of contracted capacity recorded by the third quarter of 2024, compared to the entire year of 2023.

The ability to conclude corporate PPAs is critical for Ukrainian companies. However, despite the fact that Ukrainian Law No. 3220-IX allows renewable energy producers and corporate consumers to agree on fixed purchase prices for the entire term of a corporate PPA, ensuring price stability in the market, such agreements remain inoperable in Ukraine due to peculiarities in electricity market pricing. To address this, the UWEA developed a Concept for Introducing a Mechanism to Encourage Electricity Consumers to Enter into Corporate PPAs, outlining proposals and recommendations for incentivising such agreements.

Thus, Ukraine has made significant progress in implementing modern market-based mechanisms to promote renewable energy development, aligning with global trends and enhancing the transparency and efficiency of its energy market. However, the practical implementation of mechanisms such as “green” auctions, CfDs, and corporate PPAs has revealed serious challenges that limit their effectiveness and hinder investment attraction.

The shortcomings of the current system, including limited quotas, non-transparent quota allocation processes, unattractive pricing conditions, and accumulated debt in the electricity market, undermine investor confidence and complicate the financing of new projects. Despite these challenges, the GO market has demonstrated positive results, and Ukraine’s accession to the AIB paves the way for international GO trading.

To enhance the effectiveness of these mechanisms, the UWEA recommends that government authorities take the following actions:

#### In the area of “green” auctions:

1. **Remove the restriction limiting participants to no more than 25% of the total quota.** A positive step in this direction was taken in January 2025 with the adoption of Draft Law No. 9381, which amends various energy laws and increases the **annual quota** limit per participant or beneficiary to 50%.



*“In our negotiations with potential investors for our wind energy projects, we strive to present them with the full spectrum of market mechanisms available in Ukraine. Some assert that, in the case of financing, they will trade on the wholesale market, while others inquire more specifically about auctions. Each of these mechanisms has its advantages and drawbacks, and we firmly believe that the future project operator should make a conscious choice. However, when expressing our own opinion on the most rational and secure support mechanism, we, as a company, advocate for corporate PPAs for large-scale projects. This mechanism ensures long-term and stable revenue for projects by fixing the price of the generated electricity. Predictable revenues are critically important in high-risk markets, allowing operators and investors to manage cash flows effectively, plan future investments with confidence, and, additionally, be shielded from fluctuations in the wholesale electricity market and uncertainties about demand. However, it is crucial in this matter to focus on large, financially stable off-takers, preferably with an international presence. Is it possible to find such buyers in Ukraine? Yes. Convincing large industrial players in Ukraine to purchase “green” electricity was once a challenge, but now they are actively seeking such projects themselves. Therefore, we anticipate the first successful corporate PPAs for wind projects in the near future.”*



2. **Revoke the right of NPC Ukrenergo to determine quotas for auctions.** Instead, consider establishing an independent body responsible for calculating and setting quotas as well as coordinating auctions.
3. **Retain the existing Public Service Obligation (PSO) mechanism for producers under the feed-in tariff** while exploring PSO adaptations for new support mechanisms.
4. **Introduce a market premium mechanism for auction winners** or establish a share of excess revenue from electricity sales over auction prices.

**In the area of corporate PPAs:**

1. **Ensure uninterrupted electricity supply for consumers purchasing at least 50% of their energy from renewable sources under PPAs.** This should apply to renewable energy projects built after 01 January 2025.

Additionally, the UWEA calls for:

- **Honouring state obligations to investors;**
- **Actively seeking financial resources to improve market liquidity** and settle long-standing debts to investors;
- **Expanding collaboration with renewable energy associations** to exchange expertise and develop effective support mechanisms;
- **Engaging local communities in renewable energy projects** to promote regional socio-economic development.

Implementing these recommendations will strengthen investor confidence, improve the investment climate, and help Ukraine achieve its strategic goals in renewable energy.

## THE GUARANTEE OF ORIGIN MARKET IN UKRAINE AND PROPOSED IMPROVEMENTS BY THE STATE ENTERPRISE GUARANTEED BUYER

2024 marked a significant milestone for Ukraine with the long-awaited launch of its electricity Guarantee of Origin market. Globally, GO markets exemplify a synergistic collaboration between various electricity market participants, including renewable energy investors, electricity buyers, and traders. The growing environmental consciousness of consumers and the push for decarbonization are key drivers of this process, fueling the increasing demand and supply in recent years.

In Ukraine, the market became possible following the adoption of Resolution No. 227 by the Cabinet of Ministers on 27 February 2024, developed by the Ministry of Energy of Ukraine and the NEURC. This resolution established the procedures for issuing, trading, and redeeming Guarantees of Origin and set the methodology for determining the environmental value of electricity.

Subsequently, NEURC introduced a series of regulations governing the GO registry in Ukraine. By August 2024, with support from the USAID Energy Security Project, the regulator began accepting applications for inclusion in the electronic registry of renewable energy Guarantees of Origin.

The Ministry of Energy of Ukraine further approved the environmental value of renewable electricity, setting it at 1,232.84 kg CO<sub>2</sub> equivalent per MWh for 2024 and 1,278.55 kg CO<sub>2</sub> equivalent per MWh for 2025.

The first GO issuances and regular trading sessions in Ukraine commenced in October 2024. However, the initial months of trading demonstrated limited demand, which was almost entirely met by two major market participants – Ukrhydroenergo and Guaranteed Buyer. While other market participants also attempted to sell GOs, their volumes were

significantly smaller and did not impact overall trading results.

As of the date of this Overview, Ukraine's GO market faces low liquidity, requiring urgent attention from both government authorities and market participants. This issue is further exacerbated by the inability of Guaranteed Buyer and other GO sellers to trade on international markets. Notably, using GOs to reduce the embedded CO<sub>2</sub> emissions of exported products to the EU – a key mechanism to avoid additional taxation under the CBAM – is explicitly prohibited by CBAM Guidance.

Domestically, there is also low interest from potential Ukrainian buyers, which can be attributed to:

- Lack of demand incentives that reflect the environmental value of GOs;
- Non-recognition of Ukrainian GOs in the EU, preventing export-oriented industries from using locally issued GOs to verify the renewable origin of electricity consumed in production, which is crucial for reducing embedded emissions under CBAM.

Recognising these challenges, Guaranteed Buyer has developed a regulatory concept aimed at creating a liquid and efficient GO market in Ukraine. The proposed measures address challenges for both sellers and buyers in domestic and international markets.

Key domestic market measures include:

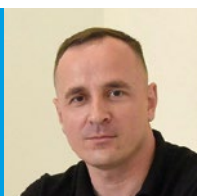
- Introducing a state program to incentivise renewable electricity production, including a tax mechanism allowing businesses to offset their CO<sub>2</sub> emissions liabilities by purchasing GOs;
- Lifting restrictions on the use of GOs in embedded emissions calculations under Ukrainian law, particularly by removing prohibitions outlined in the

CBAM Implementation Guidance, which currently prevents GO-based reductions in exported product emissions (*and thus avoiding CBAM taxation*).

To enable the trading of Ukrainian GO on the international market, the Guaranteed Buyer advocates for accelerating the process of concluding an agreement between Ukraine and the EU on mutual recognition of guarantees of origin. This agreement is essential for opening up opportunities to export Ukrainian guarantees of origin to EU countries.

The implementation of these and other measures outlined in the Guaranteed Buyer's Concept will fully launch the GO market in Ukraine, ensuring its liquidity. Moreover, leveraging GO as a tool to promote renewable energy development will help Ukraine achieve two key EU integration goals:

- reducing greenhouse gas emissions by 65% by 2030 (*compared to 1990 levels*) and reaching climate neutrality no later than 2060, as stated



**Artem Nekrasov,**  
Acting Director of  
the SE Guaranteed Buyer



*“Reaching an agreement between Ukraine and the EU on the mutual recognition of GO will open the door for exporting Ukrainian GO to EU countries. This step will provide a significant boost to the development of renewable energy in Ukraine and further integrate the Ukrainian market with the European energy market.”*

- in Ukraine's updated Nationally Determined Contribution;
- decreasing the share of thermal generation in the national energy balance by expanding renewable energy production, thereby reducing the energy sector's CO<sub>2</sub> emissions intensity.

# 3.3. ELECTRICITY PRICE GUARANTEE FUND: UWEA'S CONTRIBUTION



**AUTHOR: Oleksander Podprugin,**  
Deputy Chairman of the UWEA Board,  
Country Manager of NOTUS Energy

In 2024, the UWEA initiated active work on the creation of the Electricity Price Guarantee Fund, which aims to ensure the sustainable development of renewable energy in Ukraine. This fund will be an innovative financial instrument that will help attract the necessary investments in wind and solar energy projects, overcoming the barriers that currently hinder their implementation.

## Prerequisites for the establishment of the Fund

Due to Russian aggression, Ukraine's energy infrastructure has suffered significant losses. According to the Ministry of Energy of Ukraine, the country has lost more than 9 GW of generating capacity. To stabilize the situation and ensure energy security, more than 10 GW of new capacities, including 4 GW of wind power, need to be built by 2030. At the same time, in 2024, up to 0.03 GW of new wind farms were commissioned in Ukraine.

Renewable energy demonstrates the fastest growth rate and lowest cost of electricity production, but there are significant barriers to attracting investment in Ukraine.

To attract financing for renewable energy projects, billions of euros are needed, which are available in the support programs for Ukraine of partner international financial institutions. However, a prerequisite for providing financing is long-term sources and guarantees of return of loans, which are currently absent in Ukraine.

The development of the Fund involved a thorough analysis of existing mechanisms for supporting and financing renewable energy in Ukraine and the world. Such mechanisms are usually the following:

- The “green” tariff has been cancelled in Ukraine as of today. The last project with this support mechanism was commissioned in Ukraine in 2023, and no new effective mechanisms have been introduced. The lack of an effective transition from the feed-in tariff to market conditions, in

particular the absence of CfD that could replace the previous support model and ensure long-term financial stability for RES investors, is the reason for the suspension of new generation development.

- **Auctions** for the new generation. Particular attention was paid to the experience of the 2024 auctions, which demonstrated a low level of investor involvement due to the flaws in the auction model. Consultations with market representatives showed that investors expect the most market-based approaches to supporting the new generation.
- **Corporate PPAs.** A global trend in the development of new projects is long-term PPAs by large private consumers (*metallurgical, IT, etc.*). Such contracts replace the state's long-term obligations to buy electricity and are sufficient to provide financing from banks. However, there are almost no large consumers in Ukraine that can provide off-take for the project. Accordingly, there is currently no established practice of concluding long-term PPAs with a fixed minimum price of project financing (*over 10 years*). Currently, the maximum term of contracts is 1-2 years, which is not enough, and the volume of corporate PPAs concluded will be quite limited.

Thus, none of the global models for supporting renewable energy is currently in place in Ukraine, which is the reason for the extremely low rate of new generation.

#### Fund as a key to attracting investment

To overcome these challenges, the UWEA, together with its partners, developed the concept of the Electricity Price Guarantee Fund. The main purpose of the Fund is to insure financial risks by

covering the difference between the market price of electricity and the minimum required guaranteed price (MRGP) for loan repayment.

#### Basic principles of the fund's work:

1. **Formation of the initial capital** at the expense of contributions from IFIs and donors, without involvement of the state budget of Ukraine. The main reason for excluding the state element is the need to avoid political risks that could affect financing. Involvement of the state budget could create an additional burden on the country's finances, which are already overburdened by military spending. In addition, state participation could reduce the level of confidence of international investors, as they value the independence and transparency of a mechanism financed exclusively by market and donor funds. This approach is also in line with European standards for supporting renewable energy, which are based on attracting private capital and international institutions.
2. **Guaranteeing the MRGP:** The Fund compensates electricity producers for the difference if the average annual market price of electricity is below the MRGP (*EUR 65/MWh for wind projects*). This guarantee provides investors with predictable and stable income, which is critical for financial institutions when considering projects.
3. **Long-term support:** The fund's guarantees will be valid for the period of debt financing, for example, for 10-20 years. This will provide investors with confidence in the stability of revenues from renewable energy projects, even in the face of market price fluctuations. In addition, long-term support will help attract more favourable financing

Picture 3.3.1. Electricity Price Guarantee Fund



\*MNPC refers to the Minimum Necessary Guaranteed Price

Source: PU UWEA, 2024



from international banks, which require long-term and transparent guarantees for implementing investment programs.

- 4. Replenishment of the fund:** To ensure the viability and sustainability of the fund, its participants will pay contributions in the amount that will be fixed as a percentage of electricity sales if the DAM price exceeds the guaranteed minimum. These contributions will be the main source of replenishment of the fund and ensure its financial stability.

In addition, the fund may receive additional funds from international donors that support the development of renewable energy in Ukraine. To ensure transparency and trust of the participants, the financial audit and monitoring of the fund's activities will be conducted by international organizations, which will guarantee the targeted use of funds and compliance with the stated goals.

### Results and prospects

In 2024, the initiative to create the Fund received significant support at various levels. The Ministry of Energy and the Ministry of Economy of Ukraine have been actively involved in its implementation, recognizing the critical importance of such a mechanism for attracting investment in renewable energy. Consultations have been organized with leading international financial institutions, including

the EBRD and IFC, which have expressed their willingness to provide financial and expert support.

The concept of the Fund was presented to the Delegation of the European Commission to Ukraine, which highly appreciated the UWEA initiative and supported the development of a detailed roadmap for the establishment and operation of the Fund. This cooperation has become an important step towards the integration of the Ukrainian energy sector into the European market, as well as attracting additional resources for the development of renewable energy.

2025 should be the year when this idea is implemented and becomes the basis for large-scale financing of new wind power capacities, which are critical for Ukraine's energy security. The creation of the Commercial Risk Guarantee Fund is not only a challenge, but also a historic opportunity to consolidate the efforts of the state, international financial institutions and the private sector for the sustainable development of renewable energy. The UWEA emphasises the importance of this project as a key tool for attracting long-term investments that will contribute not only to energy independence but also to Ukraine's integration into the European renewable energy market. The UWEA calls on all stakeholders to actively participate in the implementation of the Fund, as only through joint efforts we can guarantee a stable and environmentally friendly future for Ukraine.

# 3.4. LOOKING FOR THE BALANCE: OVERVIEW OF RELEVANT LEGAL SOLUTIONS FOR COOPERATION BETWEEN DEVELOPER AND INVESTOR FOR WIND ENERGY PROJECT IN UKRAINE

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The year of 2024 could be recognized as the period of revival of transactions and acquisition in the wind energy sector of Ukraine. In the beginning of the year OKKO announced the purchase of two wind energy projects. Later in December Elementum Energy sealed the deal on another 200 MW project. In addition to that other developers actively negotiate transactions with the investors.

However, in current circumstances it could be difficult for the parties to structure negotiations and find an efficient solution to the key risks, challenges and benefits which both parties seek in the relevant transaction.

Concerning this point, we provide the overview of relevant legal solutions for cooperation between developer and investor for wind energy projects in Ukraine, such as project sale-purchase agreement, equity participation in the project, joint development agreement, and development service agreement.

## **Project sale-purchase (*acquisition*) transactions**

Within the scope of such a deal, the investor purchases all or almost all shares of the project company (SPV) from the developer in consideration of the agreed amount of money.

Negotiating such a transaction, the parties have to agree on the purchase price and condition of the project, making it eligible for the purchase (e.g. “ready-to-build” stage). Vast majority of other

matters could be managed relatively fast based on the due diligence and negotiations between the parties and their legal teams.

In peacetime this type of the transaction was the most common for the Ukrainian market, providing the parties with a reasonable level of certainty and predictability, combined with a relatively simple legal structure. Furthermore, the market price of the projects was more or less established and all parties could define clear risks and deadlines for project implementation.

Even during the war, this type of transaction remains relevant for the vast majority of the deals. However, in some cases, such a deal could either require longer negotiations or be almost impossible with the high-profile international investors who are not present in Ukraine at the moment. Those companies require much more clarity in risk assessment than could be ensured in Ukraine: grid connection, war-related, logistic, mobilisation, and other categories of risks make them reluctant to acquire projects and invest in supply of turbines and construction of the powerplant. Financing of the project also creates a huge challenge.

Therefore, negotiations include much more open questions such as conditions for purchase, variable pricing approaches, “put” and “call” options providing the parties with the exit strategies and much matters shall be covered with the transactional instruments. Taken together, these issues create ambiguity, increase legal costs and time for negotiations. Therefore a few other alternatives could be considered.

### **Joint development agreement (JDA)**

With regard to the above-mentioned aspects making acquisition transaction difficult to achieve, joint development agreement seems to be a reasonable alternative as it mitigates most of the risks and “red flags” preventing parties from cooperation.

Such kind of agreements grant the parties with the extensive flexibility. In most cases, an investing partner/sponsor entering JDA provides the financing (*in the form of the designated loans*) for the development of the project which could be further converted into the share capital. This allows us to keep the pace of the development, giving the investing partner a reasonable level of control of the development with the option to purchase the project as soon as he/she finds it reasonable.

On the other hand, JDA provides the development partner with additional financial, technical and organizational resources for the development of the project, benefits for negotiations on potential offtake (*with regard to the sponsor’s brand*) and higher level of certainty on future alienation of shares.

In addition to that, flexibility of the JDA allows the parties to keep the price question open with regard to potential military, economic and political situation in Ukraine at the time when the project could reach ready-to-build stage.

### **Equity participation in the project**

Following such an approach, the developer aims to attract equity funding from several interested non-professional investors to ensure construction of the facility, while keeping personal control over construction and operation of the project. Equity participation in the project appears to be relevant for financing of the small-scale projects in Ukraine (5-30 MW).

Such situation became possible in the framework of Ukrainian market: lacking large-scale professional renewable energy investors and project finance on the one hand, and, on the other hand, growing number of new non-professional stakeholders in the energy sector ready for equity investments to allocate cash flow from other businesses, such as retail, agriculture and construction.

Therefore, development teams, capable of demonstrating more financial, organizational and professional capacity to ensure construction of the project (*in addition to ready-to-build development*) could retain control over the project, expanding portfolio and keeping more cash-flow in the long run.

To ensure such a transaction a sale and purchase of the shares of the project, could be combined with other instruments such as corporate investment funds and project development service agreements.

### **Development service agreement (DSA)**

In this case, the developer does not pretend to receive the sale bonus in the project, being paid on the deliverable basis instead subject to the agreed milestones such as securing the land rights, grid connection and receiving the permit etc. In this light DSA could be used to involve professional developers for the development of the project, owned by a new non-professional stakeholder. In most cases, we would recommend using the DSA in communication with the above described instruments within the framework of the JDA or equity participation transactions.

## 3.5. THE MARKET FOR USED WIND TURBINES IN UKRAINE: A NEW ERA OR A TEMPORARY SOLUTION?



The re-evaluation of Ukraine’s approach to developing a decentralized energy system, as discussed in Section II, is rapidly gaining momentum. According to the **Strategy for Distributed Generation Development until 2035**, adopted on 18 July 2024: *“Given the extensive damage to existing generating capacities and the need to decentralise generation to enhance the resilience of the energy system, there is an urgent need to accelerate the construction and/or deployment of new distributed generation.”* The decentralised nature of wind energy technology, characterised by the significant spacing of wind turbines – typically over 500–600 meters apart – makes it particularly valuable for achieving the goals set out in the Strategy. This value is derived from both large-scale and small-scale wind energy projects. Large wind farms serve as the backbone of the wind energy market, as their primary objective is to generate substantial volumes of electricity for grid supply. Conversely, small-scale projects – comprising two or three wind turbines –

can be designed to supply electricity either to the grid or for self-consumption. The selection of wind turbines for any project is heavily influenced by its financial capacity. Small-scale projects can include both new and pre-owned/used WTGs, while large-scale wind farms typically rely exclusively on new installations.

The potential and attractiveness of projects with capacities ranging from 20 to 100 MW using used wind turbines are also analyzed in the Catalogue of Critical Energy Technologies for Ukraine, referenced in Section II and developed by the Danish Energy Agency for Ukraine’s Ministry of Energy. A key advantage highlighted in the Catalogue is the speed of project implementation, driven by shorter procurement and delivery times, streamlined approval processes, and reduced construction timelines. *“Under optimal conditions, including the use of pre-owned wind turbines, projects can potentially be completed within 1.5 to 2 years, underscoring the*

importance of regulatory flexibility in sustainable energy solutions,” the Catalogue notes. Additionally, the Catalogue emphasizes the cost-effectiveness of such projects: “The initial cost of a wind farm equipped with used turbines can be 30–40% lower than that of a farm using new turbines.” At the same time, it is noted that: “The LCOE of used wind turbines does not differ significantly from that of new turbines, as lower initial capital expenditures are offset by a shorter expected operational lifespan and (potentially) higher O&M costs.”

Overall, the Catalogue evaluated projects utilizing used wind turbines based on their resilience to wartime risks, winter energy production, speed of implementation, and cost-effectiveness, assigning them a score of **2.3 out of 3**. Among the advantages of such projects are significantly shorter payback periods and much lower costs for grid connection and reconstruction (if required).

The market segment for used wind turbines in Ukraine emerged in 2013 but remained underdeveloped until 2023. The first such installation – a 450 kW Bonus wind turbine – was commissioned in 2013 by ICC Ligena LLC in the Kyiv region. Subsequent projects were realized in 2018 in the Ternopil region: two E-70 turbines (Enercon) were installed to supply energy for Bioenergoproduct LLC, while two V-47 turbines (Vestas) were deployed for Zboriv Poultry Farm LLC. Notably, Zboriv Poultry Farm reinvests the profits generated from wind power into expanding the capacity of its wind farm. As of the date of this Overview, the farm now operates four wind turbines, collectively producing approximately 4 million kWh of electricity annually.

The full-scale invasion of Ukraine by Russia in February 2022, accompanied by significant losses in the national power grid, rolling blackouts, and even system-wide outages, has elevated the issues of energy sufficiency and independence for Ukrainian businesses to unprecedented levels of importance. The strategic entrenchment of the “repowering” policy in the EU’s Green Deal has fostered a more open and representative market for pre-owned equipment suppliers. Combined with the greater economic accessibility of projects utilizing used WTGs, these developments have reshaped perceptions of such projects in Ukraine.

In 2023, the Ukrainian government began actively encouraging self-consumption generation through financial tools such as the “5-7-9” credit program for micro, small, and medium businesses, and 0% loans for households to purchase solar and wind equipment along with energy storage systems. A notable success under this state support

framework was the installation of two Vestas V80 wind turbines, each with a capacity of 2 MW, in the Khmelnytskyi region in 2024. These turbines are expected to generate approximately 9 million kWh of electricity annually. According to Serhii Tiurin, the head of the regional administration: “For this project, in addition to their funds, the investors utilized the state program “Affordable Loans 5-7-9%.”

By the end of 2024, according to the UWEA, the total installed capacity of used wind turbines in Ukraine reached **32 MW**, with an average unit capacity of 1.24 MW. Over the past year alone, 13 pre-owned wind turbines with a combined capacity of approximately 24 MW were installed in the Khmelnytskyi, Cherkasy, and Ternopil regions.

Today, leading manufacturers are represented in this segment of the wind energy market, which is becoming increasingly attractive as demand for such projects grows. Market optimization over the past two years has captured the attention of various international companies specializing in pre-owned equipment. Notably, in 2024, the Dutch company Business in Wind became a member of the UWEA, marking a significant milestone in the market’s international integration.

In recent years, approaches to implementing projects involving pre-owned wind turbines have gradually shifted. Buyers and developers are increasingly focusing on the quality of used WTGs. Analysis of projects currently under preparation reveals a growing preference for refurbished turbines with a unit capacity of 2 MW or more, along with more thorough scrutiny of inspection and refurbishment reports. Today, it is essential for such equipment to come with a minimum operational warranty of 10 years. For example, as of the date of this Overview, several small-scale wind projects in the Ternopil region are underway using Repower MM82 turbines (2 MW each) and Vestas V90 turbines (3 MW each).

The profile of buyers for used wind turbines is also evolving. While such equipment was previously primarily sought by companies in the agricultural sector, it is now attracting interest from businesses in energy, IT, and finance, as well as from local communities and critical infrastructure facilities like water utilities. Additionally, in January 2025, the Ukrainian government approved regional energy passports, providing a comprehensive assessment of the distributed generation potential in each region/oblast. So, the UWEA strongly believes that wind energy – particularly the deployment of pre-owned wind turbines – will play a pivotal role in achieving the objectives outlined in these energy passports.



Projects utilizing second-hand wind turbines in Ukraine are no longer an exception but rather a growing trend shaped by modern challenges. These projects offer a **fast and economically viable investment solution** for SMEs, as well as for local critical infrastructure facilities. However, based on experience in implementing such projects in Ukraine, the UWEA highlights several key issues and challenges that should be carefully considered to avoid unforeseen costs and complications:

### 1. Turbine Quality

All second-hand wind turbines must come with:

- Inspection reports (*both pre- and post-refurbishment*).
- Recommendations for future O&M.
- A minimum remaining operational life of at least 10 years.

### 2. Logistics

In the context of martial law, logistics costs account for a significant portion of the project's CAPEX, and used turbines are no exception. Depending on the turbine's dimensions, logistics can consume a considerable share of the budget. To manage this effectively, project developers should:

- Include logistics costs in the project budget.
- Evaluate potential delivery routes and consult suppliers about various transportation options.
- Obtain multiple commercial offers from international and Ukrainian logistics providers.
- Plan for contingencies, such as adverse weather conditions that may hinder transportation.

### 3. Technical Specifications

- Determine the required capacity of the wind turbine and the voltage level for grid connection (*if connection is necessary*).
- Understand the differences between EU and Ukrainian grid standards.
  - i. EU transmission networks typically operate at 400 kV, 220 kV, and 110 kV, with distribution networks at 10 kV, 20 kV, or 35 kV.
  - ii. Ukraine uses similar levels but also retains 750 kV lines inherited from the Soviet energy system. Distribution networks commonly operate at 6 kV, 10 kV, or 35 kV, while household voltage is 230/400 volts, identical to the EU standard.
- Ensure the turbine is adapted to the technical conditions of the chosen connection setup.

### 4. Maintenance

- Plan for ongoing maintenance of the turbine.
- Note the shortage of qualified specialists in Ukraine for less common turbine models, such as Enercon or Suzlon.

### 5. Construction and Installation

- Ensure access to experienced teams capable of installing used equipment.
- The qualifications required for installation teams should match those needed for maintenance specialists.

By addressing these challenges and considerations, developers can successfully implement used wind turbine projects that provide reliable energy generation and energy independence for decades.

## 3.6. ESTIMATED OFFSHORE WIND ENERGY POTENTIAL IN UKRAINE



Since 2020, the UWEA has actively explored the development opportunities for the offshore wind energy sector in the Black and Azov Seas. This initiative was sparked by a technical potential study conducted by the World Bank, which was highlighted in UWEA's 2020 Overview. According to this study, the technical potential of offshore wind farms in Ukrainian maritime waters reaches **250 GW**<sup>41</sup>. While this figure seemed highly ambitious, it inspired the UWEA to initiate important discussions that now involve both the expert and market communities, as well as government representatives.

The first comprehensive work on this issue, developed by the UWEA in collaboration with leading experts – the law firm Asters, the Ukrainian Hydrogen Council, and the Institute of Renewable Energy of

the NAS of Ukraine – was the White Paper “Offshore Wind Energy and Green Hydrogen: Unlocking New Energy Potential for Ukraine,”<sup>42</sup> presented in March 2021. This document analyzed the potential of offshore wind energy for “green” hydrogen production based on the World Bank’s assessment and provided recommendations for the development of the necessary legislation to establish a functioning offshore wind energy market in Ukraine.

At the same time, a key practical outcome of UWEA’s work in this area at the level of the Ukrainian government is the inclusion of strategic intentions for the development of the offshore wind energy sector in the National Renewable Energy Action Plan through 2030, which was approved in August 2024.

<sup>41</sup> <https://documents1.worldbank.org/curated/en/709391586844502062/pdf/Technical-Potential-for-Offshore-Wind-in-Ukraine-Map.pdf>

<sup>42</sup> <http://uwea.com.ua/ua/news/entry/asters-uvea-i-ukrainskij-vodorodnyj-sovet-predstavlyayut-beluyu-knigu-offsh/>

However, due to Russian aggression, which has turned a significant portion of Ukraine's maritime zones into areas of military actions since 2014, the UWEA's activities in this direction are still largely focused on analytical and preparatory aspects: refining the assessment of the technical potential of wind resources in the region; adopting international best practices in the development of the necessary legal framework; and laying the groundwork for regional cooperation essential for the sector's sustainable development. For example, regarding the development of the legislative framework, consultations are currently underway between the government, represented by the Ministry of Energy of Ukraine, and the World Bank and the Danish Energy Agency.

Regarding regional cooperation, several key initiatives play a significant role, including: Ukraine's participation in the **Joint Black Sea Maritime Agenda**, an international initiative aimed at sustainable development, including the "blue economy," and the unification of Black Sea countries for deeper regional collaboration; **synchronisation with ENTSO-E**, which creates prospects for integrating Ukraine's offshore wind projects into the European grid; and the established partnership between the UWEA and the Turkish Offshore Wind Energy Association in 2021, which led to the creation of the **Black Sea Offshore Wind Energy Federation**, now uniting the relevant associations from Ukraine,

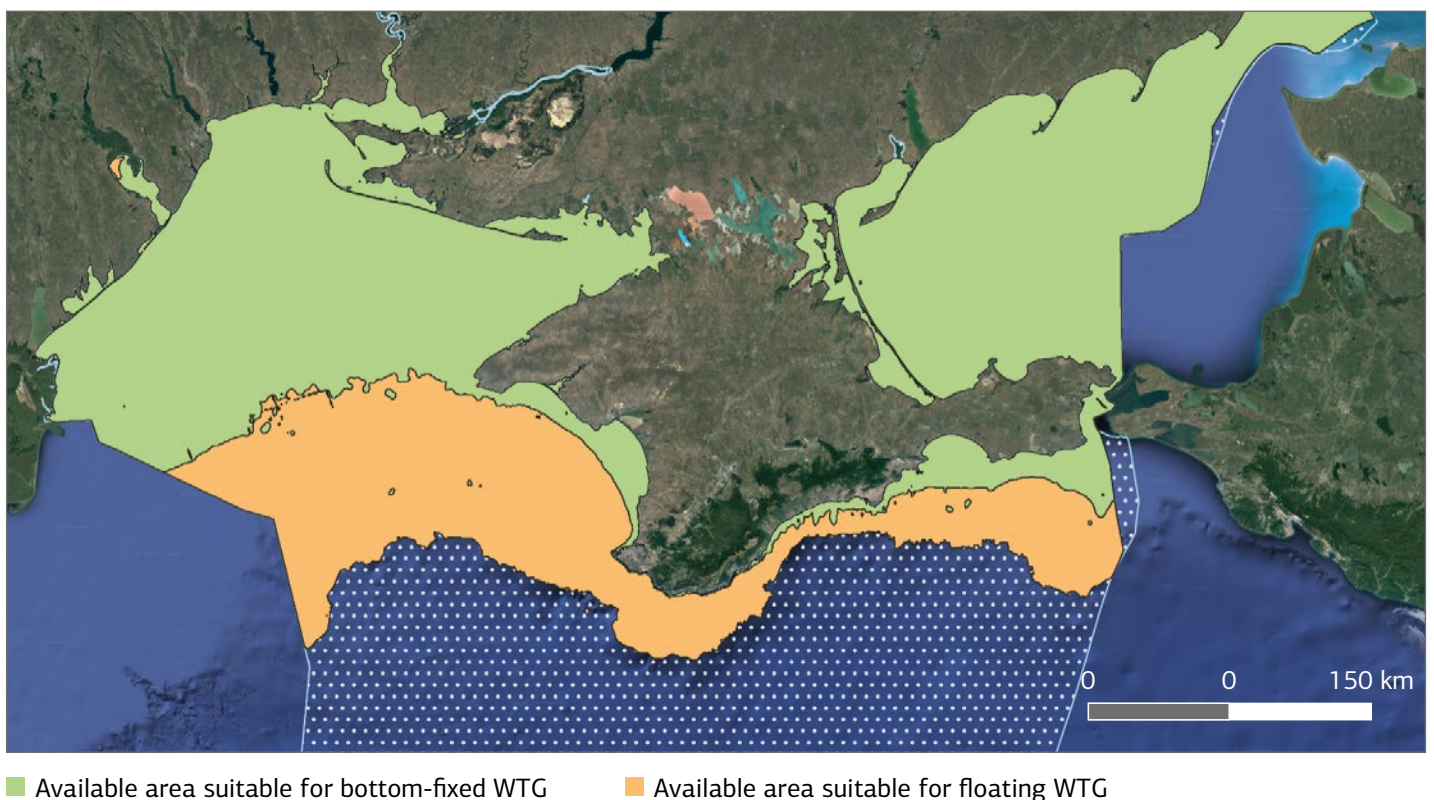
Turkey, Georgia, Bulgaria, and Romania. The Federation fosters the development of offshore wind technologies in the Black Sea basin based on mutually beneficial cooperation, considering the national legislation of the signatory associations.

In addition, in 2023, the UWEA was involved in the process of **refining the results of the World Bank's technical assessment of offshore wind energy potential**, which was carried out by the Danish Technical University (DTU) on behalf of the Ministry of Energy of Ukraine.

In its study, DTU analysed the wind resource and wind energy density in the maritime regions of Ukraine that are prospective for offshore wind development. They conducted a geospatial analysis of available territories for construction, calculated the theoretical annual electricity production, LCOE, and wake losses for such wind farms in Ukraine. Furthermore, DTU assessed the technical feasibility of grid connection in the evaluated regions and modelled the effectiveness of offshore wind farm construction in three distinct areas: the northern part of the Black Sea, the Sea of Azov, and the western part of Crimea.

According to the refined data from DTU, the total technical potential for offshore wind energy in the Black and Azov Seas of Ukraine reaches **50 GW**, with **30 GW** or 29,699 km<sup>2</sup> allocated for projects

Picture 3.6.1. Ukraine's offshore potential. Overall map of bottom-fixed and floating wind turbine areas



Source: DTU, 2023



with bottom-fixed wind turbines, and 20 GW or 19,439 km<sup>2</sup> for floating wind turbines. It should be noted that this assessment does not include areas with high shipping traffic density or marine nature reserves. Regarding the distribution of wind turbines by type and analyzing the deep-water regions of the Black and Azov Seas, DTU suggests that bottom-fixed wind turbines are most suitable for some parts of the Black and Azov Seas, where the depth reaches up to 50 meters, while floating wind turbines are most suitable for projects that can be developed along the coastline of Crimea.

Additionally, referring to data from the Global Wind Atlas, DTU concluded that at a height of 100 meters, the average wind speed in the Sea of Azov reaches 8.5 m/s, while in the north-western part of the Black Sea, it is 7.8 m/s, which presents a highly attractive wind potential in terms of net profit. However, comparing the conditions for constructing wind farms in both seas, experts summarize that the best conditions in terms of wind energy density, capacity factor, and regional competition are found in the Sea of Azov.

In conducting an economic assessment and calculating the approximate cost of electricity generated by offshore wind turbines in the Black and Azov Seas, DTU highlights the importance of the type of wind turbine used. For a project with bottom-fixed wind turbines in the Sea of Azov, the

price could potentially range from EUR 91 to 131 per MWh, while for a project with floating turbines along the coast of Crimea, it could reach 223 to 294 Euros per MWh due to the high cost of the wind energy installations themselves. At the same time, the UWEA notes that this calculation was made based on the market conditions of 2023 and has a more theoretical nature.

In terms of technical and regulatory preparation for launching the offshore wind energy market in Ukraine, DTU identifies several important aspects that complement the recommendations provided in the aforementioned White Paper, specifically:

1. Ukraine has significant potential for developing local production of wind farm components, thanks to its steel manufacturing and machine-building enterprises.
2. The ports of Odesa and Chornomorsk should be modernised for the storage and assembly of offshore wind turbines, as well as for the further construction of offshore wind farms.
3. Considering that rare species of dolphins, such as the Black Sea bottlenose dolphin, inhabit Ukrainian seas, and migration paths of birds, particularly the curly pelican, cross these areas, it is essential to avoid key biodiversity zones when selecting sites for wind farms. Additionally, it is important to standardize the procedure for strategic environmental assessments at the state level.

Even though the DTU study and the interest of international investors are encouraging action, the first offshore wind energy projects in Ukraine will only be possible after the martial law is lifted and the corresponding marine territories are de-occupied. Although the country's geographic location and the natural conditions of the Black and Azov Seas indeed create favorable conditions for investment in this sector, including attractive wind resources, large areas with shallow depths, availability of electrical and port infrastructure, and a competition-free market, Ukraine faces significant challenges such as: demining the waters, developing transparent legislation and risk insurance mechanisms, integrating environmental standards, and restoring and protecting marine biodiversity. However, war time is also a time for preparation for restoration, for developing strategies and plans, and for presenting Ukraine as a potentially interesting platform for the development of offshore wind projects once peace is achieved.

In particular, the UWEA continues to raise the issue of Ukraine's offshore wind potential on all possible

international platforms. For example, in November 2024, during a working visit to the Kingdom of the Netherlands<sup>43</sup> the UWEA representatives became speakers at the session "Onshore and Offshore Wind Energy Solutions for Ukraine's Economic Resilience," which was part of the two-day Offshore Energy Exhibition & Conference agenda.

As a result of the session, the UWEA and NedZero signed a Memorandum of Partnership and Cooperation, which includes provisions on cooperation regarding the exchange of offshore wind energy experience.

The Black and Azov Seas open up boundless opportunities for Ukraine. This is not only a potential for energy production but also a symbol of the country's recovery after the war. By developing offshore wind energy, Ukraine will not only ensure its energy independence but also make a significant contribution to global climate goals. Sea winds will bring a new future to life, in which resilience, innovation, and collaboration will form the foundation of national development and economic progress.

<sup>43</sup> <http://uwea.com.ua/ua/news/entry/uvea-zmchny-spvpracyu-z-gollandskim-vtroenergetichnim-bznesom/>

# IV

## REGULATORY FRAMEWORK FOR WIND POWER IN UKRAINE



# 4.1. KEY LEGISLATIVE CHANGES IN 2024

Some important legislative and regulatory changes took place for the Ukrainian electricity market in 2024. All of them were aimed, for the most part, at adapting national legislation to EU requirements and ensuring the functioning of the market under martial law.

Thus, during the year, the NEURC approved **secondary legislation on REMIT**, in particular:

- requirements for integrity and transparency in the wholesale energy market;
- the Procedure for submitting information on transactions with wholesale energy products;
- an illustrative list of inside information and criteria for its definition;
- updated procedures for investigating abuses and imposing fines for violations in the wholesale market.

To support market participants, the Regulator also created a new Integrity and Transparency/REMIT section on its website, where it posted explanations, application forms and other useful information on this issue.

In addition, 2024 was marked by the launch of important **mechanisms to support renewable energy**: guarantees of origin of electricity, the market premium mechanism and “green” auctions. **In order to solve the chronic problem of debt in the electricity market**, which remains one of the main obstacles to attracting investors, the Government cancelled the order of the Ministry of Energy of Ukraine dated 15 June 2022 No. 206, which limited settlements in the market, but the final resolution of this issue requires further action from the State.

In 2024, the **reorganization of SE Guaranteed Buyer into a public joint-stock company** began. That change will contribute to the transparency of the state-owned enterprise and increase the trust of foreign investors.

The past year was also marked by the **adoption of national plans** that consolidated the country’s “green” course.

In general, the Ukrainian energy sector is actively adapting to European standards while overcoming the challenges of the war. Therefore, below we provide a detailed overview of the main regulatory and legislative changes for 2024.

## Implementation of the Law of Ukraine “On Amendments to Certain Laws of Ukraine on Preventing Abuse in Wholesale Energy Markets” No. 3141-IX dated 10 June 2023 (REMIT Law)

The long-awaited REMIT Law was adopted back in 2023, but last year a number of instruments were approved regarding its practical implementation in Ukraine and a number of measures were taken to demonstrate the application of this business mechanism.

### KEY INSTRUMENTS ADOPTED IN 2024:

#### Requirements for ensuring integrity and transparency in the wholesale energy markets, approved by the NEURC’s Resolution No. 614 dated 27 March 2024 (Requirements)<sup>44</sup>

The approved Requirements specify the conditions for handling and disclosing inside information, establish requirements for persons who carry out transactions with wholesale energy products (*gas, electricity*) and identify red flags that may point to market abusive behaviour in the energy market. In particular, the Regulator identifies four types of behaviour that may constitute manipulation in the energy market:

1. Creating misleading signals about demand or supply;
2. Artificially setting prices for wholesale energy products;
3. Using deception or abuse of trust;
4. Disseminating false information through the media.

The defining criterion for manipulative behaviour is its effect on demand, supply or prices. To prevent manipulation in energy markets, participants are required to disclose **inside information** – data that directly or indirectly pertain to one or more energy products and could affect their market value if made public.

<sup>44</sup> <https://zakon.rada.gov.ua/rada/show/v0614874-24#Text>

Inside information is published in accordance with the **Procedure for the functioning of inside information platforms, approved by the NEURC's Resolution No. 137 dated 16 January 2024**<sup>45</sup>. This Procedure establishes requirements for the functioning of inside information platforms and for administrators of inside information platforms, and also regulates the Procedure for interaction between wholesale energy market participants and administrators of such platforms.

On 04 December 2024, the NEURC adopted **Resolution No. 2030** on Amendments to the Requirements and approved the **Model List of Inside Information for the Electricity and Natural Gas Markets**<sup>46</sup>.

The Model list contains a list of events that can serve as a reference for market participants in determining whether a certain event constitutes inside information. It is of an advisory nature, meaning it serves as a kind of roadmap for assessing the impact of events on the market price.

The participant can assess whether there is an impact on the price using certain criteria, such as the magnitude of the event that has occurred or is planned to occur, demand/supply information that has already been disclosed, the time of day, or other relevant factors.

On 21 August 2024, the NEURC adopted **Resolution No. 1493**<sup>47</sup>, according to which, for the duration of martial law in Ukraine and 30 days after its termination or cancellation, the disclosure of inside information on platforms is carried out in a trial mode, during which penalties are not imposed.

**The Procedure for submitting information on completed transactions involving wholesale energy products, as approved by the NEURC's Resolution No. 618 dated 27 March 2024 (the "Procedure")**<sup>48</sup>.

The Procedure provides that wholesale market participants in the energy sector – persons professionally arranging or executing transactions with wholesale energy products – are required to submit information on commercial transactions involving wholesale energy products (*electricity/gas*) to the NEURC.

Participants are required to provide detailed information on:

**Standard contracts:**

- contracts executed to sell products through organised trading facilities, exchanges, electronic auctions, and trading platforms of the Market Operator and the Ukrainian Energy Exchange;
- contracts executed outside the transaction systems for wholesale energy products, with characteristics similar to those of the wholesale energy product.

**Non-standard contracts:**

- contracts that do not comply with the standard conditions offered at the trading facilities of the Market Operator and the Ukrainian Energy Exchange.

The deadline for participants to begin submitting information was 29 December 2024 (*within 180 days after the entry into force of the Resolution*). By 29 December 2024, participants were required to submit information on:

- transactions executed before 2 July 2023, but not completed by this date;
- transactions executed from 2 July 2023, until the entry into force of the Resolution.

On 10 December 2024, the NEURC adopted **Resolution No. 2102**<sup>49</sup>, which provides that market participants should notify of the need to make changes to reports of transactions with wholesale energy products submitted during 2023-2024. With these changes, the NEURC also approved:

- a list of wholesale energy products for which information on completed transactions is reported;
- a list of information on completed transactions involving wholesale energy products, provided upon request by the NEURC;
- characteristics that determine whether a wholesale energy product qualifies as a standard contract.

**Amendments to the Procedure for the Registration of Wholesale Energy Market Participants, as approved by the NEURC's Resolution No. 1812 dated 4 October 2023**<sup>50</sup>, (*the "Registration Procedure"*), including:

**Amendments made by Resolution No. 1709 dated 09 October 2024**<sup>51</sup>, which expanded the

<sup>45</sup> <https://zakon.rada.gov.ua/rada/show/v0137874-24#Text>

<sup>46</sup> <https://zakon.rada.gov.ua/rada/show/v2030874-24#n3>

<sup>47</sup> <https://zakon.rada.gov.ua/rada/show/v1493874-24#Text>

<sup>48</sup> <https://zakon.rada.gov.ua/rada/show/v0618874-24#Text>

<sup>49</sup> <https://zakon.rada.gov.ua/rada/show/v2102874-24#Text>

<sup>50</sup> <https://zakon.rada.gov.ua/rada/show/v1812874-23#Text>

<sup>51</sup> <https://zakon.rada.gov.ua/rada/show/v1709874-24#n2>

scope of application of the Registration Procedure to persons engaged in transactions with wholesale energy products without forming a legal entity in accordance with a joint activity agreement or a simple partnership contract.

**Amendments made by Resolution No. 2115 dated 18 December 2024<sup>52</sup>**, allow non-residents to register as participants in the wholesale energy market, provided that they have a code issued by ACER or the regulatory authority of the Energy Community. In addition, such non-residents should plan or already carry out exclusively the following operations:

- acquisition of the right to use cross-border capacity;
- ordering natural gas transmission services on cross-border connections.

#### Enhancing the procedure for investigating abuses in the wholesale energy markets

On 24 September 2024, the NEURC adopted **Resolution No. 1646<sup>53</sup>**, which amended the Procedure for investigating abuses in the wholesale energy market (*the Procedure*). The changes relate to:

- clarification of the timeframes for conducting investigations: 12 months for identified entities and 18 months for unidentified entities; if there are valid grounds, these timeframes may be extended for another 6 months;
- conditions for conducting preliminary inquiries;
- the process of interaction between the NEURC, the Energy Community Regulatory Board and the Energy Community Secretariat regarding reporting certain types of abuse;
- rules for sending notifications about the initiation and results of investigations.

The Procedure has also been supplemented with annexes containing the form for the investigation conclusion and the log for registering conclusions on the results of investigations.

#### Establishing the amount of fines for violations in the wholesale energy market

By **Resolution No. 1234 dated 28 June 2024<sup>54</sup>**, the NEURC amended the Procedure (*methodology*) for calculating the amount of fines imposed by it (*the Procedure for Determining Fines*). According to the amended Procedure for Determining Fines, the fine may be reduced by up to 100% in the event of a violation for reasons beyond the licensee's control,

due to the fault of a third part, particularly as a result of the failure of other parties to fulfil their obligations to the licensee.

In such a case, the licensee is required to prove these circumstances by providing supporting documents.

By **Resolution No. 1754 dated 15 October 2024<sup>55</sup>**, the NEURC amended the Procedure for Determining Fines regarding mitigating circumstances of the committed violation, particularly regarding the list of such circumstances and the percentage that affects the reduction of the fine:

- compensation for damages incurred before the abuse is detected – 30%;
- actions taken to eliminate the abuse before its detection – 20%;
- recognition and termination of the abuse after its detection – 15%;
- reporting the abuse on one's own initiative before the investigation begins – 20%;
- providing assistance during the investigation – 15%; and
- absence of harm to the market or consumers – 15%.

If the calculated fine is less than the minimum fine, the NEURC may apply other penalties instead – a warning or a warning with an obligation to eliminate the violations.

## MECHANISMS TO SUPPORT RENEWABLE ENERGY

The year 2024 was marked by the introduction of several mechanisms to support renewable energy, including the market premium mechanism, guarantees of origin for electricity, and the first “green” auctions (*for more details, see section 3.2.*).

#### Market premium mechanism

On 24 January 2024, the NEURC adopted **Resolution No. 178 “On Amendments to Certain Resolutions of the National Commission for the Regulation of Energy and Utilities of Ukraine”<sup>56</sup>** (*the Resolution*) to bring regulatory legal acts into line with the Law of Ukraine “On Amendments to Certain Laws of Ukraine on the Restoration and “Green” Transformation of the Energy System of Ukraine” No. 3220-IX dated 30 June 2023 (*the Law of Ukraine “On Green Transformation”*).

<sup>52</sup> <https://zakon.rada.gov.ua/rada/show/v2115874-24#n2>

<sup>53</sup> <https://zakon.rada.gov.ua/rada/show/v1646874-24#n3>

<sup>54</sup> <https://zakon.rada.gov.ua/rada/show/v1234874-24#Text>

<sup>55</sup> <https://zakon.rada.gov.ua/rada/show/v1754874-24#Text>

<sup>56</sup> <https://zakon.rada.gov.ua/rada/show/v0178874-24#Text>

The changes addressed the procedure for suspending agreements for the sale and purchase of electricity at FiT prices, the withdrawal of RES producers from the balancing group of SE Guaranteed Buyer, and the sale of electricity on the market at market prices based on an agreement for the provision of services to support the production of electricity from RES under the market premium mechanism.

The specified changes resulted in the restatement of:

- The Procedure for purchasing electricity generated from RES by SE Guaranteed Buyer in order to determine the cost of the service to support the increase in the share of electricity generation from RES and to determine the cost of the service under the market premium mechanism;
- a standard agreement for the purchase and sale of electricity at FiT prices;
- a standard agreement for the provision of services to support the increase in the share of electricity generation from RES.

These changes also approved:

- a standard agreement for participation in the balancing group of SE Guaranteed Buyer;
- a standard agreement for the provision of services to support the production of electricity from RES under the market premium mechanism.

#### Guarantees of origin of electricity from RES

On 27 February 2024, the Cabinet of Ministers of Ukraine adopted Resolution No. 227 “On the Introduction of the Guarantees of Origin of Electricity Produced from Renewable Energy Sources” which approved the “Procedure for Issuing, Circulating, and Redeeming Guarantees of Origin of Electricity Produced from Renewable Energy Sources” and the “Procedure for Determining the Environmental Value of Electricity Produced from Renewable Energy Sources”<sup>57</sup>.

Guarantees of origin confirm the right of their holder to the environmental value, including the volume of avoided CO<sub>2</sub> emissions and the positive impact of electricity generating from renewable sources.

#### The approved Procedure regulates:

1. The functioning of the guarantees of origin register;
2. The procedure and requirements for registration in the guarantees of origin register;
3. The procedure for issuing, circulating, and redeeming guarantees of origin; and

4. The procedure for conducting inspections of generating installations and consumers.

A guarantee of origin is issued for the volume of electricity supplied to the grid, which is 1 MWh, during the operational period (*the calendar month during which the electricity was produced*).

The guarantee of origin is in free circulation for 12 months from the date of electricity production, and the guarantee should be redeemed within 18 months from that date. If the guarantee has not been redeemed within 18 months, it is cancelled.

The issuance, circulation, and redemption of guarantees of origin are carried out exclusively between users of the register. Guarantees of origin are issued, transferred, or redeemed by submitting electronic requests in the register.

In August 2024, the electricity guarantees of origin register became operational, and in October, the NEURC issued the first guarantees of origin to PJSC Ukrhydroenergo for a total volume of about 96.5 GWh.

According to the approved “Procedure for Determining the Environmental Value of Electricity Produced from Renewable Energy Sources”, the environmental value is defined as the amount of CO<sub>2</sub> emissions that have been avoided.

The environmental value is measured in kilograms of CO<sub>2</sub> equivalent per 1 MWh of electricity and represents the average amount of greenhouse gases that would be emitted by electricity producers using thermal power plants in the process of generating electricity from fossil fuels, if electricity produced from RES were to replace it.

On 14 August 2024, the NEURC adopted Resolution No. 1475<sup>58</sup>, which approves the application forms for creating an account, terminating, and resuming the use of an account in the register of guarantees of origin of electricity produced from RES, as well as instructions for filling them out (*Resolution No. 1475*). Resolution No. 1475 approved the following:

1. Application form for creating an account in the register of guarantees of origin of electricity produced from RES;
2. Application forms for terminating and resuming the use of an account in the register of guarantees of origin of electricity produced from RES;
3. Instructions for filling out the application forms for creating an account, terminating, and

<sup>57</sup> <https://zakon.rada.gov.ua/laws/show/227-2024-%D0%BF#Text>

<sup>58</sup> <https://www.nerc.gov.ua/acts/pro-zatverdzhennya-form-zayav-pro-stvorennya-oblikovogo-zapisu-v-reyestri-garantij-pohodzhennya-elektrichnoyi-energiyi-virobnoyi-z-vidnovlyuvanih-dzherel-energiyi-ta-pro-pripinennya-i-vidno>

resuming the use of an account in the register of guarantees of origin of electricity produced from RES.

According to Resolution No. 1475, by 1 October 2024, business entities that sell electricity to a guaranteed buyer at FiT prices or provide services to a guaranteed buyer using the market premium mechanism were required to obtain the status of a user of the register of guarantees of origin of electricity generated from RES.

#### Launch of “green” auctions

According to the Order of the Cabinet of Ministers of Ukraine No. 757-p dated 13 August 2024, “On Certain Issues of Conducting Pilot Auctions for the Allocation of Support Quotas in 2024,” annual support quotas for producers of “green” electricity for 2024 and a schedule for conducting pilot “green” auctions were established<sup>59</sup>. The winner of the auction receives a guarantee for the repurchase of all electricity generated at the facility that won the auction for 12 years.

In 2024, SE Guaranteed Buyer conducted three pilot auctions: for solar energy (11 MW), for wind energy (88 MW), and for other types of renewable energy sources (11 MW). On 29 November 2024, the Cabinet of Ministers of Ukraine adopted Resolution No. 1195-p “On Certain Issues of Holding Auctions for the Allocation of Renewable Energy Support Quotas for 2025 and Establishing Indicative Forecast Indicators of Annual Support Quotas for 2026-2029”, which established the quota for 2025<sup>60</sup>, specifically for solar energy (33 MW), wind energy (250 MW), and other types of renewable energy sources (47 MW).

#### Connection to the grid of installations for electricity generation from solar or wind energy

According to the NEURC Resolution No. 875 dated 8 May 2024<sup>61</sup>, “On Amendments to Resolution No. 352 “On the Features of Temporary Connection of Electrical Installations to the Distribution System during the Period of Martial Law in Ukraine”, business entities planning to connect installations for the production of electricity from solar or wind energy to the grid by 1 January 2026, should install an energy storage system with a capacity equal to or greater than the capacity of their generating installation.

If the capacity of electrical installations exceeds 5 MW, the technical conditions should be approved by the DSO in coordination with the TSO.

## PRICES, TARIFFS AND CALCULATIONS IN THE ELECTRICITY MARKET

In 2024, several changes were adopted regarding pricing, tariffs, and measures that impacted the settlement procedures in the electricity market between participants. We will focus on the following key changes:

#### Revocation of the Order of the Ministry of Energy “On Payment Restrictions under the FiT during the State of Martial Law in Ukraine”

On 1 May 2024, the Order of the Ministry of Energy of Ukraine “On the Annulment of the Order of the Ministry of Energy of Ukraine” No. 206 dated 15 June 2022, (order No. 206)<sup>62</sup> came into force.

Order No. 206 established an advance payment rate for electricity purchased from alternative sources at 18%. Full payment was to be made proportionally, subject to the availability of funds in the account of SE Guaranteed Buyer.

Order No. 206 was issued by the Ministry of Energy of Ukraine as a measure aimed at supporting the industry and ensuring that settlements with producers were made in an amount no less than the established minimum.

However, SE Guaranteed Buyer interpreted this order as releasing it from the obligation to make full payments to producers at FiT prices.

As a result, debts of SE Guaranteed Buyer to producers accumulated, leading to a number of court disputes over the collection of funds from the enterprise, including a 3% annual fee and inflation costs accrued on the outstanding debt.

On 11 April 2024, the Commercial Court of Cassation issued a decision in case No. 910/9100/22, concluding that Order No. 206 regulates the distribution of funds specifically for advance payments and does not exempt SE Guaranteed Buyer from the obligation to make final settlements with sellers by ensuring 100% payment for the electricity supplied.

<sup>59</sup> <https://zakon.rada.gov.ua/laws/show/757-2024-%D1%80#Text>

<sup>60</sup> <https://zakon.rada.gov.ua/laws/show/1195-2024-%D1%80#Text>

<sup>61</sup> <https://zakon.rada.gov.ua/rada/show/v0875874-24#Text>

<sup>62</sup> <https://zakon.rada.gov.ua/laws/show/z0545-24#Text>



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Three weeks after the adoption of this decision, the order of the Ministry of Energy of Ukraine on the revocation of Order No. 206 came into force.

#### New price caps on the DAM, IDM, and balancing market

The NEURC by its Resolution No. 1976 dated 25 November 2024, “On Price Caps for the Day-Ahead Market, Intraday Market, and Balancing Market”<sup>63</sup>, revised the price caps and approved them at the levels specified in Table 4.1.

#### Increase in the electricity transmission service tariff

On 19 December 2024, the NEURC adopted Resolution No. 2200, which set the tariff for electricity transmission services at 686.23 UAH/MWh, 30% higher than the previous year's rate<sup>64</sup>.

According to the statement by NPC Ukrenergo for the first time in four years, the new tariff has accounted for almost the entire scope of the company's public service obligations, helping to prevent further debt accumulation in the electricity market.

#### The deadline for NPC Ukrenergo to fully settle payments for electricity purchased in 2023 has been extended

On 4 December 2024, the NEURC amended its Resolution No. 168-p dated 19 June 2024 “On the Elimination of Violations by NPC 'Ukrenergo’”<sup>65</sup>.

The amendments extend the deadline for NPC Ukrenergo to fully settle payments from 1 December 2024 to 1 July 2025:

- for electricity purchased in 2023 to settle imbalances under an imbalance settlement agreement;
- for balancing electricity purchased in 2023 from balancing service providers;
- for the service actually provided in 2023 by SE Guaranteed Buyer to support the increase in the share of electricity generated from renewable sources, as provided by universal service suppliers in accordance with concluded agreements and applicable legislation.

#### CHANGES IN THE LEGAL FRAMEWORK AND OPERATIONAL STRUCTURE OF SE GUARANTEED BUYER

During 2024, regulatory changes affected RES producers cooperating with SE “Guaranteed Buyer.” In particular, amendments to Resolution No. 641 were introduced to align agreements with new support mechanisms for the “green” sector. These changes also impacted the amount of fines, the procedure for dispute resolution in case of disagreements with official acts, and the process for offsetting counterclaims.

#### Reorganization of SE Guaranteed Buyer

On 23 April 2024, the Cabinet of Ministers of Ukraine adopted Resolution No. 367-p “On

**Table 4.1.** Price caps in various market segments

Time interval	Maximum price	Minimum price
<b>DAY-AHEAD AND INTRADAY MARKETS</b>		
00:00 to 07:00	5 600,00 UAH/MWh (129 EUR/MWh)	10,00 UAH/MWh (0,23 EUR/MWh)
11:00 to 17:00		
07:00 to 11:00	6 900,00 UAH/MWh (159 EUR/MWh)	
23:00 to 24:00		
17:00 to 23:00	9 000,00 UAH/MWh (207 EUR/MWh)	
<b>BALANCING MARKET</b>		
00:00 to 07:00	6 600,00 UAH/MWh (152 EUR/MWh)	0,01 UAH/MWh (0,0023 EUR/MWh)
07:00 to 17:00	8 250,00 UAH/MWh (190 EUR/MWh)	
23:00 to 24:00		
17:00 to 23:00	10 000,00 UAH/MWh (230 EUR/MWh)	

<sup>63</sup> <https://zakon.rada.gov.ua/rada/show/v1976874-24#Text>

<sup>64</sup> <https://www.nerc.gov.ua/sferi-diyalnosti/elektroenergiya/promislovist>

<sup>65</sup> <https://www.nerc.gov.ua/acts/pro-vnesennya-zmin-do-rozporyadzhennya-nacionalnoyi-komisiji-shcho-zdijsnyuye-derzhavne-regulyuvannya-u-sferah-energetiki-ta-komunalnih-poslug-vid-19-cherwnya-2024-roku-168-r-2>

**Certain Issues Regarding the Transformation of SE Guaranteed Buyer into a Joint-Stock Company, 100 Percent of Shares of Which Are Owned by the State**<sup>66</sup>. Subsequently, a corporatization plan was published, outlining that the transformation process is expected to be completed by July 2025.

This decision follows one of the key conditions for Ukraine's accession to the EU. As a result of the transformation, corporate governance transparency in the state-owned company will be enhanced, potentially increasing foreign investor confidence in Ukraine.

#### **Amendments to standard agreements to which SE Guaranteed Buyer is a party**

During 2024, several amendments were made to the standard agreements to which SE Guaranteed Buyer is a party. In addition to the changes related to the market premium mechanism adopted in January, the NEURC updated these agreements two more times, requiring RES producers to renegotiate them within specified deadlines.

In particular, on 26 July 2024, NEURC adopted **Resolution No. 1381**<sup>67</sup>, introducing amendments to the standard agreements regarding fines and guarantees of origin for electricity. The changes concerned:

- Agreement for the purchase and sale of electricity at FiT prices;
- Agreement for the provision of support services for electricity generation from renewable sources under the market premium mechanism;
- Agreement for participation in the balancing group of SE Guaranteed Buyer;
- Procedure for the purchase of electricity generated from alternative sources by SE Guaranteed Buyer.

As a result of these changes, the fine that may be applied to SE Guaranteed Buyer and RES producers has been reduced from 7% to 1% of the unpaid amount.

In the section concerning guarantees of origin for electricity, RES producers are now required to obtain guarantees of origin in the registry on a monthly basis and transfer them to SE Guaranteed Buyer. In case of breach of this obligation, SE Guaranteed Buyer will initiate the exclusion of the producer's generating facilities from the balancing group, and the validity of its agreements will be suspended until the producer fulfils these requirements.

RES producers were required to renegotiate agreements with SE Guaranteed Buyer by 1 October 2024.

**On 4 December 2024, the NEURC adopted Resolution No. 2060**<sup>68</sup>, amending the regulations governing the activities of SE Guaranteed Buyer, the purchase of electricity at FiT prices, and the acquisition of services under the market premium mechanism in the part related to:

- amendments to the Market Rules to clarify the requirements for RES producers receiving support to enter into an agreement with the TSO for load reduction services regarding RES participation in the balancing market;
- clarification of the conditions for providing services under the market premium mechanism;
- clarification of the procedure for calculating the share of costs related to setting imbalances within the balancing group of SE Guaranteed Buyer and corresponding amendments to the relevant standard agreement;
- amendments to the procedure for resolving disputes between RES producers and SE Guaranteed Buyer in the event of disagreement in the reported data;
- amendments to standard agreements on participation in the balancing group of SE Guaranteed Buyer and on the purchase and sale of electricity at FiT prices in terms of the possibility of offsetting counter-homogeneous claims;
- clarification of the deadlines for acquiring the user status of the register of guarantees of origin of electricity generated from RES and the transfer of these guarantees to SE Guaranteed Buyer.

Producers were required to renegotiate their agreements with SE Guaranteed Buyer by 1 January 2025.

#### **The right of SE Guaranteed Buyer to reduce settlement amounts with RES producers by the cost of unpaid deviations**

By the **Resolution No. 652** dated 3 April 2024<sup>69</sup>, the NEURC introduced amendments to the resolution "On Ensuring the Stable Functioning of the Electricity Market, Including the Financial Condition of Electricity Market Participants During the Period of Martial Law in Ukraine". These amendments expanded the rights of SE Guaranteed Buyer to reduce settlements with RES producers.

<sup>66</sup> <https://zakon.rada.gov.ua/laws/show/367-2024-%D1%80#Text>

<sup>67</sup> <https://zakon.rada.gov.ua/rada/show/v1381874-24#n3>

<sup>68</sup> <https://zakon.rada.gov.ua/rada/show/v2060874-24#n2>

<sup>69</sup> <https://zakon.rada.gov.ua/rada/show/v0652874-24#Text>

SE Guaranteed Buyer was granted the right to reduce settlements with RES producers by the cost of unpaid deviation, if the producer failed to compensate for it independently.

Since the beginning of the full-scale invasion, SE Guaranteed Buyer has had the right to reduce settlements with RES producers by the amount of unpaid imbalance. This measure was introduced to ensure:

- The possibility for a RES producer to remain in the balancing group of SE Guaranteed Buyer in case of failure to make such payment independently.
- Ensuring the uninterrupted operation of the electricity market under critical conditions.

### Law of Ukraine on the Regulation of Powers in the Field of Energy Efficiency

On 30 June 2024, the Law of Ukraine “On Amendments to Certain Laws of Ukraine Regarding the Regulation of the Powers of Central Executive Authorities in the Field of Ensuring Energy Efficiency” No. 3764-IX dated 4 June 2024<sup>70</sup> (Law No. 3764-IX) entered into force.

Law No. 3764-IX is aimed at improving certain provisions of Ukrainian legislation by optimizing the powers exercised by central executive authorities in the field of energy efficiency.

Among other things, the Law introduces amendments to the Law of Ukraine “On the Electricity Market” and the Law of Ukraine “On Green Transformation”.

In particular, according to the adopted amendments, if a RES producer, who is a participant in the balancing group of SE Guaranteed Buyer, has not brought an agreement for the purchase and sale of electricity at FiT prices into compliance with the standard form and has not concluded an agreement for participation in the balancing group of SE Guaranteed Buyer in accordance with the standard forms established by the Resolution of the NEURC No. 178 dated 24 January 2024, then, starting from 27 January 2024, and until the agreements are brought into compliance with the standard forms, SE Guaranteed Buyer shall purchase the electricity delivered to the grid and sell the electricity consumed from the grid by such a participant's installations

at imbalance prices in accordance with the market rules:

- electricity delivered to the grid by such installations shall be purchased at the price of a positive imbalance;
- electricity consumed from the grid by such installations shall be sold at the price of a negative imbalance.

Additionally, until the agreements are brought into compliance with the standard forms approved by NEURC Resolution No. 178 dated 24 January 2024, SE Guaranteed Buyer will not take into account the actual data of such power installations when calculating compensation for deviations between actual and forecasted hourly electricity supply volumes.

### NATIONAL PLANS, STATE POLICIES, AND STRATEGIES

The year 2024 was marked by the adoption of national plans that define the country's “green” course, namely the National Energy and Climate Plan until 2030 (*more details in section 2.2.*) and the National Renewable Energy Action Plan for the period until 2030 (*more details in section 2.3.*), as well as the Climate Policy Strategy of Ukraine until 2035. In addition, the Law of Ukraine No. 3991-IX “On the Basic Principles of State Climate Policy” was adopted. All these documents set strategic guidelines for sustainable development and the transition to RES.

The implementation of these plans will require coordinated cooperation between the state and businesses, as well as a structured approach to actions and resource allocation.

### Law of Ukraine “On the Basic Principles of State Climate Policy”

On 8 October 2024, Ukraine adopted Law No. 3991-IX (Law No. 3991-IX)<sup>71</sup> “On the Basic Principles of State Climate Policy”, which establishes the legal and organizational framework for the implementation of state climate policy.

Law No. 3991-IX is aimed at ensuring low-carbon and sustainable development of Ukraine, enhancing its environmental, energy, and food

<sup>70</sup> <https://zakon.rada.gov.ua/laws/show/3764-20#Text>

<sup>71</sup> <https://zakon.rada.gov.ua/laws/show/3991-20#Text>

security, achieving climate neutrality, adapting to climate change, and mitigating its consequences. It also establishes the framework for Ukraine's fulfilment of its international climate commitments, the principles of operation of the national climate monitoring and forecasting system, as well as other key aspects of climate policy.

For the effective implementation of Law No. 3991-IX, it is necessary to develop additional secondary legislation that will define detailed mechanisms for implementing the new policies.

#### **Climate Policy Strategy of Ukraine until 2035**

On 30 May 2024, the Cabinet of Ministers of Ukraine adopted Resolution No. 483-p, which approved the Strategy for the Development and

Implementation of State Climate Change Policy until 2035 and endorsed the Operational Action Plan for its Implementation in 2024-2026.<sup>72</sup> The purpose of this decision is to establish a state climate change policy aimed at achieving sustainable development, ensuring an effective transition to a low-carbon economy, and integrating state climate policy goals into the post-war reconstruction of Ukraine.

The Strategy will be implemented in four stages, each of which will involve the development and execution of an operational action plan for the respective period.

One of the key performance indicators for achieving the Strategy's goals is increasing the share of electricity generation from RES to 20% of Ukraine's total energy balance.

<sup>72</sup> <https://zakon.rada.gov.ua/laws/show/483-2024-%D1%80#Text>

## 4.2. EXPECTED REGULATORY AMENDMENTS IN THE WIND ENERGY SECTOR FOR 2025

A series of significant regulatory changes in the electricity market, particularly regarding renewable energy generation, are expected to be enacted. Below is an analysis of the key provisions of relevant draft documents that were published in 2024 or, in some cases, even adopted in January 2025.

### DRAFT LAW NO. 9381

As of January 2025, during the preparation of this review, the Verkhovna Rada of Ukraine approved in the second reading **Draft Law No. 9381**<sup>73</sup> dated 13 June 2023, titled “On Amendments to Certain Laws of Ukraine in the Energy Sector and the Heat Supply Sector to Clarify Provisions Related to the State of Martial Law in Ukraine” (*hereinafter referred to as Draft Law No. 9381*).

Draft Law No. 9381 proposes amendments to most legislative acts in the fields of electricity, heat, and water supply. Additionally, numerous provisions from Draft Law No. 11392 dated 2 July 2024, “On Amendments to Certain Legislative Acts of Ukraine to Simplify Business Operations,” and Draft Law No. 11301-d dated 3 September 2024, “On Amendments to the Law of Ukraine “On the Electricity Market” Regarding the Application of the Algorithm for Allocating Funds from a Specially Regulated Current Account,” which were actively discussed within the industry in 2024, were incorporated into the text of Draft Law No. 9381 for the second reading.

Among the key expected changes and innovations, the following should be highlighted:

- **Quota allocation auctions** – Draft Law No. 9381 establishes that a potential auction participant, either independently or with a joint ultimate beneficial owner, may receive up to 50% of the annual quota, as opposed to the previously fixed 25%.

- **Technical conditions and grid connections:**

1. The adopted Draft Law No. 9381 stipulates that technical conditions (*TC*) remain valid until the completion of the construction of the facility (*or its final phase*) for which they were issued, including cases where the parties to these TC (*the customer or the issuing entity*) change.

The basic validity period of TC is set at three years. However, upon payment of the connection fee, as determined by the TSC and DSC, approval of the project documentation with the TSO or DSO, and obtaining a construction permit, the validity of the TC is extended for the construction period of the final phase, provided that the total validity period does not exceed six years (*3+3 years*). If the project documentation is not approved or the connection fee is not paid before the TC expires, the connection agreement is terminated.

Connection service customers with existing TC will have three months from the law’s effective date to align their TC and connection agreements with legal requirements and nine months to submit project documentation.

For renewable energy producers who had valid connection agreements before the introduction of martial law and, by the time the law takes effect, have approved project documentation submitted to the TSO or DSO and have paid the connection fee as per the agreement, the TC will be automatically extended for three years.

2. Draft Law No. 9381 allows the connection customer, under legally and TSC-prescribed circumstances, to request TC from the TSO. A prepayment of EUR 10,000 per MW must be made, with 50% payable within 30 days and the remaining 50% within 12 months from the date of TC issuance.

<sup>73</sup> <https://itd.rada.gov.ua/billInfo/Bills/Card/42116>

For connection service customers with existing agreements, transitional provisions stipulate that the connection fee must be paid within nine months from the law's effective date as follows:

- 50% within 30 days from the date of invoicing, which must be issued no later than 100 days from the law's entry into force;
- 50% within six months from the date of payment of the first 50%.

3. A new concept of **capacity booking** is introduced, requiring that for the connection of wind farms exceeding 20 MW, the connection customer must sign a capacity reservation agreement with the TSO, under which the technical solutions for the connection scheme will be reserved for up to two years. These solutions may be revised at the customer's request. The reservation fee is EUR 5,000 per MW, payable to an escrow account within 20 calendar days from the agreement date. If a connection request is submitted, the reservation fee will be credited toward the connection cost. If no connection request is made, the funds will be transferred to the TSO's account.

4. The law also states that customers requiring non-standard connections above 1 MW may independently design electrical network equipment, perform construction and installation works for the linear connection part, and carry out commissioning works with approval from the DSO or TSO.

5. The law allows potential electricity producers to connect different energy-generating units using various energy sources at a single connection point (*cable pooling*), even if their combined capacity exceeds the permitted limit. However, the producer can only inject power into the grid within the allowed capacity, ensuring proper commercial metering for each type of installation.

- **The fulfilment of monetary obligations in the market** – Draft Law No. 9381 proposes the introduction of a provision that suspends the execution of executive actions and measures for compulsory enforcement of decisions (*including the imposition of asset and monetary seizures*) in executive proceedings for the collection of inflation index sums for the entire duration of the monetary obligation delay, 3% annual interest from the overdue monetary obligation sum, or other interest rates established by the contract

or law, penalty (*finer, late payment fees*) for delays in fulfilling monetary obligations as outlined in the relevant contracts. This provision will apply to all participants in the electricity market, including the relationships between SE Guaranteed Buyer and renewable energy producers.

- **REMIT** – Draft Law No. 9381 refines several provisions to prevent market abuse in wholesale energy trading, including:

1. Introduction of the concept of unplanned unavailability of power facilities and disclosure of insider information.

2. Clarification that failure to disclose or improper disclosure of insider information, or trading wholesale energy products without market registration, will no longer be considered market abuse. However, insider information will now include data that significantly impacts the market, available and unavailable capacity details, and information usable for transactions or bid submissions.

3. A legal provision allowing the regulator to withhold the publication of specific categories of information until one month after the end of martial law (*+month*).

4. Exclusion of all contracts with delivery locations outside Ukraine, including transmission capacity allocation contracts, from the list of wholesale energy products.

5. Adjustments to penalties and interest rates for non-payment of fines for market abuse (*from 1.5% to double the NBU's base rate*).

- **Other provisions:**

1. It is stipulated that until the end of martial law and for one year after its termination, surplus revenue from dispatch (*operational-technical*) management activities in 2023–2024 must be allocated as follows:

- 45% to settle debts in the balancing market;
- 45% to repay debts to the Guaranteed Buyer;
- 10% to settle debts with universal service suppliers to pay for electricity generated by private households using renewable energy.

2. DSO and TSO must establish geoinformation systems on their websites to provide potential producers with critical information for selecting construction sites.

3. ESS installed at renewable energy facilities can be charged both from their own generation and the grid. Such activities will not require licensing and can be performed within the connected capacity, provided proper commercial metering is ensured.
4. Electricity supplied by ESS will not be subject to market premium mechanisms.
5. Unauthorized electricity withdrawals are now formally defined, with penalties introduced.
6. Cogeneration units may operate under self-production mechanisms without licenses if they meet legal requirements.
7. Active consumers may generate electricity without a license for capacities up to 20 MW (previously 5 MW).

- maintain a unified database, develop standardized insurance products (*with predefined tariff formulas*), establish underwriting policies, and regulate claims settlements. The agency's funding will come from statutory capital, budget allocations (*if included*), operating revenues, and financial aid;
- Possibility of war risk insurance coverage both through the agency and authorized insurance companies, including non-resident reinsurers;
- Approval of the war risk insurance system's structural levels and retention limits for each participant;
- Mandatory insurance for property pledged as collateral/mortgage (*for the duration of the respective contract*) and construction projects (*for the construction period*). The agency may adjust the list of insured objects, and special insurance conditions will apply to assets located in high-risk territories;
- Determination of a franchise percentage not exceeding 15% of the insured sum under the contract.

#### **DRAFT LAWS PENDING CONSIDERATION BY THE VERKHOVNA RADA OF UKRAINE**

Draft Law No. 12372 dated 30 December 2024<sup>74</sup>, “On the System of War Risk Insurance” (“Draft Law No. 12372”), proposes to establish new approaches for creating a war risk insurance system aimed at protecting the insurance interests of individuals and legal entities. As noted in the 2023 Review, comprehensive war risk insurance is crucial for prospective and further investment in the energy sector, particularly in the restoration and development of renewable energy sources, including wind energy projects.

Draft Law No. 12372 is intended to address this issue by setting general principles for the operation of participants in the war risk insurance system, defining the assets subject to mandatory insurance, and establishing conditions and procedures for concluding insurance contracts within the war risk insurance system.

Key provisions of Draft Law No. 12372 include:

- Introduction of terms such as “war risks,” “high-risk territory,” “war risk insurance/reinsurance contract,” and “war risk insurance system”;
- Establishment and legal definition of the State Agency’s status and the authority of government bodies within the war risk insurance system. The agency will independently provide insurance coverage while simultaneously acting as a guarantor for obligations undertaken by authorized insurers and intermediaries. Additionally, it will

The procedure for determining the insured amount and tariffs under Draft Law No. 12372 falls under the authority of the agency.

Draft Law No. 12386 dated 08 January 2025<sup>75</sup>, “On Amendments to Certain Laws of Ukraine to Improve the Functioning of Industrial Parks and Introduce the Eco-Industrial Park Model in Ukraine” (“Draft Law No. 12386”), proposes amendments to the Law of Ukraine “On Industrial Parks” to clarify requirements regarding documentation, procedures, rights, obligations, and relationships among industrial park stakeholders during the establishment and operation of such parks. Draft Law No. 12386 also refines the list of economic activities permitted within industrial parks, notably including alternative energy activities among the approved sectors.

Additionally, Draft Law No. 12386 introduces the concept of an “eco-industrial park,” under which the managing company and park participants (*at least five entities*) will engage in industrial symbiosis by utilizing renewable energy sources for both electricity and heat supply, processing waste, and optimizing primary and secondary resource potential. The status of an eco-industrial park will be granted upon the managing company’s request. Furthermore, the Draft Law No. 12386 refines reporting requirements for managing companies, including the implementation of ESG measures, increasing energy independence, and adopting zero-waste practices.

<sup>74</sup> <https://itd.rada.gov.ua/BILLINFO/Bills/Card/55532>

<sup>75</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/55571>



14

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Our team of experienced lawyers will help you deal with a wide range of legal issues:

- ◆ supporting activities in the energy markets;
- ◆ implementation of the full cycle of renewable energy project development, construction of electricity facilities ;
- ◆ protection of interests before public authorities and in courts.

Draft Law No. 11455 dated 30 July 2024<sup>76</sup> – “On Amendments to Section XXI “Final and Transitional Provisions” of the Customs Code of Ukraine to Facilitate the Restoration of Ukraine's Alternative Energy Infrastructure” (“Draft Law No. 11455”). This draft law is of critical importance to Ukraine’s wind energy sector. It seeks to address significant gaps in defining the list of goods exempt from VAT and import duties during importation – an oversight in the previously adopted laws:

- Law of Ukraine No. 3853-IX dated 16 July 2024, which amended the Tax Code to exempt VAT on imports of goods for the production and/or repair of mechanized demining machines;
- Law of Ukraine No. 3854-IX dated 16 July 2024, which amended the Customs Code to exempt import duties on goods needed for energy infrastructure restoration and national security.

Specifically, Draft Law No. 11455 provides for the exemption from VAT and import duties (*until 31 December 2025*) on the import of wind energy generator units classified under code 8502 31 00 00 according to the Ukrainian Classification of Goods for Foreign Economic Activity (*UCG FEA*). Reducing financial burdens on the most expensive aspect of renewable energy projects – the procurement of equipment – will accelerate the construction of projects planned by investors.

Draft Law No. 12087 dated 02 October 2024<sup>77</sup>, “On Amendments to the Laws of Ukraine Regarding the Integration of Electricity Markets of Ukraine and the European Union” (“Draft Law No. 12087”) aims to implement certain provisions of the Energy Community acquis, which serve as a prerequisite for the integration of the Ukrainian and EU electricity markets. The draft law provides for the creation of a reliability reserve for transmission capacity and the optimization of the allocation and utilization of cross-border transmission capacity, coordinated through price-based mechanisms in the day-ahead and intraday markets.

Draft Law No. 12087 introduces a mechanism for planning readiness to mitigate risks related to electricity supply security, prevent and manage crises in the electricity sector, and designate a competent authority responsible for crisis prevention and management. The crisis management measures include the development of crisis response plans

and strategies, the establishment of response protocols with pre-emptive identification of potential crises, and coordination with the EU in this regard. Additionally, Draft Law No. 12087 defines the rights and obligations of the nominated operator as an entity responsible for market integration, the criteria for the appointment of the nominated market operator (*envisioned as the actual coordinator, arbitrator, and regulator of the market*), and the primary functions of the central counterparty (*either the nominated operator itself or an entity authorized by it to perform certain functions*) and the trading agent (*responsible for the physical execution of trading participants’ bids*).

Furthermore, Draft Law No. 12087 establishes the need for transparency and economic justification in setting transmission and distribution tariffs, along with corresponding adjustments to the tariff-setting methodology. It clarifies the operational framework of markets, particularly the balancing market.

The draft law also defines the procedures and necessity for interaction between the national regulator, operators, and relevant European regulatory bodies and operators to ensure joint oversight and compliance with market operation rules (*Ukraine-EU*). The objective of this cooperation is to expand access for Ukrainian market participants to the integrated European electricity market and vice versa – enabling European market participants to access Ukrainian consumers. An example of such cooperation is the requirement for national operators and market participants to comply with ACER decisions. Additionally, if a national or European resource adequacy assessment (*a report developed by the Transmission System Operator, with its requirements clarified and expanded in the draft law*) identifies resource adequacy issues, the regulator and TSO must jointly develop corrective measures. Such measures may include adjusting or removing price caps and eliminating state intervention in price-setting. Temporary capacity support mechanisms, procurement of flexibility services in the distribution system, or measures to reduce congestion may also be implemented to address resource availability challenges.

Draft Law No. 12087 also regulates the approval process for constructing cross-border transmission lines. Of particular relevance to major market players,

<sup>76</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/44651>

<sup>77</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/44974>

the draft law mandates that owners of generating facilities with a unit capacity exceeding 200 MW or a total capacity exceeding 400 MW retain records of operational dispatch decisions for 5 years.

The proposed innovations in Draft Law No. 12087 aim to enhance the role of consumers in the electricity market, including the introduction of smart meters, further regulation of the active consumer status and self-generation mechanisms, the establishment of community energy associations, and the expansion of demand response resource utilization (*either independently or through an aggregator*). Moreover, the draft law introduces the concept of energy poverty and revises approaches to protecting vulnerable consumers.

An alternative to the aforementioned Draft Law is Draft Law No. 12087-1 dated 18 October 2024<sup>78</sup>, “On Amendments to Certain Laws of Ukraine Regarding the Implementation of European Law Norms for Energy Market Integration, Enhancement of Supply Security, and Competitiveness in the Energy Sector” (“Draft Law No. 12087-1”). As stated by the authors in the Explanatory Note, this draft represents a more adapted approach to implementing the *acquis* provisions, aiming to expand regional cooperation while ensuring electricity supply security through cross-border exchange mechanisms and maintaining the liquidity of Ukraine’s internal electricity market.

Additionally, Draft Law No. 12208, dated 14 November 2024<sup>79</sup>, “On Amendments to the Law of Ukraine ‘On Critical Infrastructure’ Regarding the Implementation of Directive (EU) 2022/2557 of the European Parliament and of the Council dated 14 December 2022, on the Resilience of Critical Entities and Repealing Council Directive 2008/114/EC” (“Draft Law No. 12208”), establishes the legal and organizational framework for the creation and operation of a national system for critical infrastructure resilience in accordance with Directive (EU) 2022/2557. This Directive outlines the procedure and frequency of national risk assessments, the duties and powers of national system entities concerning the resilience of critical infrastructure, the procedure for identifying critical infrastructure operators, and the adoption of a unified approach to risk assessment and management in line with best European and international practices. It also aims

to enhance the ability of critical entities to provide essential services in response to various risks.

Draft Law No. 12208 introduces terminology in the context of critical energy infrastructure protection and its key sectors. It provides for the identification and registration of critical infrastructure operators, defines ownership rights over critical infrastructure facilities, establishes a national system for critical infrastructure resilience, and specifies its organization, functioning, inspection mechanisms, and penalties for violations.

## EXPECTED LEGISLATIVE INITIATIVES OF THE NEURC

By its Resolution No. 2018, dated 10 December 2024<sup>80</sup>, the Regulator approved the “Activity Plan for the Preparation of Draft Regulatory Acts for 2025”. According to this plan, in 2025, NEURC intends to prepare a draft regulatory act amending Article 97 of the Law of Ukraine “On Alternative Energy Sources,” which will regulate issues related to the recognition, outside Ukraine’s customs territory, of guarantees of origin for electricity produced from RES and issued in Ukraine.

Additionally, the consideration of the following draft laws may continue:

1. Draft Law “On Amendments to Certain Laws of Ukraine Regarding the Transposition of Energy Community Acts”<sup>81</sup> – This draft law aims to implement directives similar to those proposed in Draft Law No. 12087 dated 2 October 2024<sup>82</sup>, titled “On Amendments to the Laws of Ukraine Regarding the Integration of Electricity Markets of Ukraine and the European Union.” The draft law establishes the conditions for the operation of a nominated market operator, provides for electricity supply to consumers under contracts with dynamic pricing, introduces tools for comparing electricity suppliers’ offers, and regulates the activities of citizen energy communities. It also facilitates the integration of Ukraine’s national spot electricity markets with pan-European markets by implementing the single day-ahead market coupling and the single intraday market coupling. Furthermore, it ensures the participation of the transmission system operator in European balancing platforms for

<sup>78</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/45079>

<sup>79</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/45218>

<sup>80</sup> <https://www.nerc.gov.ua/acts/pro-zatverdzhennya-planu-diyalnosti-nacionalnoyi-komisiyi-shcho-zdiysnyuye-derzhavne-regulyuvannya-u-sferah-energetiki-ta-komunalnih-poslug-z-pidgotovki-proyektiv-regulyatornih-aktiv-na-2025->

<sup>81</sup> <https://www.nerc.gov.ua/news/oprylyudnyuyetsya-proyekt-zakonu-ukrayini-pro-vnesennya-zmin-do-deyakih-zakoniv-ukrayini-shchodo-transponuvannya-aktiv-energetichnogo-spivtovaristva>

<sup>82</sup> <https://itd.rada.gov.ua/billinfo/Bills/Card/44974>

reserve exchange and cross-border balancing. The deadline for fulfilling this obligation under the Ukraine Facility is the fourth quarter of 2025.

2. **Draft Law “On Amendments to Certain Laws of Ukraine to Strengthen the Independence of the Regulator in the Energy and Utility Sectors”<sup>83</sup>** – This draft law has been developed to fulfil Ukraine’s commitments under the Energy Community Treaty, the Association Agreement, and the Ukraine Facility Plan. The core provision of the draft law is the complete removal of NEURC from the management and control of the Cabinet of Ministers of Ukraine, including matters related to determining salaries and bonuses, approving staff numbers, reviewing and annulling decisions, and optimizing the appointment terms of commission members under the CMU’s quota. Additionally, the draft law provides for optimizing the rotation of NEURC commission members, establishes a maximum of two terms for commission membership, stipulates that NEURC decisions and resolutions take effect upon publication on its website, expands the grounds for conducting unscheduled inspections, and introduces the possibility of sending inspection-related documents exclusively via email.

However, one controversial aspect of this draft law is the provision that removes Regulator employees from the status of civil servants. This measure does not directly affect the independence of the institution but rather serves as a general instrument for ensuring transparency in its activities.

## CHANGES PLANNED IN NATIONAL STRATEGIC DOCUMENTS

There are also a number of potential legislative changes that, as of the date of this Review, have not yet been formalized into draft laws or other regulatory acts but are envisaged by certain strategic national documents.

According to Section 6 of the Action Plan in accordance with the European Commission’s proposal regarding “Regulation (EU) 2024/792 of the European Parliament and of the Council dated 29 February 2024 on the establishment of the

Ukraine Facility” (*hereinafter referred to as the Ukraine Facility Plan*), amendments to the legal framework governing the PSO mechanism are scheduled for 2025. The planned changes envisage the structural separation of PSO implementation activities for all state-owned companies subject to such obligations by allocating separate accounts for PSO within these companies. This separation aims to prevent the use of state funding allocated for fulfilling PSO from cross-subsidizing other types of activities. As part of these changes, by the second quarter of 2025, the implementation of a Roadmap for separating the RES surcharge from the transmission tariff is planned.

In this context, it is worth noting that last year, the USAID Energy Security Project worked on the Green Book, which examined the issue of debt repayment in the electricity market. Special attention was given to addressing the causes of the current debt owed by the State Enterprise Guaranteed Buyer to RES producers under the “green” tariff. As a result of the conducted analysis, a Roadmap was developed, proposing a restructuring of the RES support financing scheme.

Thus, the Roadmap provides for:

- reviewing the level of the transmission tariff and approving an economically justified tariff, taking into account the need to settle the debt;
- developing a methodology for forecasting the annual cost of the RES PSO service and a procedure for calculating the cost of the RES PSO in case of changes to the regulatory formula;
- improving payment discipline, including by granting consumers the status of “pre-default” and “default”, as well as introducing special accounts for special categories of consumers;
- defining the RES surcharge and acknowledging its status as subject to state regulation in the market
- introducing a methodology for setting the RES surcharge;
- introducing a single bill for transmission services, including the RES surcharge as a separate line (*in case of partial payment of bills by end consumers, suppliers must transfer the RES surcharge in proportion to the share of payment for transmission services and the RES surcharge indicated in the bill issued by the TSO*).

<sup>83</sup> <https://www.nerc.gov.ua/news/oprilyudnyuyetsya-proyekt-zakonu-ukrayini-pro-vnesennya-zmin-do-deyakih-zakoniv-ukrayini-shchodo-posilennya-nezalezhnosti-regulyatora-u-sferah-energetiki-ta-komunalnih-poslug>

At the same time, after a detailed analysis of the Green Book's provisions, the UWEA concluded that the proposed solutions for addressing critical issues in the RES sector are unfounded and do not guarantee positive outcomes for the industry. UWEA experts assert that the root cause of market debt is not the PSO model itself but rather the lack of payment discipline among TSO counterparties, the annual approval of the transmission tariff without accounting for unmet obligations of the TSO to the "Guaranteed Buyer," and the failure to revise this tariff throughout the year despite prior commitments.

Furthermore, experts question the imperative nature of implementing the changes proposed in the Green Book and the Roadmap. The justification for these measures in the Green Book is based on the intent to adopt the best European practices. However, neither the Ukraine Facility Plan nor key European sectoral Directives – such as Directive (EU) 2019/944 and Directive (EU) 2018/2001 – contain a direct requirement for Ukraine to separate PSO from the transmission tariff. In light of this, UWEA is convinced that implementing any of the PSO mechanism modifications proposed in the Green Book will deteriorate the financial standing of RES producers and halt new investments in the sector.

UWEA has officially communicated its position to stakeholders involved in the development of the Roadmap and hopes that it will be considered in the approval process.

Furthermore, according to the Ukraine Facility's plan, the following steps are envisaged to be taken by the fourth quarter of 2025:

- Adoption of legislation for the electricity integration package, which will approximate national legislation to EU regulations such as the Electricity Directive (EU) 2019/944 (*recast*), the Electricity Regulation (EU) 2019/943 and the Risk Preparedness Regulation (EU) 2019/941 (*recast*), ACER Regulation (EU) 2019/942, as well as guidelines for forward capacity allocation, guidelines for capacity allocation and congestion management, instructions for electricity balancing, system operation instructions, and the network code on emergency and recovery;

- Appointment of a nominated electricity market operator, which is provided for in the European integration laws mentioned above;
- Determination of a special status for the NEURC.

Furthermore, under the **National Renewable Energy Action Plan for the period until 2030**, intensive development of wind energy generation is foreseen, reflected in the following planned regulatory measures:

- Development of a draft regulatory act to simplify the permitting procedures for the construction and connection of renewable energy facilities to the grid by the fourth quarter of 2025;
- Amendments to state standards in the field of alternative energy sources to assess the environmental impact of their requirements, particularly concerning biodiversity impact indicators and assessment formats (*for baseline condition evaluation, probable impact forecasting, and post-project monitoring organization*).

Additionally, according to the Operational Plan of Measures for 2024–2026 under the **Distributed Generation Development Strategy until 2035**, proposals for legislative amendments to implement the concepts of citizen energy communities and renewable energy consumer communities must be developed by 31 May 2025. These amendments align with Article 16 of Directive (EU) 2019/944 of the European Parliament and of the Council dated 5 June 2019 on common rules for the internal electricity market and amendments to Directive 2012/27/EU, as well as Article 22 of Directive (EU) 2018/2001 of the European Parliament and of the Council dated 11 December 2018 on the promotion of energy from renewable sources.

Moreover, according to the draft **Action Plan for the Implementation of Ukraine's Energy Strategy until 2050**, the release of unused grid capacity for new solar and wind installations is planned for 2025. This measure will be carried out by analyzing the potential volume of unused grid capacity and introducing corresponding amendments to the Grid Code, Market Rules, and Electricity Supply Rules. The document also provides for developing a regulatory act to enhance auction regulation for support quota allocation, which will amend the application of the

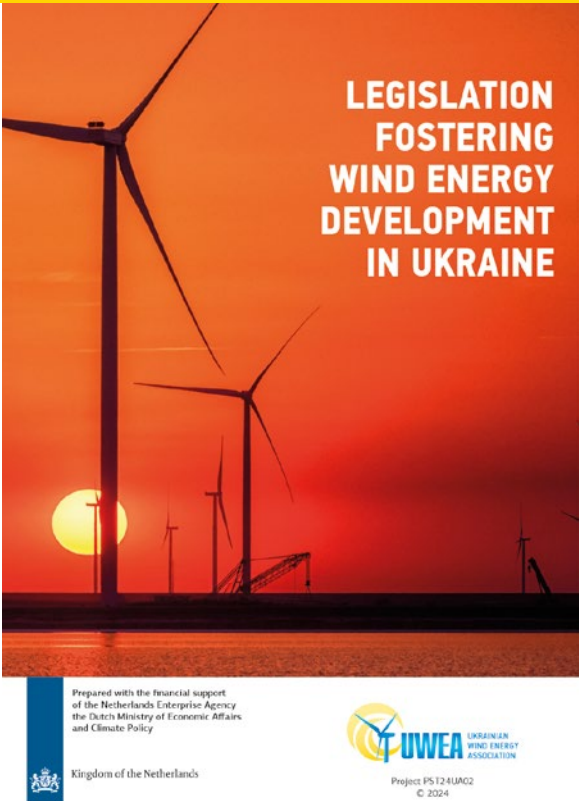


market price mechanism in the auction model and improve auction procedures.

On top of that, the market expects improvement in the conditions for supporting the industry in 2025, which have been repeatedly brought to the public by the UWEA, including:

- Granting benefits to consumers who have signed corporate PPAs with RES producers, such as lifting electricity supply restrictions for such consumers;
- Establishing a Minimum Price Guarantee Fund to insure market risks and support project bankability;
- Extending the validity of the rule establishing a cash method for taxpayers supplying, transmitting, distributing electricity, providing services in the public interest in electricity market operation, and/or load reduction services (*currently set to expire on 1 January 2026*).

# 4.3. LEGISLATIVE CHANGES TO STIMULATE THE DEVELOPMENT OF THE WIND ENERGY SECTOR IN UKRAINE: MARKET PROPOSALS



Energy Association with financial support from the Netherlands Enterprise Agency of the Ministry of Economic Affairs and Climate Policy of the Kingdom of the Netherlands (RVO).

The project “Legislation Fostering Wind Energy Development in Ukraine” was initiated to assess the current regulatory framework governing the electricity market, renewable energy, and specifically wind energy in Ukraine. Its goal is to compile a comprehensive list of legislative and regulatory amendments necessary in the medium term to preserve and fully utilize the existing potential of wind energy in Ukraine.

Leading law firms specializing in energy law, including LCF, Asters, INTEGRITES, Dentons, ARZINGER, and DTEK Renewables, all members of UWEA, contributed to the development of the report.

The proposed legislative changes in the report encompass environmental, construction, land, and other aspects of the development and implementation of wind energy projects, as well as issues related to the grid connection. All objectives, tasks, and outcomes of this report align with current EU legislation, which designates the development of wind energy in member states as a matter of “overriding public interest”.

On 10 October 2024, the Embassy of the Kingdom of the Netherlands in Ukraine hosted the official presentation of the report titled “Legislation Fostering Wind Energy Development in Ukraine”. This report was drafted by the Ukrainian Wind





The report consists of two main parts:

- A comprehensive analysis of gaps and proposals for the development of the legislative framework for wind energy projects in Ukraine.
- Detailed legislative initiatives aimed at addressing the identified gaps in renewable energy legislation, particularly in wind energy, based on a thorough assessment of Ukraine’s valid renewable energy laws as of 01 June 2024.

The proposed legislative initiatives are based on a comprehensive evaluation of renewable energy legislation as of 01 June 2024.

The report analyzes key challenges faced by companies developing electricity generation projects from alternative sources and proposes the following solutions:

- Simplifying urban planning procedures: reducing timelines and streamlining the approval process for detailed territorial plans to expedite the construction of wind energy facilities;
- Optimizing environmental procedures: simplifying environmental impact assessments and strategic environmental evaluations to reduce bureaucratic obstacles;
- Defining the legal status of “pre-agreed damages”: establishing clear legal regulations for compensation due to delays in project execution;
- Standardizing permit issuance timelines: Harmonizing the timelines for issuing permits for transportation and aviation approvals to prevent delays;
- Regulating servitude issues: simplifying procedures for using land plots for constructing facilities and access roads;
- Removing restrictions on the use of water fund lands: allowing the use of such lands for placing renewable energy facilities;
- Extending the validity period of technical conditions: increasing the duration of technical conditions for grid connection;

- Improving equipment operation rules: removing restrictions on the capacity and types of equipment for power plants;
- Regulating the operation of energy storage systems: creating legal conditions for the use of energy storage systems;
- Ensuring reliable grid connection: simplifying connection procedures at the initial stages of construction;
- Enhancing the methodology for assessing the state of electrical networks: developing more accurate methods for evaluating the potential for connecting new facilities;
- Developing investment support mechanisms: creating incentives to attract investments in renewable energy;
- Implementing mechanisms for cross-border electricity export: establishing conditions for exporting “green” electricity to other countries.

Addressing these challenges requires comprehensive legislative changes and active collaboration between the government, developers, and international partners. Implementing the proposed solutions will not only promote the development of wind energy but also bring Ukraine closer to achieving its climate goals and energy independence.

The full analysis, conclusions, and recommendations in the form of proposed amendments to national legislation, developed as a result of this report, have been submitted for consideration to the Office of the President of Ukraine, the Ministry of Energy of Ukraine, the NEURC, and relevant committees of the Verkhovna Rada of Ukraine.

As sections of the draft report were completed, they were shared with wind energy sector stakeholders for review and feedback. In December 2024, the report was reviewed at a meeting of the NSDC.

As of January 2025, the Verkhovna Rada of Ukraine adopted as a basis **Draft Law No. 9381 dated 13 June 2023 titled “On Amendments to Certain Laws of Ukraine in the Field of Energy and Heat Supply Regarding Clarification of Provisions Related to the Operation of Martial Law in Ukraine.”** This draft law incorporates several key proposals from the report “Legislation Fostering Wind Energy Development in Ukraine”. Notably, it addresses the capacity booking, extends the validity period for technical conditions related to grid connections, and lifts restrictions on power plant capacity and equipment types.

# **V** UWEA ACTIVITIES



## 5.1. ACHIEVEMENTS OF THE YEAR

Throughout 2024, the UWEA continued to play a pivotal role in the deployment of wind technologies in Ukraine, proactively supporting the integration of RES into the national energy system and driving legislative and regulatory reforms. To this end, the Association carried out large-scale projects and initiatives aimed at implementing modern market mechanisms, enhancing international cooperation, and strengthening investors' positions in the market.

Letters and appeals sent by the UWEA, either independently or in cooperation with other RES industry associations, to state authorities and international partners remain a key tool for promoting wind and other technologies and removing barriers to large-scale RES deployment. Thus, in 2024, 41 letters by the UWEA and 29 ones co-authored by other RES industry associations, addressed various urgent market and regulatory issues.

Effectively leveraging market mechanisms to stimulate RES development continues to be a priority for the Association. During the year, UWEA experts worked on implementing and improving mechanisms such as corporate PPAs, "green" auctions, and the FiP. The UWEA actively participated in refining the legislative framework for these mechanisms, highlighting deficiencies hindering their effective utilisation. The Association prepared and submitted several recommendations to enhance the efficiency of the FiP mechanism, improve the attractiveness of corporate PPAs, and optimize auction design.

The increase in the UWEA membership is a remarkable achievement, reflecting the Association's active engagement and strong market presence. Over the year, 22 new companies joined the UWEA, including 8 international companies, bringing the total membership to 102. The Association also expanded its network of partners by signing several Memoranda of Cooperation and Partnership with various national and international stakeholders, including the Dutch industry association NedZero and the Institute of General Energy at the NAS of Ukraine.

The strengthening of cooperation with international wind energy companies and partner organisations last year is attributed to the UWEA's increased representation, along with the Ukrainian wind energy market's growing presence on the international stage at industry events, exhibitions, seminars, and B2B meetings. A landmark



presentation of Ukraine's wind energy market abroad was the UWEA's participation in the world's largest onshore and offshore wind energy exhibition, WindEnergy Hamburg, held biennially in Hamburg, Germany, which celebrated its 10th anniversary in 2024. The Ukrainian pavilion, bearing the slogan "W(i)ndependence: Freedom Through Energy," garnered significant attention from participants. UWEA's participation in other major events was equally successful, including the German-Ukrainian business dialogue on rebuilding Ukraine through renewable energy, held as part of the Ukraine Recovery Conference; the 19th PSEW Conference in Świnoujście, Poland; the annual WindEurope conference and exhibition in Bilbao, Spain; and the offshore wind energy conference and exhibition in Amsterdam, Netherlands. The latter event was part of a week-long working visit of the UWEA Secretariat to the Netherlands, organized with support from the Embassy of the Kingdom of the Netherlands in Ukraine and the Netherlands Enterprise Agency (RVO) of the Dutch Ministry of Economic Affairs and Climate Policy. These events served as effective platforms for showcasing the Ukrainian wind energy market and its projects, attracting investors to Ukraine, discussing the current needs of the energy sector, and highlighting the ongoing energy terror that Russia continues to inflict on Europe and the world at Ukraine's expense. International media outlets, including RECHARGE, WINDPOWER Monthly, CEEnergy News, Montel, and others, also remained vital tools for UWEA's communication with the global wind energy community.

In 2024, the close collaboration between the UWEA and the NREL resulted in the creation of a unique Wind Energy Atlas of Ukraine. This innovative tool, integrated into the RE Data Explorer platform,

provides open access to highly accurate data on Ukraine's wind potential. The data is based on wind measurement studies conducted across Ukraine by UWEA member companies.

Education and public engagement remain integral parts of UWEA's activities. In February, UWEA presented the benefits of wind energy projects for local communities during a thematic session titled "Public-Private Partnerships as a Tool for Enhancing Financial Capacity of Communities" at the "Rebuilding in Action 2.0" forum. In May, in partnership with the member company Atlas Volovets Energy, UWEA organized a series of lessons for middle school students in the Zakarpattia region. In December, the Association participated in a workshop titled "Partnership for Sustainable Recovery of Ukraine," which involved communities from various regions. Additionally, the Secretariat and Board members maintain open communication with the public through national and regional media. UWEA's consistent media partners include Interfax-Ukraine, Energy Business, Energoreforma, Obozrevatel, EPravda, Gordon, EXPRO, and television channels such as Pryamyi and ICTV.

Volunteering, with its profound humanitarian contribution, remained a significant aspect of the UWEA's activities last year. Through the #Renewables4Ukraine initiative, and with the support of the Finnish non-profit organization EKOenergy and WWEA, the UWEA continued to coordinate efforts to improve energy efficiency and independence of socially significant facilities, such as kindergartens in regions most affected by Russia's large-scale invasion of Ukraine. In spring 2024, rooftop solar power stations comprising photovoltaic panels, batteries, and inverters were installed at preschool facilities, including the Dzhhereltse preschool unit of the Irpin Gymnasium "Osvita" and later in the Pinocchio kindergarten in Borodianka, both in Kyiv region. By the end of the year, similar projects were implemented at the Kazka preschool in Borodianka, and the project for the Svitlyachok kindergarten in Myrhorod, Poltava region, was launched.

A major achievement in this area was the signing of a Memorandum of Cooperation and Partnership in 2024 between the charitable organization "Vidvazhnykh" and WWEA. Earlier, similar Memoranda were signed with the Irpin Recovery Fund and the Irpin City Council. Overall, since the initiative's inception in 2022, autonomous energy equipment has also been supplied to the Irpin City Primary Health Care Centre, the Kozyntsi Family Medicine Outpatient Clinic in Bucha District, and the Irpin Lyceum of Innovative Technologies, all in the Kyiv region.

Recognising the urgency of transformative changes in the energy sector, UWEA has committed itself to strengthening its role in advancing the energy transition. To this end, the Association approved a forward-looking strategy during its Board meeting held on 25 October 2024, in a hybrid format in Kyiv. Key topics discussed at the meeting included the establishment of a Commercial Risk Guarantee Fund, initiatives to encourage electricity consumers to enter into corporate PPAs, the effectiveness of state policies in developing RES, particularly wind energy, and the current status of small-scale and offshore wind energy markets in Ukraine. Additionally, discussions were held on launching a market for wind projects utilizing refurbished wind turbines.

In 2024, UWEA also witnessed a renewal in its Board composition. New Board members include Natalia Hutariyevych, Senior Legal Counsel at Sayenko Kharenko and a member of UWEA's Legal Committee, and Oleksandr Molyboh, Chief Energy Engineer at Wind Farm LLC.

Temporarily stepping down from the Board was Ruslan Soyчук of Vindkraft Ukraina LLC.

Commenting on these changes, despite the challenges and barriers that continue to hinder the large-scale development of wind energy in Ukraine, the Secretariat, Board, and UWEA member companies remain steadfast in their efforts to achieve Ukraine's energy independence, security, sustainability, decentralisation, and decarbonisation through the expansion of wind power generation. The effectiveness of this market and its strategic importance during wartime are evidenced by both implemented and planned wind energy projects, which have been highlighted in earlier sections of this Overview.

Additionally, the significant achievements and effective activities of the UWEA and its member companies, particularly DTEK Renewables and Eco-Optima, were recognised in 2024 with the "Green Heart" award.



**Andriy Konechenkov,**  
Chairman of the  
UWEA Board



*"We strive to ensure maximum representation of key wind farm operators and developers on the Board while steadily moving toward gender balance in its composition."*

“We Believe in What We Do”, – this is the core message of the final press conference of the UWEA, summarizing the development of Ukraine's wind energy market in 2024. The press conference, which took place in mid-December 2024 at the Interfax-Ukraine media center, featured UWEA Board members and representatives of the Ukrainian wind energy business. They discussed key trends that shaped the market's development over the

year, including the investment climate, regulatory changes, innovative solutions, and approaches.

All these accomplishments have been made possible through effective collaboration with international partners, governmental bodies, public and private market participants, experts, scientists, and civil society representatives.



*The UWEA extends its heartfelt gratitude to all partners who supported its mission in 2024, working together toward shared goals and societal interests! The Association is also deeply thankful to all its member companies for their trust, open dialogue, active support of initiatives, and efforts for the benefit of Ukraine and its energy system as a whole!*

## 5.2. WIND ENERGY TECHNOLOGIES FOR UKRAINE'S ENERGY SYSTEM RECOVERY

Despite the immense challenges of the war, the UWEA in 2024 focused on integrating RES into the post-war recovery processes. Priorities included decentralising the energy system, enhancing its resilience, and ensuring Ukraine's energy independence. The UWEA played a key role in reforming approaches to wind energy project implementation, collaborating with international partners and state institutions to foster conditions for rebuilding infrastructure rooted in sustainability and innovation.

### PROSPECTS FOR CONNECTING WIND ENERGY PROJECTS TO THE POWER GRID

The connection of wind energy projects to the power grid was a cornerstone of UWEA's activities in 2024. On 06 February, the Association participated in the seminar "Prospects for Connecting Wind Energy Projects to the Power Grid," organised by the law firm Asters, the UWEA member. The seminar explored reforms to streamline the issuance of technical conditions for connecting wind energy projects and optimising associated costs.

Oleksandr Zhyhaliuk, Head of the Transmission System Development Department at NPC Ukrenergo, highlighted that, before the full-scale war, technical conditions for connecting 17 GW of new RES capacities had been issued, elevating the importance of balancing the system. Pre-war assessments indicated the need for 1.4 GW of manoeuvrable gas turbine units and approximately 700 MW of energy storage systems to stabilise the grid. He also noted that TSO has developed several projects, including international ones, aimed at restoring and stabilising the grid, thereby enabling greater RES integration.

### RECONSTRUCTION IN ACTION 2.0 FORUM-WORKSHOP

On 14 February 2024, the "Reconstruction in Action 2.0" forum-workshop was held as part of the KyivBuild Ukraine international construction exhibition. The event gathered leading Ukrainian and international construction experts, representatives of government bodies, local authorities, and international organisations.

The forum served as a key platform to address pressing issues, as Ukraine not only defends its territories against Russian aggression but also lays the foundation for large-scale post-war recovery. Sustainability, innovation, and energy efficiency were emphasised as the guiding principles of this process.

Andriy Konechenkov, Chairman of the UWEA Board, was among the speakers at the first session, "Public-Private Partnership as a Tool to Enhance Communities' Financial Capacity," organised by the Irpin recovery Fund. Mr. Konechenkov stressed that rebuilding Ukrainian communities must adhere to principles of sustainable development with RES at its core. He underscored the importance of state-business cooperation, particularly in heavily affected cities such as Irpin and Borodianka, not only for restoring infrastructure, but the transition to decentralised, environmentally friendly energy sources such as wind, solar, and biomass.

He also presented examples of successful projects equipping social sector facilities with solar systems in Bucha District, **implemented in partnership with the UWEA** and international collaborators. These initiatives illustrate practical ways to integrate renewable energy into the recovery process.



### ENERGY SECURITY TALKS: ANOTHER “WARTIME” WINTER BEHIND. STATUS OF THE NATIONAL IPS

On 06 March 2024, Andriy Konechenkov, Chairman of the UWEA Board, spoke at the online event “Energy Security Talks: Another “Wartime” Winter Behind. Status of the National IPS,” organised by NGO DiXi Group within the framework of the “Improving Tomorrow’s Energy Security” project, supported by the International Renaissance Foundation.

The event featured experts, including Ukraine’s Former Deputy Minister of Energy Svitlana Hrynchuk and NPC Ukrenergo Chief Dispatcher Vitalii Zaichenko, who discussed the status of the national IPS following the second wartime heating season, energy resource reserves, and the measures being undertaken to prepare for the next winter and enhance Ukraine’s energy security.

In his speech, Konechenkov emphasised optimising RES utilization to ensure system resilience during future heating seasons. He highlighted state-level challenges that need to be addressed for effective RES implementation. He also pointed out some of wind power’s advantages: its resilience to aerial attacks, widespread distribution across Ukraine, and the strong interest of international investors.

### IV ENERGY LAW CONFERENCE

For the fourth consecutive year, the UWEA actively participated in the Energy Law Conference organised by the UBA. The IV Energy Law Conference, held on 05 July 2024, in Kyiv, became a platform to discuss critical challenges and opportunities in Ukraine’s energy sector.



The event, focused on the future development of Ukraine’s energy sector, addressed vital topics such as achieving energy independence by increasing natural gas production and developing RES. Attention was also given to European integration, including the impact of EU accession negotiations on the energy sector and the steps required to align with European standards.

Key discussions included implementing Ukraine’s Energy Strategy through 2050 and the NECP through 2030. Particular focus was placed on launching REMIT, market coupling mechanisms, and a system of guarantees of origin, all designed to enhance market efficiency. Wind energy development was also a major topic, emphasising its role in ensuring energy independence and decarbonising Ukraine’s economy while addressing legislative and market challenges.

### XXI INTERNATIONAL ENERGY BUSINESS FORUM “5E”

During 15-17 October 2024, Kyiv hosted the 21st International Energy Business Forum “5E” as part of the “Energy in Industry” and “EcoEnergy Expo” specialised exhibitions. Despite the ongoing wartime challenges, the event gathered government officials, international experts, businesses, NGOs, academic institutions, and local communities to



discuss Ukraine's energy sector restoration and development.

Andriy Konechenkov, Chairman of the UWEA Board, participated in the session "Technical Committee of UNC CIGRE – Developments for Energy System Evolution: Global and Ukrainian Energy Transition During War." In his speech, he outlined challenges and prospects for Ukraine's energy system transformation, highlighting the importance of shifting from a centralised energy model to modern, decentralised generation technologies.

Particular emphasis was placed on the strategic and security advantages of distributed generation development, critical in the context of war and targeted attacks on key energy infrastructure. The dominance of centralised generation, especially



nuclear, in Ukraine's energy system sparked discussions on the growing need for distributed generation to bolster energy security and system resilience.

## 5.3. IMPLEMENTATION OF MARKET-BASED INCENTIVE MECHANISMS FOR RENEWABLES

In 2024, the Association focused on advancing market-based mechanisms for renewable energy (*FiP, corporate PPAs, guarantees of origin, and “green” auctions*) and addressing the accumulation of debt owed to renewable energy producers, both of which are critical for the large-scale development of renewable energy in Ukraine. Participation in numerous national events not only deepened expert discussions but also led to practical solutions for the harmonious development of the energy sector.

### SECOND POST-MEDIATION MEETING OF THE ENERGY COMMUNITY

In 2024, efforts continued within the post-mediation process, initiated by the Energy Community Secretariat back in 2019. Challenges such as damaged energy infrastructure, unresolved market debts, unfulfilled government commitments, and frequent retrospective legislative changes continue to pose additional hurdles for investors and renewable energy enterprises. Moreover, the absence of incentives to transition from the “green” tariff to the market premium mechanism has slowed the integration of new financial instruments and delayed market development.

These pressing issues were the central focus of the second post-mediation meeting held on 09 April 2024, which brought together representatives of the UWEA, its member companies, state-owned enterprises, government bodies, and international organisations. A notable highlight was the Energy

Community Secretariat’s presentation of a study on rebuilding Ukraine’s RE sector. Participants emphasised the importance of maintaining stable sectoral legislation and ensuring guarantees for investors while proposing solutions to pressing issues, including settling energy market debt obligations, implementing corporate PPAs, and introducing other incentives to transition to new support mechanisms.

The meeting reaffirmed the necessity of open dialogue between the state and the business community to address systemic challenges hampering the development of renewable energy in Ukraine. Since its inception in 2020, the post-mediation process has remained a vital tool for finding effective solutions and fostering trust among all market participants.

### CORPORATE PPAs: A WIN-WIN PARTNERSHIP FOR SUSTAINABLE BUSINESS AND ENERGY DEVELOPMENT

On 25 July 2024, an online event titled “Corporate PPAs: A Win-Win Partnership for Sustainable Business and Energy Development” was held, organised by the UN Global Compact in Ukraine in collaboration with EXPRO Electricity and the UWEA as part of the Ukraine Energy Initiative. The event served as a crucial platform for discussing the key aspects of corporate PPAs and their potential to accelerate renewable energy project implementation in Ukraine.

One of the primary topics was the role of corporate PPAs in ensuring a stable RE market by enabling producers to secure predictable long-term income through the sale of “green” electricity. This stability enhances developers’ ability to attract investments during the early stages of projects.

Discussions covered the current status of the corporate PPA market in Ukraine, its legislative and regulatory aspects, and the benefits and challenges these agreements present to both producers and consumers. Particular attention was given to how corporate PPAs can support decarbonisation goals



and the reconstruction of Ukraine's energy system. Participants underscored the need to expand this market to secure a sustainable energy future for the country.

These discussions are instrumental in equipping Ukraine's renewable energy sector with new tools for implementing projects under clearer and more favorable conditions.

### **PANEL DISCUSSION: “THE FIRST “GREEN” AUCTIONS IN UKRAINE: ARE SUPPORT MECHANISMS FOR RE GENERATION WORKING?”**

On 05 December 2024, during an online event organised by the UN Global Compact in Ukraine and EXPRO Electricity, the UWEA representatives reviewed the initial outcomes of the “green” auctions held in fall 2024. The event provided a platform for presenting the business perspective on the government’s approach to auctions and its interaction with market participants.

Discussion focused on key legislative changes designed to facilitate auction participation and improve their effectiveness. One of the main topics was Draft Law No. 11392, which proposes increasing the maximum quota allocation for a single participant from 25% to 50% (*the relevant*



*provision has already been approved in 2025).* Additionally, participants suggested revising quotas to align them with renewable energy development targets outlined in the NREAP to 2030. It was noted that without substantial policy adjustments, investor interest in auctions would remain low. Participants recommended that Ukraine adopt European practices to avoid delays and costly corrections later in the process.

Further discussions included the division of the wind energy quota into two parts for the 2025 auction. Experts also addressed other challenges directly impacting investor interest in auction participation, including war-related risks, the financing of PSO, the lack of payments under the feed-in premium mechanism, and overall trust in the state.

## 5.4. INTERNATIONAL ACTIVITIES

Throughout 2024, the UWEA maintained an active presence on the international stage, participating in key conferences and exhibitions dedicated to renewable energy. These events remain vital platforms for showcasing Ukraine's wind energy sector and discussing its prospects and opportunities with global experts. The Association's consistent engagement in international industry events strengthens partnerships with other countries and expands its network of potential investors, particularly to attract their involvement in the country's post-war recovery.

### WINDEUROPE ANNUAL EVENT 2024

The WindEurope Annual Event 2024, held from 20–22 March in Bilbao, Spain, stood out as a premier European gathering for the wind energy sector. Organized by WindEurope, the event annually brought together industry leaders, policymakers, international financial institutions, investors, and academics. In 2024, the event attracted over 12,000 participants, 520 exhibitors, and 400 speakers. Key topics included strengthening the role of wind energy in enhancing Europe's energy security, creating jobs, addressing climate protection, and promoting local economic growth.

The Ukrainian delegation, led by the UWEA, participated in several high-profile activities, the most notable being the panel discussion “Investing in Ukraine's Wind Energy Sector Today”, which took place on 22 March 2024, coinciding with a massive missile attack by Russia on Ukraine's energy infrastructure.

During the discussion, representatives from leading Ukrainian companies, including DTEK



Renewables, Elementum Energy, and EuroCape Ukraine 1, showcased strategic opportunities within Ukraine's wind market. They also addressed challenges posed by the war, including investment risks and project implementation hurdles under such conditions.

The event underscored that the development of Ukraine's wind energy sector is vital for the energy independence of both Ukraine and Europe. **Each new turbine installed in Ukraine reduces reliance on Russian gas and strengthens Europe's energy security.**

Additionally, the UWEA representatives held numerous meetings with international partners, negotiating new cooperation formats, particularly in attracting international financing for Ukrainian projects.

### GERMAN-UKRAINIAN “GREEN” BUSINESS DIALOGUE

An important milestone in strengthening cooperation between Ukraine and Germany was the German-Ukrainian “Green” Business Dialogue, held on 10 June 2024, in Berlin, Germany, as part of the Ukraine Recovery Conference 2024. This dialogue brought together Ukrainian and German companies alongside government representatives to discuss tools for supporting renewable energy in post-war Ukraine.





Participants examined pressing needs and opportunities within the renewable energy sector, focusing on enhancing Ukraine’s energy system through bilateral cooperation between the two countries. The primary goal of the discussion was to draw policymakers’ attention to the sector’s agenda and advocate for Ukraine’s recovery through renewables and a “green” transition. During the dialogue, German and Ukrainian companies,



alongside their business associations, presented their visions and key requirements for expanding bilateral cooperation.

Andriy Konechenkov, Chairman of the UWEA Board, emphasized the importance of implementing financial mechanisms to ensure the sector’s investment attractiveness. A temporary financial instrument guaranteeing a minimum electricity price was proposed to stabilize investor confidence (*more details in Section 3.3*). These initiatives garnered significant interest among European partners, particularly representatives of IFIs, underscoring the relevance and potential of the proposed solutions.



### PSEW 2024

In June 2024, the UWEA participated in the 19th Conference of the Polish Wind Energy Association held in Świnoujście, West Pomerania. This event brought together over 2,000 participants, including government officials, businesses, and environmental organizations, to discuss the significance of renewable energy and the environmental benefits of transitioning to a low-carbon economy.

The conference served as a platform for exchanging experience between Ukrainian and Polish experts. A key focus was the rapid development of Poland’s wind energy sector, which is projected to reach 18 GW of installed capacity by 2030, positioning wind energy as the second-largest source of electricity after coal. This achievement serves as a valuable model for Ukraine as it advances its own “green” transition and adopts innovative solutions in renewable energy.

### WINDENERGY HAMBURG 2024

Celebrating its 10th anniversary in 2024, WindEnergy Hamburg is rightfully regarded as one of the largest global exhibitions and conferences dedicated to onshore and offshore wind energy. Hosted in Hamburg, Germany, the event brings together industry leaders to discuss contemporary challenges and future prospects. Last year, the exhibition featured over 1,600 exhibitors from 40 countries and attracted more than 40,000 visitors.

The UWEA was presented with its booth under the symbolic slogan “*W(i)ndependence: Freedom Through Energy*”. To showcase the Ukrainian wind energy market, a dedicated digital catalogue was developed, offering comprehensive information about Ukrainian companies, their projects, and the current status of the sector. Representatives of the Ukrainian delegation participated in over 220



sessions focused on the development of wind energy, its role in the global energy system, and innovative solutions to combat climate change.

A notable highlight for Ukraine was the session dedicated to the #Renewables4Ukraine initiative, organized by the WWEA in cooperation with UWEA. The second part of the session, moderated by WWEA Secretary-General Stefan Gsänger, explored the current status of wind energy in Ukraine and its future prospects. Among the speakers were UWEA Board members, executives from Ukrainian companies, and leading industry experts.

UWEA's participation in WindEnergy Hamburg 2024 marked an important step in strengthening ties with international partners and spotlighting the immense potential of Ukraine's wind energy sector. Delegation members held numerous meetings with wind equipment manufacturers, investors, and other stakeholders, exploring future collaboration opportunities. The UWEA booth attracted significant interest from visitors, while the Ukrainian delegation of over 60 participants demonstrated a high level of professionalism and successfully showcased Ukraine on the global stage.



## DECENTRALIZED ENERGY SOLUTIONS FOR UKRAINE'S SECURITY

During 22–29 November 2024, UWEA conducted an official visit to the Netherlands, supported by the Embassy of the Kingdom of the Netherlands in Ukraine and RVO. The program featured meetings with representatives of the local wind energy sector to explore the integration of refurbished wind turbines and their adaptation to modern standards.

The delegation also attended the international conference “Decentralized Energy Solutions for Ukraine's Security” on 25 November in the Hague. Organized by the Ukraine Facility Platform and Open Door Ukraine, the event brought together renewable energy professionals, investors, business leaders, and policymakers to explore ways to rebuild Ukraine's energy infrastructure. Discussions centered on implementing decentralized systems combining wind, solar, bioenergy, and energy storage technologies.

During the conference's opening, Lana Zerkal, Ambassador Extraordinary and Plenipotentiary and Deputy Minister of Foreign Affairs (2014–2019), highlighted Ukraine's need for a new *modus operandi* in its energy system. She advocated decentralized renewable energy systems as a sustainable strategy for Ukraine's energy security that aligns with climate goals and reinforces Europe's strategic autonomy.

Erica Schouten, Special Envoy for Ukraine at the Dutch Ministry of Foreign Affairs, emphasized two urgent needs: air defense systems and a more decentralized, sustainable national energy system. She reiterated the Dutch government's readiness to support Ukraine through financial and insurance tools for renewables development.

Andriy Konechenkov, Chairman of the UWEA Board, stressed the importance of unified goals for renewable energy development in Ukraine. He advocated **granting wind energy projects a status of overriding public interest**, creating a balanced regulatory environment, and ensuring state support to attract investments.

## 5.5. COOPERATION WITH COMMUNITIES

Thanks to the decentralization reform launched in 2014, communities have gained greater autonomy in implementing their policies and projects. In 2024, the UWEA continued its active efforts to create favorable conditions for the development of decentralized energy generation, fostering effective communication with communities particularly through educational programs, forums, and workshops. These initiatives not only drive the growth of wind energy but also contribute to the sustainable development of regions, strengthening Ukraine's energy independence and security.

### EDUCATIONAL LESSONS IN SCHOOLS

Raising awareness among the younger generation is a crucial step toward advancing “green” energy in Ukraine. Children are the architects of Ukraine's future – a future that must be clean, sustainable, and eco-friendly. Working with communities that are potential stakeholders in wind and solar power



projects should be a top priority for the government and investors seeking to advance projects that contribute to Ukraine's energy independence and security.

As part of its outreach efforts, the UWEA representatives visited schools in the Svalyava and Volovets communities in Zakarpattia on 13–14 May 2024, delivering interactive guest lectures on wind energy. During these sessions, students learned how wind turbines operate and convert wind into electricity, the historical use of wind energy, the environmental and economic advantages of wind energy, the distinctions between renewable energy sources and fossil fuels, and the realities of climate change.

Such educational events are a vital component of community engagement and must occur at every project stage. Open dialogue and accurate information about wind energy technology can foster understanding and promote the growth of “green” energy, which is critically needed in Ukraine.



## **FORUM: “DECENTRALISED GENERATION. NEW OPPORTUNITIES FOR BUSINESSES AND COMMUNITIES”**

On 05 August 2024, Ukraine hosted the significant forum – “Decentralised Generation. New Opportunities for Businesses and Communities” – organised by the NPC Ukrenergo. The event brought together government officials, businesses, industry associations, and NGOs, demonstrating widespread interest in developing decentralised generation and the urgent need for new investments in Ukraine’s renewable energy sector.

One key highlight of the forum was NPC Ukrenergo’s announcement regarding the first auctions for the procurement of ancillary services to balance the energy system – an essential step in rebuilding energy infrastructure damaged by Russian attacks. These auctions will welcome projects in distributed generation, including wind, solar, biomass power plants, and energy storage systems.

The forum underscored its strategic importance for Ukraine’s energy security, introducing mechanisms that could offer private investors financial stability and transparency in the renewable energy market. A conducive regulatory environment was emphasised as crucial for attracting investments necessary to achieve ambitious plans for expanding renewable generation capacities.

Taking the opportunity, the UWEA representatives once again emphasized the critical importance of actively engaging communities in the implementation of new projects. This issue has taken on new significance, as the implementation of RE projects sometimes faces resistance at the local level. The UWEA highlighted the role of communication and educational efforts in overcoming such barriers. Overall, the forum marked a pivotal milestone in Ukraine’s energy policy development, laying the groundwork for advancing distributed generation and ensuring the stability of the national energy system.

## **WORKSHOP: “PARTNERSHIP FOR UKRAINE’S SUSTAINABLE RECOVERY”**

Recognising the importance of community engagement and public participation in accelerating renewable energy deployment, the UWEA participated in the workshop “Partnership for Ukraine’s Sustainable Recovery,” held on 05 December 2024, in Stryi, Lviv region. This event convened representatives from communities across Ukraine, serving as a vital platform for sharing experience and addressing key issues related to wind energy project development.

One of the primary objectives of the discussion was to familiarize the public with the process of implementing wind energy projects. During his presentation, Yevhenii Kontorshchikov, an analyst from the UWEA Secretariat, presented Ukraine’s wind energy prospects and the challenges facing the sector. He emphasised the country’s vast resource potential for building new wind capacities, which could enhance energy security and reduce dependency on energy imports. Key topics included legislative barriers, grid connection difficulties, and the substantial financial investments required for such projects.

In this context, the importance of close collaboration between government authorities, investors, and local communities was emphasized as essential for effectively and jointly overcoming existing challenges in the national interest. As part of the event, participants visited the Skolivska WPP, which stands as a vivid and successful example of such cooperation, even amidst the challenges of a full-scale war.

## 5.6. UWEA WEBINAR SERIES 2024

In 2024, the UWEA continued its series of webinars, launched back in 2021. Each webinar focused on key aspects of implementing wind energy projects, including grid connection, legal, financial, and technical innovations in the development of hybrid energy systems, the process of obtaining aviation permits, and other critical topics.

### GRID CONNECTION OF WIND ENERGY PROJECTS

On 20 February 2024, a webinar delved into the complexities of connecting wind energy projects to electrical grids. Representatives from UWEA member companies, including IKNET Energy Engineering and LCF Law Group, engaged in in-depth discussions on grid reliability challenges. The event placed a strong focus on electrical regime calculations – an essential element for successfully integrating wind energy projects and energy storage systems into Ukraine’s IPS.

Yurii Podoliak, CEO of IKNET Energy Engineering, shared practical case studies on optimizing wind farm operations. Oleksandr Zhygalyuk, Head of the Transmission System Development Department at NPC Ukrenergo, presented detailed plans for grid modernisation and expansion using advanced technologies for renewable energy integration. The webinar was moderated by Andriy Konechenkov, Chairman of the UWEA Board, who underscored the importance of collaboration between businesses and the TSO for successful project implementation.

### 10 FREQUENTLY ASKED QUESTIONS ABOUT OPERATING IN THE FREE MARKET

On 12 March 2024, the UWEA organised a webinar on independent operations of renewable energy producers in the free electricity market. Speakers included representatives from JSC Energy Company of Ukraine and CMS Cameron McKenna Nabarro Olswang. Discussions covered new opportunities for producers, such as the potential benefits of leaving the Guaranteed Buyer balancing group.

Illia Prytula, Head of Green Energy at JSC Energy Company of Ukraine, highlighted the importance of partnering with professional traders to optimize operations in the free market and shared success stories of signing pre-PPA contracts that secure financing during early project stages. Vitaliy Radchenko, Managing Partner at CMS Cameron

McKenna Nabarro Olswang, focused on legal aspects, including long-term agreements and trading guarantees of origin certificates. He emphasized that new mechanisms like FiP create additional opportunities for wind and solar power projects, allowing state support even in the free market.

### INTEGRATION OF RENEWABLES INTO UKRAINE’S UNIFIED ENERGY SYSTEM

On 17 April 2024, a webinar focused on the technical aspects of integrating wind power plants into Ukraine’s unified energy system. Experts from various UWEA member companies such as DMCC Engineering and INTEGRITES shared their experiences with grid connection procedures, including technical calculations, and discussed improvements to the regulatory framework. The issue is particularly relevant under martial law, as integration processes are complicated by infrastructure damage and the need to comply with international standards.

### RECLAIMING THE WIND: LEGAL STRATEGIES FOR RECOVERING WAR LOSSES

On 30 April 2024, the UWEA hosted the webinar “Reclaiming the Wind: Legal Strategies for Recovering War Losses.” According to Maria Kostytska, partner and head of the arbitration practice at Winston & Strawn LLP one of the available options for investors to recover losses incurred due to the full-scale war is filing claims to seek damages from the Russian Federation under the 1998 Agreement between Ukraine and Russia on the Promotion and Mutual Protection of Investments. During the webinar, it was also noted that potential claimants could rely on favorable precedents set by previous investment arbitration cases related to the annexation of Crimea, commonly referred to as the “Crimean cases,” as well as the European Court of Human Rights’ decision in Ukraine and the Netherlands v. Russia on 25 January, 2023.

The webinar focused heavily on the current legal framework for pursuing claims against Russia and the specifics of filing such claims, including the rights and violations that may be considered in arbitration, the duration and costs of such proceedings, and the potential for filing mass claims. This comprehensive analysis aimed to provide investors with actionable insights into the process and opportunities for recovery.

## LEGAL AND TECHNICAL ASPECTS OF BUILDING HYBRID SYSTEMS

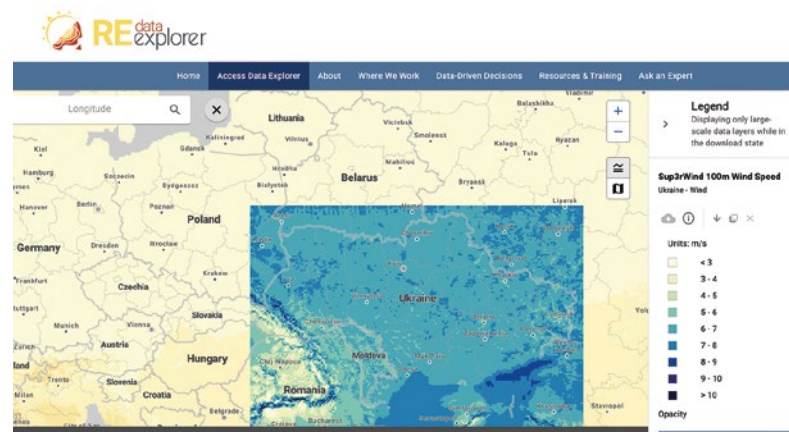
On 29 May 2024, a webinar was held to address the construction of hybrid power plants combining various types of renewable energy generation. Participants discussed both the technical and legal aspects of implementing such projects. Industry representatives shared examples of international experience, particularly from Turkey, and highlighted the advantages of hybrid power plants in enhancing the stability of energy systems.

## PRESENTATION OF THE WIND ENERGY ATLAS

On 18 June 2024, the UWEA, in collaboration with its partners NREL and USAID, officially unveiled data on Ukraine's wind and solar potential, now publicly available on the RE Data Explorer platform – a user-friendly web tool for geospatial analysis and visualization of renewable energy potential, customizable for various scenarios. The event gathered Ukrainian and international renewable energy developers, investors, industry researchers, and other stakeholders, who gained exclusive insights on leveraging RE Data Explorer to optimize their energy strategies and support sustainable development goals.

Special emphasis was placed on the tool's ability to facilitate realistic and well-informed planning for the development of renewable energy in Ukraine. The availability of accurate data on the wind and solar potential of each region enables the creation of objective energy transition strategies, efficient siting of renewable energy facilities, and support for developers in identifying the most promising locations for their projects.

Access to such data also empowers investors to form realistic expectations about the clean energy production levels in specific regions, enhancing transparency and making investments in the renewable energy sector more attractive and reliable.



## OBTAINING AVIATION PERMITS FOR WIND FARMS IN AERODROME AREAS

One of the key stages in the development of a wind energy project is obtaining aviation permits for the height of wind turbines. This step ensures that turbine operations do not compromise flight safety or interfere with the functionality of civil aviation radio equipment, particularly when the construction site is located in aerodrome-adjacent territories, where specific regulations govern the approval process. Given the relevance of obtaining aviation clearances for some wind energy projects near these areas, and to provide stakeholders with practical insights into the procedure, UWEA organized a dedicated webinar on 18 July, 2024. During the event, experts from the law firm Asters, NOTUS Energy, and a representative of the Department of Spatial Planning and Architecture of the Ministry for Communities and Territories Development of Ukraine examined practical aspects of obtaining aviation permits, including regulatory simplifications introduced in 2022 and the new requirements for submitting geographical data in the WGS-84 system.

## 5.7. EXPANSION OF PARTNERSHIPS

Throughout 2024, the UWEA actively focused on establishing new partnerships and strengthening existing ones. Only through collaboration and partnership Ukraine's wind energy sector can achieve the ambitious goals outlined in various national strategies and plans. The UWEA continues to engage international organizations, national industry associations, expert centres, and institutes, uniting efforts to foster the sustainable development of renewable energy in Ukraine.

### COLLABORATION WITH BWE

In 2023, during the Berlin Energy Dialogue, a Memorandum of Cooperation was signed between the UWEA and the BWE. This agreement marked a significant step toward strengthening Ukrainian-German partnership and fostering the development of wind energy in Ukraine.

As part of this collaboration, on 29 February 2024, associations held their first joint international webinar titled "The Wind Energy Market of Ukraine." The event provided valuable insights into the current market status, recent and anticipated legislative developments, existing market advantages, and opportunities. It also highlighted the role of German businesses in developing Ukraine's wind energy sector, showcasing examples from UWEA member companies.

Special attention was given to the potential for offshore wind energy development in the Black Sea and Azov Sea basins, opening new horizons for advancing Ukraine's energy sector.

### IMPLEMENTING THE MEMORANDUM WITH RENEWABLEUK

Under the Memorandum of Cooperation, signed on 22 June 2023, between the UWEA and RenewableUK, Ukrainian representatives played an active role in numerous high-profile industry events focused on the UK's renewable energy sector. Their engagement and exchange of expertise significantly enhanced understanding of both the technical and legislative frameworks essential for advancing wind energy projects.

As part of this partnership, on 18 April 2024, Yaroslav Petrov, Partner at the law firm Asters and Co-Chair of UWEA's Legal Affairs Committee, participated in the UK Green Hydrogen Forum, a key event dedicated to integrating hydrogen technologies into wind energy. The forum's central theme was the outcomes of the first round of the Hydrogen Acceleration Round (*HAR1*), a government program aimed at supporting hydrogen project development.

Subsequently, on 09 May 2024, in Europe Day, the UWEA and RenewableUK jointly hosted an international webinar focusing on the development of wind energy in Ukraine and the United Kingdom, as well as the investment opportunities within the Ukrainian market. The event covered onshore and offshore projects, emphasizing the need for energy infrastructure expansion, streamlining grid connection procedures, and advancing energy storage solutions. It featured participants from industry associations, UK government representatives, and developers active in the Ukrainian market.

Later, on 18-19 June 2024, the UWEA representative participated in the Global Offshore Wind Conference, which gathered over 2,000 participants from around the world. This conference served as a pivotal forum for the offshore wind energy sector and highlighted its global significance.

### MEMORANDUM WITH THE GENERAL ENERGY INSTITUTE OF THE NAS OF UKRAINE

On 23 October 2024, the UWEA signed a Memorandum of Cooperation with the General Energy Institute of the NAS of Ukraine. The signatories reaffirmed their commitment to jointly advancing the efficient and balanced development of Ukraine's energy complex, its





“green” transformation, and post-war recovery. Such collaboration between the academic community and the industry association represents a crucial step toward achieving synergy between scientific research and the practical implementation of wind energy projects in Ukraine. The partnership between the UWEA and the General Energy Institute of the NAS of Ukraine will play a key role in strengthening Ukraine’s energy independence through the adoption of advanced technologies and innovative research developments.

Konechenkov (Ukraine) and Jan Vos (Netherlands). This agreement paves the way for collaboration in introducing cutting-edge technologies, which will contribute to Ukraine’s energy infrastructure development and enhance its energy independence.

#### MEMORANDUM WITH NEDZERO

The formal signing of the Memorandum on Cooperation between NedZero and the UWEA in November 2024, marked a pivotal milestone in forging a strong alliance between Dutch and Ukrainian wind energy industries, laying the foundation for deeper collaboration and mutual growth. The document was signed by Heads of the national associations, Andriy



**Andriy Konechenkov,**  
Chairman of the  
UWEA Board



*“I would like to express my gratitude to NedZero and the Dutch people for their dedication and partnership. This collaboration symbolizes the strong synergy between Ukraine and the Netherlands – two nations united by a shared goal of harnessing clean, renewable energy for a sustainable, green, and secure future.”*



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## 5.8. VOLUNTEER ACTIVITIES



In the face of the current energy crisis and recovery from wartime destruction, the use of RES has become critically important for ensuring the sustainable development of communities. Innovative energy solutions not only reduce dependence on traditional resources but also enhance energy security and autonomy for critical infrastructure facilities. In response to the challenges posed by Russia's full-scale invasion, the UWEA continues to engage in charitable activities, supporting communities most affected by the war. With the support of partners such as WWEA and the Finnish non-profit organization EKOenergy, the UWEA has implemented several projects aimed at providing social infrastructure facilities with energy independence. The #Renewables4Ukraine initiative, launched in 2022, stands as a vivid example of how RES can play a key role in Ukraine's recovery and sustainable development.

One of the key steps within this initiative was equipping the "Dzhereltse" kindergarten of the "Osvita" Gymnasium in Irpin, Kyiv region, with a 10 kW solar system. Back in December 2022, with the support of EKOenergy, the local community received mobile solar stations, marking the beginning of a broader energy support program. These stations provided electricity to critical infrastructure during blackouts, proving their effectiveness even in the most challenging conditions.

On 18 April 2024, Galyna Shmidt, the UWEA Board member, signed a trilateral Memorandum of Cooperation with the Borodianka Settlement Council and the charitable organization Vidvazhnykh. Under this MoU, the Pinocchio kindergarten in Borodianka, Kyiv region – heavily damaged during the war – received an 11 kW solar power plant.



**Stefan Gsänger,**  
WWEA Secretary  
General



*“We feel immense satisfaction and joy in once again ensuring stable electricity supply for kindergarten children. The significance of this event goes far beyond an individual project – it demonstrates the foundations on which a better, more peaceful, and prosperous world can be built. We are deeply grateful to everyone who made this solar installation possible.”*

The project is unique in its ability to store energy, ensuring uninterrupted power supply even during evening hours. The installed system also features remote monitoring, simplifying maintenance and operation.

Thanks to the support of EKOenergy and WWEA, another important project was launched in 2024, involving the installation of two solar power plants: a 15.66 kW system at the “Kazka” kindergarten in the previously mentioned Borodyanka and a

10.4 kW system at the “Svitlyachok” kindergarten in Myrhorod. The project aimed not only to provide energy autonomy for the kindergartens but also to reduce electricity costs, allowing the savings to be reinvested in other community needs. *(Both systems were commissioned in early February 2025.)*

The #Renewables4Ukraine program has also supported other social infrastructure facilities, including the Irpin Lyceum of Innovative Technologies (ILIT) and the Kozynets Family Medicine Clinic. The mobile solar systems provided under the program have proven to be reliable sources of electricity during crises, ensuring the uninterrupted operation of medical and educational institutions.

RES has already become a cornerstone of enhancing energy autonomy and resilience in Ukrainian communities. The UWEA’s charitable efforts in 2024 have made a significant contribution to the recovery of war-affected communities. Through partnerships with WWEA, EKOenergy, and other organizations, the UWEA continues to expand the program, fostering sustainable development and energy independence for Ukraine. The successful outcomes of these projects demonstrate that even in the most challenging circumstances, it is possible to create new opportunities for the future.



# ABBREVIATIONS AND ACRONYMS

<b>AIB</b>	Association of Issuing Bodies	<b>ESS</b>	Energy Storage System
<b>ACER</b>	Agency for the Cooperation of Energy Regulators	<b>EU</b>	European Union
<b>API</b>	Application Programming Interface	<b>EUI</b>	Economist Intelligence Unit
<b>BASOFWED</b>	Black Sea Offshore Wind Energy Federation	<b>EXPRO</b>	Exploration & Production Consulting
<b>BioPP</b>	Bioenergy Power Plant	<b>FiP</b>	Feed-in Premium
<b>BWE</b>	German Wind Energy Association ( <i>Bundesverband WindEnergie e.V.</i> )	<b>FIT</b>	Feed-in Tariff
<b>CAPEX</b>	Capital Expenditure	<b>FIDIC</b>	International Federation of Consulting Engineers
<b>CBAM</b>	Carbon Border Adjustment Mechanism	<b>GE</b>	General Electric
<b>CfD</b>	Contracts for Difference	<b>GO</b>	Guarantee of Origin
<b>CHP</b>	Combined Heat and Power Plant	<b>GW</b>	Gigawatt
<b>CMU</b>	Cabinet of Ministers of Ukraine	<b>GWEC</b>	Global Wind Energy Council
<b>CO<sub>2</sub></b>	Carbon Dioxide	<b>HPP</b>	Hydropower Plant
<b>COP</b>	Conference of the Parties to the UNFCCC	<b>HSE</b>	Health, Safety, and Environment
<b>DAM</b>	Day-Ahead Market	<b>IEA</b>	International Energy Agency
<b>DSA</b>	Development Service Agreement	<b>IFC</b>	International Finance Corporation
<b>DSC</b>	Distribution System Code	<b>IFI</b>	International Financial Institutions
<b>DSO</b>	Distribution System Operator	<b>IDM</b>	Intraday Market
<b>DFC</b>	Development Finance Corporation	<b>IPS</b>	Integrated Power System
<b>DTU</b>	Technical University of Denmark	<b>IRENA</b>	International Renewable Energy Agency
<b>EBRD</b>	European Bank for Reconstruction and Development	<b>IT</b>	Information Technology
<b>EC</b>	European Commission	<b>JDA</b>	Joint Development Agreement
<b>ENTSO-E</b>	European Network of Transmission System Operators for Electricity	<b>JSC</b>	Joint Stock Company
<b>EPC</b>	Engineering, Procurement and Construction	<b>KSE</b>	Kyiv School of Economics
<b>ESG</b>	Environmental, Social, and Governance Criteria	<b>kV</b>	Kilovolt
		<b>kW</b>	Kilowatt
		<b>kWh</b>	Kilowatt-hour
		<b>LCOE</b>	Levelized Cost of Energy

LLC	Limited Liability Company	SIC	Standard Industrial Classification
M&A	Mergers and Acquisitions	SPP	Solar Power Plant
MC	Management Company	SPV	Special-purpose entity / special-purpose vehicle
MW	Megawatt	TC	Technical Conditions
MWh	Megawatt-hour	TOE	Tonnes of Oil Equivalent
MRGP	Minimum Required Guaranteed Price	TPP	Thermal Power Plant
NAS	National Academy of Sciences	TSC	Transmission System Code
NBU	National Bank of Ukraine	TSO	Transmission System Operator
NPP	Nuclear Power Plant	TW	Terawatt
NECP	National Energy and Climate Plan	TWh	Terawatt-hour
NEF	New Energy Finance ( <i>BloombergNEF</i> )	UAE	United Arab Emirates
NEURC	National Energy and Utilities Regulatory Commission	UAV	Unmanned Aerial Vehicle
NGO	Non-Governmental Organization	UBA	Ukrainian Bar Association
NNEGC	National Nuclear Energy Generating Company	UCGFEA	Ukrainian Classification of Goods for Foreign Economic Activity
NPC	National Power Company	UK	United Kingdom
NREAP	National Renewable Energy Action Plan	UNC CIGRE	Ukrainian National Committee of the International Council on Large Electric Systems
NREL	National Renewable Energy Laboratory	UN	United Nations
NSDC	National Security and Defense Council of Ukraine	URC	Ukraine Recovery Conference
O&M	Operations and Maintenance	USA	United States of America
PJSC	Private Joint-Stock Company	USAID	United States Agency for International Development
PPA	Power Purchase Agreement	UWEA	Ukrainian Wind Energy Association
PSPP	Pumped Storage Power Plant	VAT	Value Added Tax
PSO	Public Service Obligation	WindEurope	European Wind Energy Association
PU	Public Union	WPP	Wind Power Plant
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency	WWEA	World Wind Energy Association
RenewableUK	Renewable Energy Association of the United Kingdom	WTG	Wind Turbine Generator
RES	Renewable Energy Sources		
RVO	Netherlands Enterprise Agency		
SE	State Enterprise		

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# LEGISLATION FOSTERING WIND ENERGY DEVELOPMENT IN UKRAINE

was initiated to assess the current regulatory framework governing the electricity and renewable energy markets in Ukraine, and wind energy in particular, and to draft a comprehensive legislative and regulatory roadmap necessary for adoption in the medium term to preserve and fully utilize the current potential of wind energy in Ukraine.



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