10 YEARS 2008-2018

UWEA UKRAINIAN WIND ENERGY ASSOCIATION

UKRAINIAN WIND POWER SECTOR

2017

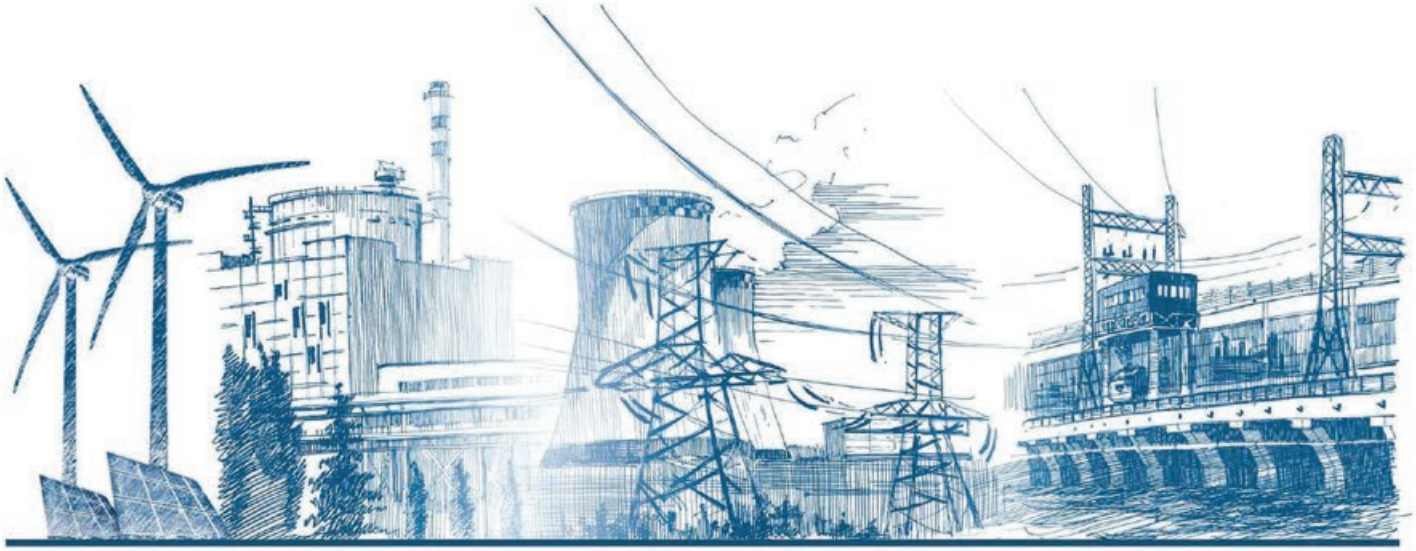
ВСЕУКРАЇНСЬКА ЕНЕРГЕТИЧНА АСАМБЛЕЯ

НОРМАТИВНЕ ТА ТЕХНІЧНЕ ЗАБЕЗПЕЧЕННЯ ЕНЕРГЕТИЧНОЇ ГАЛУЗІ

Під загальною редакцією к.т.н. І. В. ПЛАЧКОВА
та А. Є. КОНЕЧЕНКОВА

ВІДНОВЛЮВАНА ЕНЕРГЕТИКА
ВІТРОВІ ЕЛЕКТРОСТАНЦІЇ

ОРГАНІЗАЦІЯ ЕКСПЛУАТАЦІЇ ТА ТЕХНІЧНОГО ОБСЛУГОВУВАННЯ. НОРМИ ТА ВИМОГИ



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СТАНДАРТ ОРГАНІЗАЦІЙ УКРАЇНИ

FOLIO

UKRAINIAN WIND POWER SECTOR 2017

MARKET OVERVIEW

Ukrainian Wind Market Overview 2017 has been prepared by Public Union UKRAINIAN WIND ENERGY ASSOCIATION *(UWEA)* in cooperation with **SAYENKO KHARENKO Law Firm.**

The reported statistics is based on official information published by the State Agency on Energy Efficiency and Energy Saving of Ukraine, the Ministry of Energy and Coal Industry of Ukraine, the National Energy and Utilities Regulatory Commission of Ukraine, State Enterprise "Energorynok", State Enterprise "National Energy Company "Ukrenergo", as well as the UWEA member companies' information and information provided by Ukrainian Wind Energy Agency LLC.

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Public Union "UKRAINIAN WIND ENERGY ASSOCIATION" *(UWEA)* is a non-profit organisation aimed at promoting wind energy technologies and ensuring wind energy industry's interests on the national and international levels.

The UWEA brings together wind power project developers, wind power equipment manufacturers and suppliers, utilities, construction companies, scientists and researchers, lawyers, NGOs, consumers and others involved in the wind industry – one of the world's fastest growing energy industries.

The Ukrainian Wind Energy Association cooperates with various national, regional and local authorities. The UWEA contributes greatly to information and experience exchange with all stakeholders.

The UWEA is a member of the World Wind Energy Association and the European association WindEurope.

SAYENKO KHARENKO enjoys global reputation as a leading Ukrainian law firm with an internationally oriented full-service practice. Currently Sayenko Kharenko is one of the largest law firms in Ukraine. The firm specialises in complex cross-border and local transactions and enjoys a reputation for delivering sophisticated legal solutions in all areas of law, including:

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- Bankruptcy and Debt Restructuring
- Capital Markets
- Corporate and M&A
- Corporate Security
- Criminal Defense
- Government Relations *(GR)*
- International Arbitration
- International Trade
- Labor and Compliance
- Litigation
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- Private Wealth Management
- Real Estate
- Tax

Sayenko Kharenko has introduced multiple new products in Ukraine and has contributed significantly to the development of multiple markets and industries. The firm's clients especially value its practical and innovative approach and its ability to comprehend their needs and help achieve their strategic and business goals.

This has helped Sayenko Kharenko become the preferred legal counsel for largest multinational corporations, banks and other financial institutions, Fortune 500 companies, industrial groups, international public organisations, and individual business owners.

CONTENT

ACRONYMS AND ABBREVIATIONS

AIES	Aggregate Initial Energy Suppliers
ATO	Anti-Terrorist Operation in Ukraine
BioPP	Biomass Power Plant
CC	Complexity Category
CHP	Combined Heat and Power
CMU	Cabinet of Ministers of Ukraine
EIA	Environmental Impact Assessment
ENTSO-E	European Network of Transmission System Operators for Electricity
ESCO	Energy Service Company
HPP	Hydro Power Plant
IRENA	International Renewable Energy Agency
MP	Member of Parliament
NEC	National Energy Company
NEURC	National Energy and Utilities Regulatory Commission of Ukraine
NGO	Non Governmental Organisation
NPP	Nuclear Power Plant
PPA	Power Purchase Agreement
PSH	Pumped Storage Hydroelectric Power Plant
PU	Public Union
PV	Photovoltaic
RE	Renewable Energy
RES	Renewable Energy Source
SAEE	State Agency on Energy Efficiency and Energy Saving of Ukraine
SE	State Enterprise
SHPP	Small Hydro Power Plant
SPP	Solar Power Plant
toe	tonne of oil equivalent
TPP	Thermal Power Plant
WWEA	World Wind Energy Association
WPP	Wind Power Plant

I. WIND POWER SECTOR OF UKRAINE

1.1. KEY FIGURES AND FACTS

It would be fair to call 2017 the year when the "green" sector of the electric power industry of Ukraine recovered from stagnation. After two years during which international financial institutions were not active in financing new renewable energy projects, 2017 has become quite successful, giving hope that new and more powerful renewable energy projects will be implemented within the next 2-3 years.

Figure 1.1.1. *Dynamics of wind energy development in Ukraine and the Crimean peninsula, 2009-2017*

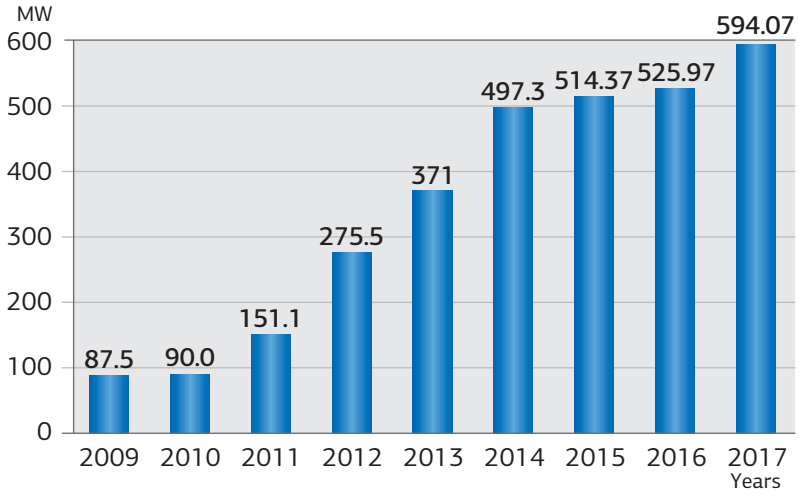
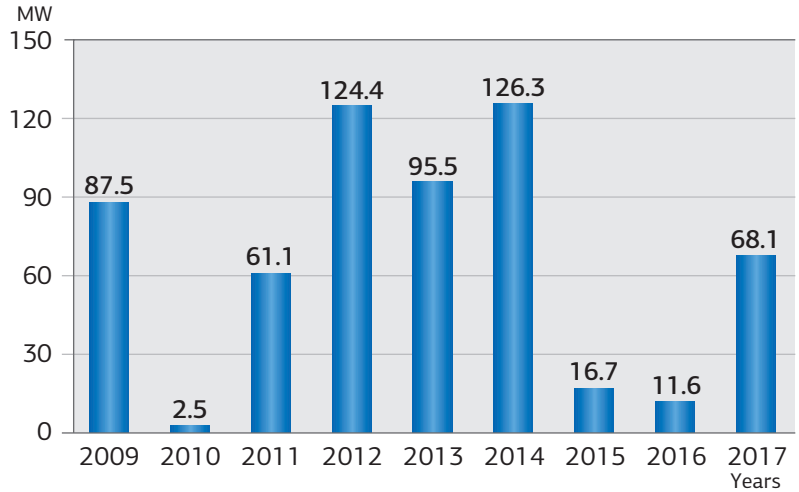


Figure 1.1.2. *Annual wind power capacity additions, by years*



The active position in financing the renewable energy projects taken by PJSC UKRGASBANK, EBRD, IFC, NEFCO, IFU and other financial institutions, as well as interest in Ukraine on the part of the American Overseas Private Investment Corporation *(OPIC)* have significantly improved the investment climate in Ukraine.

The new laws "On the electricity market" and "On environmental impact assessment" adopted by the Ukrainian Parliament have also played a positive role in this process.

As of the end of 2017, the total installed wind capacity in Ukraine increased to **594.07 MW,** including **506.26 MW** on the mainland of Ukraine *(138 MW in the territory occupied by the Russian Federation in the Luhansk and Donetsk Regions).* The installed capacity of WPPs in the Crimea has not changed and is the same as in 2013 – 87.8 MW.

At the end of 2017, 273.83 MW of the wind power facilities supplied electricity to the United Energy System of Ukraine under the feed-in *("green")* tariff. Due to the absence of a quorum at the NEURC meetings held in November and December 2017, 44.4 MW of the wind power facilities received a "green" tariff only in the first decade of January 2018. According to a survey conducted by the UWEA, in 2017, WPPs located on the mainland delivered **970.496 million kWh** of electricity to the grid. The supply of electricity by the solar and wind power plants located in the annexed territory of the Autonomous Republic of Crimea to the United Energy System of Ukraine has been suspended since April 2014.

In 2017, "green" electricity generated from wind saved more than **736.500 tons** of CO_2 emissions. Wind power plants produced enough electricity for about **207.000** typical Ukrainian households with an average consumption of 400 kWh per month.

Wind energy that gradually displaces the electricity generated by fossil fuels reduces CO_2 emissions and helps to avoid the cost of buying these fuels. In 2017, wind energy avoided about **340.780 toe of fossil fuel imports or 454.374 tons of coal.**

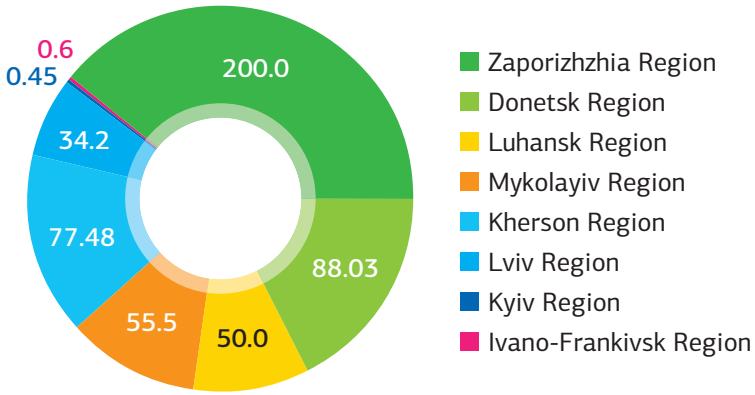
The national wind energy sector provides money to the state and local budgets in the form of taxes, fees, etc., thus contributing to the country's economic development. In particular, only wind energy companies, which now operate wind power plants in Ukraine, namely the operating company DTEK RES *(its wind power plants),* Management Company "Wind Parks of Ukraine", the Vindkraft Group of Companies, and Eco-Optima LLC transferred almost **UAH 1.184 billion** to the budget. This figure does not include the funds transferred to the state budget by wind energy companies, which are currently developing their wind power projects.

In 2017, **296 specialists** were directly employed in the wind power companies in Ukraine. At the same time, according to the survey's results, women account for 20% of the total employment in the wind energy sector. In addition to creating jobs in wind energy equipment manufacturing and electricity production, **wind energy creates jobs** in many other industries and economic sectors across the country. The total of individuals involved, directly or indirectly *(machine-building complex, engineering and design, transport, law firms, etc.),* in the country's wind energy sector is estimated at **900 persons.**

A good example of job creation by the wind power in other industries is the involvement of Ukrainian factories in manufacturing various components for a wind turbine produced by Fuhrländer Windtechnology LLC *(for more details please see section "Turbines manufactured in Ukraine").*

In terms of the installed capacity, Zaporizhzhia Region, where one of Europe's largest plants, the Botiyevska Wind Power Plant owned by DTEK RES is located, maintains the leading position. The company has been implementing some other energy projects in Zaporizhzhia Region. In 2017, the wind power capacities also increased in the Kherson, Mykolayiv and Lviv Regions. The first wind turbine was installed in Ivano-Frankivsk Region.

Figure 1.1.3. *Distribution of wind power facilities, by regions of mainland Ukraine, MW, 2017*



1.2. FUEL AND ENERGY COMPLEX OF UKRAINE IN 2017

The total installed capacity of electric power plants of the United Energy System of Ukraine at the end of 2017 *(without the power generating facilities of the Crimean Electric Energy System)* is 55.7 GW: thermal power plants *(TPPs, CHPs, isolated generating plants)* account for 62.3%; nuclear power plants – 24.8%; hydro power plants and pumped storage hydroelectric power plants –11.2%; RE power plants (wind power plants, solar power plants and bio power plants) – 1.7%.

The main generating facilities of the United Energy System of Ukraine include:

- 4 nuclear power plants *(15 power units, including 13 power units with a unit capacity of 1 000 MW, 1 power unit with a unit capacity of 415 MW, and 1 power unit with a unit capacity of 420 MW);*
- cascades of 7 hydro power plants on the Dnipro River and the Dniester River with a total of 94 hydro units, and 3 pumped storage plants *(11 hydro units with a unit capacity ranging from 37 MW to 324 MW);*
- 12 TPP generating companies with 83 power units, each with a capacity of 150, 200, 300 or 800 MW *(150 MW – 6 units, 200 MW – 32 units, 300 MW – 38 units, 800 MW – 7 units),* and 4 turbogenerators;
- 3 large CHPs *(Kyiv CHPs-5 and 6 and Kharkiv CHP-5)* with 9 power units, each with a capacity of 100 *(110)* MW *(4 units)* and 250 MW *(5 units)*[1].
- 14 TPP generating companies with 97 power units, each with a capacity of 150, 200, 300, 800 MW *(150 MW – 6 units, 200 MW – 42 units, 300 MW – 42 units, 800 MW – 7 units)* and 4 turbogenerators.

According to the preliminary data, from January to December 2017, the total of electricity generated by Ukrainian power plants of the United Energy System of Ukraine was 155 414.4 million kWh, which is 0.4% more than during 12 months of 2016. Thermal power plants of power generating companies generated 44 960.1 million kWh, which is 11.0% less than during 12 months of 2016. The aggregate of electricity generated by heat and power plants and cogeneration plants is estimated at 10 881.5 million kWh, which is 6.7% less than during the same period in 2016. Nuclear power plants generated 85 576.2 million kWh, which is 5.4% more than during the same period in 2016. For 12 months of 2017, hydro power plants and pumped storage hydroelectric power plants generated 10 567.3 million kWh, which is 13.7% more than during 12 months of 2016.

[1] *Territories not controlled by Ukraine in the Donetsk and Luhansk Regions inclusive.*

Table 1.2.1. *Installed capacity of electric power plants, by years, GW*

YEAR	Cumulative Installed Capacity	NPPs	%	TPPs	%	TPPs and CHPs	%	HPPs and PSHs	%	WPPs, SPPs and BioPPs	%
2014	55.1	13.8	25.1	27.7	50.3	6.6	12.0	5.9	10.6	1.1	2.0
2015	54.8	13.8	25.2	27.8	50.7	6.5	11.8	5.9	10.7	0.8	1.5
2016	55.3	13.8	25.0	27.8	50.3	6.5	11.8	6.2	11.2	1.0	1.7
2017*	51,8	13.8	26.7	24.6	47.5	6.0	11.5	6.2	11.2	1.2	2.3
2017**	55.7	13.8	24.8	27.9	50.0	6.5	11.6	6.2	11.2	1.3	2.4

** Excluding statistics for the territories not controlled by Ukraine in the Donetsk and Luhansk Regions.*
*** Including statistics for the territories not controlled by Ukraine in the Donetsk and Luhansk Regions.*

The total of electricity generation by isolated generating plants and other sources during 12 months of 2017 was 1 532.9 million kWh, which is 1.8% less than during the same period in 2016. Electricity generation by RE sources *(WPPs, SPPs and BioPPs)* during 12 months of 2017 reached 2 086.3 million kWh, which is 14.9% more than during the same period in 2016. Chart 1.2.2 presents electricity generation by types of generating facilities.

According to the data of the Ministry of Energy and Coal Industry of Ukraine, in 2017, Ukraine increased electricity exports by 28.6% *(by 1 billion 149.5 million kWh)* against 2016.

Chart 1.2.2. *Share of generating facilities in electricity production in Ukraine, 2017*

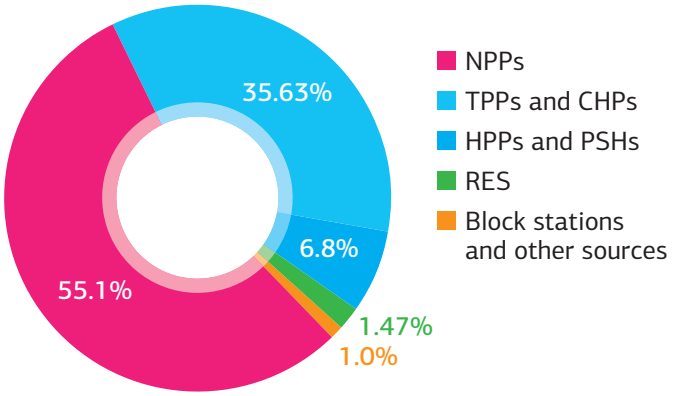


Table 1.2.3. *Dynamics and structure of electricity generation in Ukraine*

	2016		2017	
	Electricity generation, kWh	Share in total electricity generation, %	Electricity generation, kWh	Share in total electricity generation, %
Electricity generation, Total	**154817.4**	**100.0**	**155414.2**	**100.0**
including:				
TPP:	**61494.4**	**39.7**	**55841.3**	**35.9**
TPP utilities, subtotal	49902.3	32.2	44960.0	28.9
TPPs and CHPs	11592.1	7.5	10881.3	7.0
HPPs and PSHs:	**9297.5**	**6.1**	**10567.7**	**6.8**
HPPs	7663.7	5.0	8982.5	5.8
PSHs	1633.8	1.1	1585.2	1.0
NPPs	**80950.1**	**52.0**	**85576.1**	**55.1**
Renewables *(WPPs, SPPs, BioPPs)*	**1774.3**	**1.2**	**2086.3**	**1.47**
Block-stations and other sources	**1515.1**	**1.0**	**1530.9**	**0.73**

Source: NEURC

1.3. RENEWABLE ENERGY SECTOR

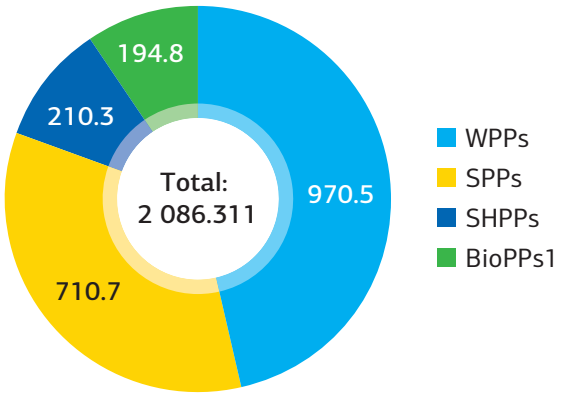
Figure 1.3.1. *Suitable locations for wind investments in SEE*

Source: IRENA, Cost-competitive renewable energy generation: Potential across SEE

Table 1.3.2. *Electricity generation from RES in 2017, according to NEURC*

RES / YEAR	mln kWh
WPPs	**970.496**
SPPs	710.742
SHPPs	210.249
BioPPs	194.824
Share in total electricity generation in Ukraine	1.47%
Total	**2086.311**

Figure 1.3.3. *Green electricity generation in 2017, by types of RES, mln kWh*



Ukraine has a significant potential for the development of renewable energy sources: both technically feasible and cost effective. In January 2017, the International Renewable Energy Agency *(IRENA)* implemented a project to explore the potential for renewable energy use in countries of South-Eastern Europe – "Cost-competitive renewable energy generation: Potential across SEE". According to the findings of the study, Ukraine possesses the largest additional cost-competitive wind potential than any country covered by this study *(up to 119.2 GW)*. A further potential for wind *(up to 200 GW) and solar (up to 70 GW)* can be unlocked by 2030 if more stable frameworks are provided.

The total potential of electricity generation from RES is more than 1 million GWh per year, while wind power accounts for the largest share *(~ 85%)* – 859 000 GWh.

There has been a steady increase in RES capacity in Ukraine since 2011 *(the year when the country's first commercial WPPs were commissioned)*. "The unfavourable tendencies" that had led to the decline of the capacity growth rates in 2014-2016 were caused by the loss of renewable energy facilities located in the territory of Crimea annexed by the Russian Federation and the occupied parts of the Luhansk and Donetsk Regions.

The gradual economic recovery, return to the acceptable rates of the feed-in tariff, replacement of "the local component requirement" with the premium for the use of Ukrainian production equipment *(Law of Ukraine "On amendments to certain laws of Ukraine to ensure the competitive conditions for electricity production from alternative energy sources" No. 514-VIII, 2015)* and adoption of the New Energy Strategy of Ukraine until 2035 *(2017)*, which envisages the growth of RES, have brought the Ukrainian renewable energy market back to the path of growth after nearly two years of stagnation.

As of the end of 2017, the cumulative capacity of renewable energy facilities in Ukraine operating under the "green" tariff increased to 1 183.467 MW. They generated about 1.47% of the total electricity consumed in Ukraine. Wind and solar energy are the largest sources of "green" electricity in the country; in 2017 wind and PV power plants delivered 1 681.238 MWh of electricity, according to the NEURC.

New RE capacity additions in 2017 reached 301.41 MW against 120.649 MW in 2016.

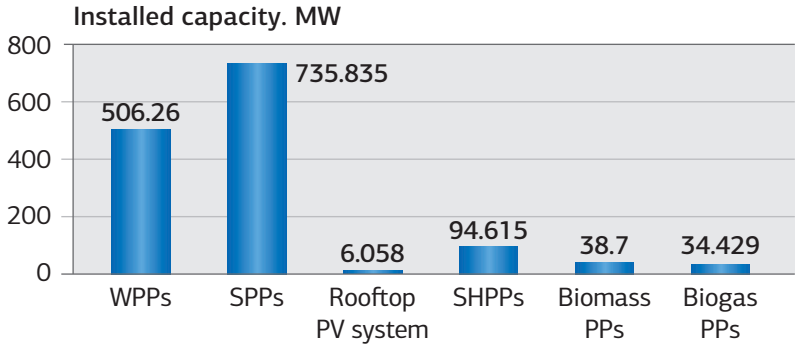
The current installed RES capacity in Ukraine includes:

- Wind Power Plants – 506.26 MW;
- Solar Power Plants – 735.835 MW;
- Rooftop PV systems – 6.058 MW;
- Small Hydro Power Plants – 94.615 MW;
- Biomass Power Plants – 38.7 MW;
- Biogas Power Plants – 34.429 MW.

During 12 months of 2017, all types of RES generated 2 086.311 million kWh *(which exceeds last year's achievements by 311.986 million kWh)*. During 12 months of 2017, PVs generated 710.742 million kWh, which is 218.580 million kWh *(or 31%)* more than the electricity generated during the same period in 2016; small HPPs generated 210.249 million kWh, which is 21.026 million kWh *(or 10%)* higher than the last year's figure.

In 2017, producers of electricity from biomass generated 194.824 million kWh, which is 26.348 million kWh *(or 13.5%)* more than during the same period in 2016.

Figure 1.3.4. *Structure of RES facilities, mainland Ukraine, MW, 2017*



1.4. UKRENERGO'S ONE-STOP-SHOP

At the end of 2016, SE "NEC "Ukrenergo" implemented a one-stop-shop for producers of "green" energy to streamline the procedure for connecting to Ukrenergo's transmission system.

The basic principles of the one-stop-shop are the following:

- the maximum reduction of time for issuing technical specifications for connection to the transmission grid;
- an applicant's communication with an operator through the one-stop-shop by using feedback forms; and
- a customer orientation – an operator will try to provide maximum assistance to customers to ensure that the client's documentation meets the legislative requirements and the company's regulations.

The one-stop-shop offers customer-friendly options for submitting all necessary documents: personally, through a special mailbox, by mail or through on-line forms, integrated on the Ukrenergo official website in the "For Clients" section. E-forms enable filing the applications for the implementation of measures for connecting power plants to certa-

Figure 1.4. *Interactive map of transmission lines, SE "NEC "Ukrenergo"*

in capacities to Ukrenergo's transmission system, obtaining the initial data for the development of a feasibility study for the connection scheme, approving the feasibility study with the customer, approving specifications issued by regional power distribution companies *("oblenergos")*.

The next step towards "green" energy was taken in April 2017, when SE "NEC "Ukrenergo" implemented a new service on its website: an interactive map of the company's transmission system and an on-line calculator. The interactive map shows all substations and transmission lines of the SE "NEC "Ukrenergo"; and due to the integrated data, it is possible to pre-determine the technical possibilities of connecting a new power generation facility, after detailed study of the layout and diagram of the substation. To help an investor, SE "NEC "Ukrenergo" has developed a "green calculator" that will calculate the estimated cost of such connection.

According to State Enterprise "NEC "Ukrenergo", in 2017, the number of applications for connecting the facilities generating power from the renewable energy sources to the transmission lines of SE "NEC "Ukrenergo" increased by more than 4 times against 2016, while the period for consideration of such applications reduced twice and is, on average, 15 days. The web-page with an interactive map and calculator was visited by more than 8 000 users.

1.5. UKRAINE'S ACCESSION TO IRENA

On 7 January 2018, the Law of Ukraine "On Ukraine's accession to the Statute of International Renewable Energy Agency *(IRENA)"* took effect. It was drafted by the State Agency on Energy Efficiency and Energy Saving of Ukraine.

The goal of the International Renewable Energy Agency[2] *(the "IRENA")* is to provide for a fast transition to the extensive and sustainable use of renewable sources of energy globally.

IRENA's work program facilitates the access to information about generation and use of renewable energy, including the verified data of the RES capacities, best practices, efficient financial mechanisms, and details of the state-of-the-art methods of technical expert evaluation, and provides for the emerging economies to have a practical guidance on improvement of their regulatory framework, encourage investments and increase their energy capacities.

Membership in IRENA will enable Ukraine:

- to file to the Abu Dhabi Fund for Development *(the "ADFD")*[3] for soft loans;
- to get access to any information about the renewable energy sources, results of the state-of-the-art research and best practices, and the cutting edge mechanisms for financing of renewable energy development, which is available to IRENA;
- to establish effective cooperation between Ukraine and mature world economies for further development of renewable energy;
- to create conditions for obtaining IRENA's expert support in improving the renewable energy legislation of Ukraine;
- to contribute to lessening the dependence of Ukrainian economy on imports of traditional energy carriers, to improve the competitiveness of Ukrainian products globally and the efficient consumption of fuel and energy resources;
- to increase investments into green projects.

[2] Eligible members of IRENA are the UN member countries and countries that are members of other intergovernmental organisations for economic integration, whose activities are consistent with IRENA's goals. Currently, 150 countries are IRENA members, and 30 countries commenced the procedure to join IRENA.

[3] Currently, the Fund's budget is USD 350 million; loans are extended through competition at 1-2% interest and maturity of up to 20 years, including a 5-year grace period; on condition of 50/50 co-financing (http://www.adfd.ae)

1.6. NEW ENERGY STRATEGY OF UKRAINE FOR THE PERIOD UNTIL 2035: SAFETY, ENERGY EFFICIENCY AND COMPETITIVENESS

On 18 August 2017, at its meeting the Cabinet of Ministers of Ukraine approved the draft "Energy Strategy of Ukraine for the period until 2035: Safety, energy efficiency and competitiveness" *(the "Energy Strategy")*, in which it set out the strategic targets for development of the national fuel and energy complex for the period until 2035. As a part of implementation of the Energy Strategy, it is expected to reduce the energy content of the national economy twice by 2030 and to increase the production of both traditional and renewable energy.

The Prime Minister of Ukraine Volodymyr Groysman called the approval of the Energy Strategy a historic day. "With the new strategy in place, we expect the new structure of demand in energy, which may be presented as follows: by 2035 nuclear energy will account for 50% of the total energy generation in the country; renewable energy – 25%; hydraulic power – 13%, and thermal power plants – the balance", said the Prime Minister.

The Energy Strategy is expected to be implemented by three stages:

STAGE 1. REFORMS IN THE ENERGY INDUSTRY *(UNTIL 2020)*

During this period, it is expected to complete implementing the Third Energy Protocol, to integrate Ukraine into ENTSO-G, and to complete implementing the major part of initiatives on integration of Ukrainian United Energy System into ENTSO-E energy system. To reform the energy generating companies as a part of Ukraine's commitments under the Energy Community Agreement, to increase gas production, to reduce the energy content of GDP, and to further promote RES are key goals of implementing the Energy Strategy at this stage.

During the first stage, it is expected to radically advance the renewable energy sources and increase their percentage in the aggregate consumptive use to 11% *(8% of the aggregate initial energy supply (the "AIES"[4]))* by implementing a stable and forecastable RES promotion policy and encouraging the investments.

STAGE 2. OPTIMISATION AND INNOVATIVE DEVELOPMENT OF THE ENERGY INFRASTRUCTURE *(UNTIL 2025)*

The goal of the second stage of implementing the Energy Strategy is to adapt the Ukrainian UES to operations under new market conditions and integrate it UES into the European energy system; as a result it would be easier to make a well-grounded decision on the best way to increase the energy efficiency: to reconstruct the existing energy facilities or proceed with new energy projects.

ACCORDING TO THE ENERGY STRATEGY FORECASTS, BY 2025 THE ENERGY WILL REPRESENT 12% OF THE AIES.

STAGE 3. PROVIDING FOR SUSTAINABLE DEVELOPMENT *(UNTIL 2035)*

The third stage of the Energy Strategy is aimed at innovative development of the energy sector and construction of new generating facilities, investments into new generating facilities that would replace the depreciated facilities.

Table 1.6.1. *Structure of the AIES, mln toe*

ENERGY SOURCE	2010	2015	2020 *(forecast)*	2025 *(forecast)*	2030 *(forecast)*	2035 *(forecast)*
Coal	38.3	27.3	18	14	13	12
Natural gas	55.2	26.1	24.3	27	28	29
Oil	13.2	10.5	9.5	8	7.5	7
Niuclear	23.4	23.0	24	28	27	24
Biomass, biofuel and waste	1.5	2.1	4	6	8	11
Solar and wind	0.0	0.1	1	2	5	10
Hydro	1.1	0.5	1	1	1	1
Heat*		0.5	0.5	1	1.5	2
TOTAL	**132.3**	**90.1**	**82.3**	**87**	**91**	**97**

** Environmental heat energy and man-made heat waste.*

[4] *AIES means an aggregate initial energy supplies and is calculated as the total of production (extraction), imports, exports, international bunkering of vessels, and change of energy stock in the country.*

DURING STAGE 3, THE USE OF RES IS EXPECTED TO CONSTITUTE 25% OF THE AIES.

The choice of a particular type of electricity generation depends on the forecasted fuel price environment and the rate of growth of each type of generating facility *(which will contribute to increasing the competition between them),* and on the implementation of smart-technologies enabling the consumption peak management.

Table 1.6.2. *Structure of AIES in Ukraine*

RENEWABLE ENERGY SOURCE		2015 *(actual)*	2020 *(forecast)*	2025 *(forecast)*	2030 *(forecast)*	2035 *(forecast)*
Solar and wind energy	mln t	0.1	1	2	5	10
	%	0.1	1.2	2.4	5.5	10.4

Table 1.6.3. *Estimated energy production until 2035 (bln kWh)*

ELEMENT OF THE ENERGY GENERATION STRUCTURE *(basic scenario)*	2015 *(actual)*	2020 *(forecast)*	2025 *(forecast)*	2030 *(forecast)*	2035 *(forecast)*
Water	7	10	12	13	13
Sun and wind	1.6	9	12	18	25

Table 1.6.4. *Energy Strategy: key performance indicators, in progress*

DESCRIPTION OF THE KEY PERFORMANCE INDICATOR		Type	2015	2020	2025	2030	2035
RES share *(including hydrogenating facilities and thermal energy)*	-in AIES, %	target	4	8	12	17	25
	-in energy generation, %	target	5	7	10	>13	>25

Table 1.6.5. *Structure of the AIES, %*

ENERGY SOURCE	2010	2015	2020 *(forecast)*	2025 *(forecast)*	2030 *(forecast)*
Coal	30.4	22	16.1	14.3	12.5
Natural gas	28.9	29.3	31	30.8	30.2
Oil	11.6	11.5	9.2	8.2	7.3
Nuclear	25.5	29.3	32.2	29.7	25.0
Biomass, biofuel and waste	2.3	4.9	6.9	8.8	11.5
Solar and wind	0.1	1.2	2.4	5.5	10.4
Hydro	0.5	1.2	1.1	1.1	1.0
Heat*	0.6	0.6	1.1	1.6	2.1
Total	100	100	100	100	100
Including fossil sources	96	92	88	83	75
Including renewables	4	8	12	17	25

** Environmental heat energy and man-made heat waste.*

1.7. WIND TURBINES MANUFACTURED IN UKRAINE

On 17 May 2017, a plant of Fuhrländer Windtechnology LLC in Kramatorsk completed the manufacturing of the first wind power turbine with unit capacity of 3.2 MW.

It is the most powerful wind turbine ever manufactured not only in Ukraine, but also in the entire post-Soviet area. According to Yevhen Nikitenko, Director of Fuhrländer Windtechnology LLC, the production potential of domestic enterprises enables manufacturing more than 50% of the components of a wind turbine. Other Kramatorsk companies involved in the manufacturing cycle of wind turbines include: Kramatorsk Heavy Duty Machine Tool Building Plant and Energomashspetsstal, Novokramatorsk Heavy Machine-Building Plant. Plastic for a hub and plastic for gondolas and so-called "sheathing" are also of Ukrainian manufacture: namely by the Mykolayiv-based ESTA Ltd enterprise.

In Ukraine, the manufacture of a tower and an anchor cage has been set up: production of fibre glass cabins for gondolas and a hub nacelle, mechanical processing of hub casting, and production of multiple small metal parts and structures for megawatt-class wind turbines are concentrated in Ukraine. Also, gondolas and hubs are assembled, and turbines are installed and commissioned directly in Ukraine.

The company plans to set up the manufacturing of wind turbines with a larger capacity – up to 4.5 MW.

Opening a ceremonial event to celebrate the completion of manufacture of a 3.2 MW wind turbine, Artem Lytvynov – a representative of the Donetsk Regional State Administration and Director of the Department for Development of Basic Industries – emphasised: "This is another step we have made towards Ukraine's energy independence. And it is very important that this wind turbine was manufactured in Donetsk Region."

According to Andriy Konechenkov, Chairman of the Ukrainian Wind Energy Association, Vice-President of the World Wind Energy Association, manufacturing wind turbines of such capacity has already become the norm in Europe. Therefore, the "first-born" of the Kramatorsk enterprise Fuhrländer Windtechnology is another serious step forward in promoting Ukrainian products on the European market."

To date, the plant manufactured 22 wind turbines with a unit capacity of 2 MW and 76 wind turbines of 2.5 MW each. Fuhrländer Windtechnology plans to further expand the existing production capacity by installing the first 3.5 MW wind turbine in 2018 and the first 4 MW wind turbine in 2019.

1.8. WIND POWER FACILITIES COMMISSIONED IN 2017

NOVOTROYITSKA WPP

On 29 September 2017, the opening ceremony of the first stage of the Novotroyitska WPP in Kherson Region with a total capacity of 70 MW was held. The first stage of the Novotroyitska WPP totalling 43.2 MW consists of 12 Vestas V-126 wind turbines with a unit capacity of 3.6 MW.

A distinguished delegation of foreign and Ukrainian guests took part in the opening ceremony, including representatives of financial institutions, on which further financing for wind power projects in Ukraine depends today, in particular, Kyrylo Shevchenko, Chairman of the Board of JSB Ukrgasbank, and Olga Yeriomina, Senior Banker at the Electricity Department of the EBRD. The event participants were greeted by Natalia Boyko, Deputy Minister for European Integration of the Ministry of Energy and Coal Industry of Ukraine; Vsevolod Kovalchuk, Chairman of SE "NEC "Ukrenergo"; Serhii Savchuk, Head of the State Agency on Energy Efficiency and Energy Saving of Ukraine; Oleksiy Ryabchyn, Ukrainian MP; Eva Svedling, State Secretary of the Minister for International Development, Cooperation and Climate of Sweden, who emphasised the importance of wind energy technologies in combating climate change and welcomed those present with such an important event as the opening of a new wind power plant.

WIND PARK PRICHERNOMORSKIY

On 18 October 2017, in Mykolayiv Region, the official commissioning of a 3 MW wind turbine manufactured by Fuhrländer Windtechnology LLC was held at the Prichernomorskiy Wind Park site. Addressing the ceremony participants Yuriy Shevchenko, a representative of the manufacturer, said: "The simplest wind turbine component to manufacture is a tower, which could qualify for a 5% premium of the eligible "green" tariff rate in accordance with Ukrainian legislation. Another important component, namely an anchor cage, which "ties" a foundation with a tower, is also manufactured at our plant. We also perform hub casting, assembling and testing." Although transformers have not been manufactured in Ukraine to date, according to Yuriy Shevchenko, the plant has already developed a technical solution for modernising the transformers, especially in case of failure of their operation.

Today, Wind Park Prichernomorskiy consists of two wind turbines with a unit capacity of 2.5 MW and one 3.0 MW wind turbine. In 2018, a further expansion of Wind Park Prichernomorskiy is planned in order to install 4 more wind turbines with a unit capacity of 3.2 MW.

Management Company "Wind Parks of Ukraine" is the first, and so far the only, company in Ukraine and in the entire post-Soviet area, which uses domestically manufactured wind turbines in its projects.

WPP STARYI SAMBIR-2

On 26 October 2017, in Staryi Sambir District of Lviv Region, the Eco-Optima group of companies officially opened its new wind power plant "Staryi Sambir-2" with a total capacity of 20.7 MW, consisting of 6 Vestas wind turbines with a unit capacity of 3.45 MW. The annual electricity production is expected at 56 million kWh, which is enough to provide two and a half districts of the region with environmentally friendly electricity.

Those present at the opening ceremony of the power plant were greeted by Stepan Kubiv, First Vice Prime Minister of Ukraine; Oleh Sinyutka, Chairman of Lviv Regional State Administration; Sevki Acuner, Country Director EBRD in Ukraine; and Maksym Kozytskyy, Director of WPP "Staryi Sambir-2".

Stepan Kubiv, First Vice Prime Minister of Ukraine, said: "Wind turbines mean a modern system of innovations, large investments and safe energy. This is a complete cycle of production, implementation and use of ideas."

In order to implement the WPP Staryi Sambir-2 project, in 2011, Carpathian Wind LLC was created, which operates this project. The funds invested by the European Bank for Reconstruction and Development, Clean Technology Facility, World Bank, Investment Facility for Developing Countries *(IFU),* and the Northern Environmental Financial Corporation *(NEFCO)* are estimated at more than EUR 34 million. The agreement was signed during XVI International Investment Forum, which was held in Lviv in November 2016.

WPP “SHEVCHENKOVE-1”

Near the Village of Shevchenkovo, in the Obidnyi area of Dolynskyi District, the first wind power plant in Ivano-Frankivsk Region began to generate “green” electricity. The first stage of WPP “Shevchenkove-1” with a total capacity of 6.4 MW, consisting of a NORDEX N43/600 wind turbine with a unit capacity of 600 kW, was commissioned in December 2017. The WPP’s owner is a Ukrainian company Wind Energy. The construction of the WPP is carried out in cooperation with a German partner. The construction of the second stage of WPP Shevchenkivo-1 is scheduled for 2018. The company plans to build another WPP in Ivano-Frankivsk Region, namely WPP Shevchenkovo-2 with a total capacity of 10 MW.

1.9. NATIONAL WIND POWER PROJECTS

The Ukrainian wind power market grew by 68.1 MW in 2017. The overall capacity of all wind turbines installed in mainland Ukraine by the end of 2017 reached 506.26 MW. The installed capacity of WPPs in the Crimea has not changed since 2013 – 87.8 MW.

The UWEA expects a steady increase in wind power capacity by 2020 at over 200 MW per annum. First of all, the new wind power projects will be developed in such regions as Zaporizhzhia, Kherson, Mykolayiv, Odesa, Lviv, Ivano-Frankivsk.

Table 1.9.1. *Operating Wind Power Plants, Mainland Ukraine, 2017*

#	Wind Park name	Wind Park operator/ owner	Generating capacity *(MW)*	Number of turbines	Location	Wind Park status *(in operation, under construction and planned)*
1	Wind Park Novoazovskiy	Wind Parks of Ukraine LLC	57.5	23 x 2,5 MW Fuhrlander FL2500-100	Donetsk Region	constructed, in the occupied territory
2	Wind Park Ochakovskiy comprising Dmitrievskaya WPP Tuzlovskaya WPP	Wind Parks of Ukraine LLC	42.5 30 12.5	19 x 2,5 MW Fuhrlander FL2500-100 12x 2,5 MW 5 x 2,5 MW	Mykolaiv Region	in operation in operation in operation
3	Wind Park Blagodatnyy	Wind Parks of Ukraine LLC	5	2 x 2,5 MW	Mykolaiv Region	in operation
4	Wind Park Prichernomorskiy	Wind Parks of Ukraine LLC	8.0	2 x 2,5 MW 1 x 3,0 MW	Mykolaiv Region	in operation
5	Wind Park Krasnodonskiy	Wind Parks of Ukraine LLC	25	10 x 2,5 MW Fuhrlander FL2500-100	Lugansk Region	constructed, in the occupied territory
6	Wind Park Lutuginskiy	Wind Parks of Ukraine LLC	25	10 x 2,5 MW Fuhrlander FL2500-100	Lugansk Region	constructed, in the occupied territory
7	Vetroenergoprom WPP	Wind Parks of Ukraine LLC	30.53	204 x 0,1075 MW USW56-100 6 x 0,6 MW Turbowinds T600-48 2 x2,5 MW Fuhrlander FL2500-100	Donetsk Region	constructed, in the occupied territory
8	Novorossiyskaya WPP	Vindkraft Ukraina LLC	9.23	3 x 3,075 MW VESTAS V112	Kherson Region	in operation
9	Stavki WPP	Vindkraft Ukraina LLC	9.23	3 x 3,075 MW VESTAS V112	Kherson Region	in operation
10	Beregovaya WPP	Vindkraft Ukraina LLC	12.3	4 x 3,075 MW VESTAS V112	Kherson Region	in operation
11	Novotroitskaya WPP	Vindkraft Ukraina LLC	43.8	12 x 3,65 MW VESTAS V126	Kherson Region	in operation
12	Syvashska WPP	Sivashenergoprom LLC	2.92	16 x 0,1075 MW USW56-100 2 x 0,6 MW Turbowinds T600-48	Kherson Region	in operation
13	Botiyevskaya WPP	DTEK RE Wind Power LLC	200	65 x 3,075 MW VESTAS V112	Zaporizhzhia Region	in operation
14	Staryi Sambir 1 WPP	Eco – Optima LLC	First stage 6.6 Second stage 6,9	2 x 3,3 MW VESTAS V112 2 x 3,45 MW VESTAS V136	Lviv Region	in operation in operation
15	Staryi Sambir 2 WPP	Karpatskyi viter LLC	20.7	6 x 3,45 MW VESTAS V136	Lviv Region	in operation
16	Wind Turbine Bonus	Production Commercial Firm Ligena LLC	0.45	1 x 0,45 MW Bonus 450/37	Kyiv Region	in operation
17	Shevchenkove 1 WPP	Wind Energy LLC	0.6 First stage	1x0,6 MW NORDEX N43	Ivano Frankivsk Region	in operation
TOTAL:			**506.26 MW**			

Table 1.9.2. *Wind Power Plants, Crimean Peninsula, 2017*

#	Wind Park name	Wind Park operator/ owner	Gene-rating capacity *(MW)*	Location	Wind Park status *(in operation, under con-struction and planned)*
1	Donuzlavskaya WPP	Captured by the occupation authorities	6.7725	63 x 0.1075 MW USW56-100	captured by the occupation authorities
2	Sudakskaya WPP	Captured by the occupation authorities	3.7625	35 x 0.1075 MW USW56-100	captured by the occupation authorities
3	Chernomorskaya WPP	Captured by the occupation authorities	1.2	2 x 0.6 MW Turbowinds T600-48	captured by the occupation authorities
4	Presnovodninskaya WPP	Captured by the occupation authorities	7.39	52 x 0.1075 MW USW56-100	captured by the occupation authorities
5	Sakskaya *(Mirnovskaya)* WPP	Captured by the occupation authorities	18.4625	155 x 0.1075 MW USW56-100 3 x 0.6 MW Turbowinds T600-48	captured by the occupation authorities
6	Vorobievskaya WPP	Captured by the occupation authorities	2.365	22 x 0,1075 MW USW56-100	captured by the occupation authorities
7	Tarkhankutskaya WPP	Captured by the occupation authorities	20.05	127 x 0.1075 MW USW56-100 4 x 0.6 MW Turbowinds T600-48 2 x 2 MW UNISON	captured by the occupation authorities
8	Vostochno-Krymskaya WPP	Captured by the occupation authorities	2.813	15 x 0.1075 MW USW56-100 2 x 0.6 MW Turbowinds T600-48	captured by the occupation authorities
9	Wind Park Kerchenskiy	Wind Parks of Ukraine LLC	25	10 x 2.5 MW Fuhrlander FL2500-100	in operation
TOTAL:			**87.81 MW**		

Table 1.9.3. *Wind Power Plants under Construction, as of end of 2017*

#	Wind Park name	Wind Park operator/owner	Generating capacity *(MW)*	Number of turbines
		MYKOLAIV REGION		
1	Wind Park Prychornomorskyi Tuzlivska WPP Lymanska WPP	Wind Parks of Ukraine LLC	12.8	 1 x 3.2 MW 3 x 3.2 MW
		KHERSON REGION		
2	Overyanovskaya WPP	Vindkraft Ukraina LLC	69.0	20 x 3.45 MW VESTAS V126
3	Novotroitskaya WPP	Vindkraft Tavria LLC	25.55	7 x 3.65 MW VESTAS V126
		ZAPOROSHYE REGION		
4	Prymorska WPP – 1	Prymorska Wind Power Plant LLC *(DTEK Renewables)*	100	>3 MW
5	Prymorska WPP – 2	Prymorska Wind Power Plant-2 *(DTEK Renewables)*	100	>3 MW
		ОДЕСЬКА ОБЛАСТЬ		
6	Ovid Wind WPP	GURIS	32.4	9 x 3.6 MW GE
		IVANO-FRANKIVSK REGION		
7	Shevchenkove WPP	Wind Energy LLC	5.8	0.6 MW NORDEX N43
		TERNOPOL REGION		
8		Zboriv poultry factory LLC, town of Zboriv	1.32	2x660 kW Vestas V47
9		Bioenergoproduct LLC	4.0	2x2.0 MW Enercon E70
TOTAL:			**350.87 MW**	

Table 1.9.4. *Wind Power Projects under Development, as of end of 2017*

#	Wind Park name	Wind Park operator/owner	Generating capacity *(MW)*	Number of turbines
		MYKOLAIV REGION		
1	Fedorivka WPP	Wind Parks of Ukraine LLC	2.5	1 x 2.5 MW
2	Limanskiy Wind Park Oliviya WPP	Wind Parks of Ukraine LLC	34.5	5 x 3.2 MW 4 x 2.5 MW 1 x 4.5 MW
3	Tiligulska WPP	Wind Energy Project LLC	500	в процесі тендеру
		KHERSON REGION		
4	Kalanchak WPP	Vindkraft Kalanchak LLC	300	>3 MW
5	Chaplynska WPP	Vindkraft Kalanchak LLC	300	>3 MW
6	Myrnenska WPP	Vindkraft Kalanchak LLC	160	>3 MW
7	Syvashska WPP	Sivashenergoprom LLC	250	>4 MW
		ZAPOROZHZHIA REGION		
8	Orlovska WPP	Orlovska Wind Power Plant LLC *(DTEK Renewables)*	100	>3 MW
9	EuroCape	EuroCape Ukraine 1 LLC	500	in the tender process
10	Azovska WPP	Azov Invest Prom LLC	42.5	in the tender process
11	Belmatska WPP	Ukrainian Wind Group	63.0	in the tender process
		ODESA REGION		
12	Ovid Wind 2 WPP	GURIS	50.4	14 x 3.6 MW
13	South Energy WPP	South Energy LLC	72.6	22 x 3.3 MW
14	Artsyska WPP BEC	Artsyska WPP LLC	33	10 x 3.3 MW
15	Kiliyska WPP	Kiliyska WPP LLC	16.5	5 x 3.3 MW
16	Suvorovska WPP	Suvorovska WPP LLC	19.8	6 x 3.3 MW
17	Izmailska WPP	Izmailska LLC	36.3	11 x 3,3 MW
		LVIV REGION		
18	Skolivska WPP	Eco – Optima LLC	50.4	14 x 3,6 MW
19	Sokalska WPP – 1	Eco – Optima LLC	23.4	6 x 3.9 MW
20	Skolivska WPP – Atlas Global Energy – second phase	Atlas Global Energy LLC	40.0	15 x 2.75 MMW
21	Zaluskiy Wind Park Yavorivska WPP	Wind Power GSI LLC	50.0	15 x 3.3 MW
22	Zaluskiy Wind Park Yavorivska WPP	Wind Power GSI LLC	50.0	15 x 3.3 MW
		IVANO-FRANKIVSK REGION		
23	Pereginska WPP	Clear Energy-Ivano-Frankivsk LLC	93.15	in the tender process
24	Kuryany Wind Park	Wind Energy LLC	13.0	in the tender process
		ZAKARPATTIA REGION		
25	Volovetska WPP	Atlas Volovets Energy LLC	120.0	44 x 2.75 MW
TOTAL:			**2921.05 MW**	

II. CHANGES IN LEGISLATION

2.1. SUMMARY OF RECENT LEGISLATIVE CHANGES

LAW OF UKRAINE "ON THE ELECTRICITY MARKET"

On 13 April 2017, the Verkhovna Rada of Ukraine passed the Law of Ukraine "On the electricity market" *(the **"Electricity Law"**)*, which was published on 10 June 2017.

The Electricity Law implements provisions of the EU Third Energy Package in Ukraine and establishes a transition period for implementing the market segments that are new for the Ukrainian energy industry, in particular: bilateral agreements, day-ahead, intraday, balancing, and support service markets.

Considering its final and transition period provisions, the Electricity Law is expected to take effect by stages, in particular as follows:

11 June 2017 – the Electricity Law took effect, save for some provisions.

10 December 2017 *(6 months after the date of publication)* – provisions addressing the selection of a transmission system operator, its certification, and eligibility criteria for an independent transmission system operator, took effect. An eligible transmission system operator is a legal entity that owns a transmission system, is not a participant of a vertically integrated business entity, and is active in the business that does not depend on the electricity generation, distribution and supply or electricity trading.

The transmission system operator certification procedure was approved by Resolution No 1016 of the National Energy and Utilities Regulatory Commission dated 10 August 2017 and provides that the NEURC is competent to make a decision on certification or denial in certification of the transmission system operator, subject to the opinion of the Energy Community Secretariat. Until the certified transmission system operator takes up its duties, they are performed by State Enterprise "NEC "Ukrenergo" in accordance with the Electricity Law.

10 March 2018 *(9 months after the date of publication)* – provisions of the Electricity Law that regulate connection of the energy facilities to electric networks will take effect. The Electricity Law provides that a distribution system operator will offer both standard and non-standard 'turn-key' connection services under the respective network-connection service agreements.

10 June 2018 *(12 months after the date of publication)* – provisions of the Electricity Law with regard to a universal service provider will take effect. **Universal service** means supplying electricity to households and small private businesses and is a guarantee of providing any consumer with a proper-quality energy across Ukraine. Within a definite territory only one universal service provider may operate. A universal service provider is determined by the decision of the Cabinet of Ministers of Ukraine based on the results of competition.

A universal service provider is under an obligation, *inter alia,* to buy solar-generated electricity and/or wind energy generated by the households' energy facilities *(power generating facilities)* with the installed capacity of 30kW or less at a green tariff in the volume that does not exceed such households' monthly energy consumption. In addition, the universal service provider will offer a service enabling the transmission operator to increase the percentage of electricity generated from alternative sources.

Also, provisions of the Electricity Law addressing the **last-resort** provider will take effect. The last-resort provider's obligation is to provide energy to consumers where energy supplier is not in position to supply energy to them for whatever reasons. The last-resort provider is determined by the decision of the Cabinet of Ministers of Ukraine based on the results of competition for up to three years.

10 December 2018 *(18 months after the date of publication)* – provisions of the Electricity Law will take effect with regard to the selection and autonomy of a distribution system operator. A distribution system operator is prohibited from conducting the electricity generation and/or transmission and/or supply business. The Electricity Law establishes the conditions allowing the distribution system operator as a part of a vertically integrated business entity to be autonomous. Where the number of the connected consumers of the distribution system operator is 100 thousand or less and the monthly average energy distribution is 20 million kW per hour or less, the NEURC may by its decision release such operator from the above-mentioned requirements. A distribution system operator participating in a vertically integrated business entity is obligated to draft and implement the conformity/compliance program.

1 July 2019 – a new electricity market will start its operations. This market will consist of the following segments: balancing, auxiliary service, day-ahead, intraday, and bilateral agreements-based. It is understood that the balancing, day-ahead, intraday, and bilateral agreement markets will be implemented concurrently.

Bilateral agreement market allows the generating companies, energy suppliers, transmission operators, distribution system operators, traders, guaranteed buyers and households sell and purchase electricity. The electricity market participants are free to choose the counterparties for the bilateral agreements, make such agreements in any form and on the terms and conditions agreed by the parties, subject to the limitations established by the Electricity Law.

To operate on the **day-ahead market** or the intraday market, a market participant is required to have a standard-form participation agreement with a market operator. The market operator has no right to refuse to enter into a day-ahead or an intraday market participation agreement, where the market participant duly complies with all market-access requirements. The prices on the day-ahead or intraday market are free *(market)* prices.

The Electricity Law introduced a unified **balancing market,** on which any transmission system operator will purchase and sell electricity to balance a daily electricity demand/offer, and/or sell and purchase electricity to adjust the imbalances *(if any)* of the electricity balance responsible parties.

According to the Electricity Law, the cost of electricity that a company/household selling energy at a green tariff failed to supply because of acting in accordance with the distribution system operator's instructions to reduce the load will be reimbursed to such company/household, save when the distribution system operator gave such instructions because of the limitations imposed within the entire system due to force majeure.

The Electricity Law introduces the **support service market** enabling the purchase/delivery of support services to regulate the frequency and active capacity within the Ukrainian UES, to maintain the energy reliability and quality parameters within the Ukrainian UES, and other services set out by the market rules; for example to provide for the frequency and active capacity management, to maintain capacity and energy balance within the Ukrainian UES, and to maintain energy reliability and quality parameters within the Ukrainian UES.

The Electricity Law allows for **trading** on the electricity market, which means that the respective business entities *(traders)* may resell electricity. Traders will purchase and sell electricity under bilateral agreements and in the formal electricity market segments, save as under power supply agreements with households.

All market players other than consumers, where they purchase electricity under power supply agreements with households, will be **liable for their electricity imbalances.** The balance responsible parties will be financially liable for electricity imbalances towards the transmission system operator.

To mitigate electricity imbalances, the market participant is required either to become a balance responsible party or to delegate his obligations to another balance responsible party by joining a balancing group. Electricity suppliers are the parties responsible for their consumers' balances.

To mitigate electricity imbalance means that a balance responsible party enters into a power purchase and sale agreement with a transmission system operator for the volume of electricity imbalances and at the imbalance prices established in accordance with the market rules.

Any electricity generation licence issued prior to the effective date of the Electricity Law, will be valid until the date when the new electricity market starts its operations.

With effect from 10 June 2020 *(36 months after the date of publication)* – a distribution system operator will be prohibited from beneficiary holding or managing the shares (interests in the charter capital) in any business entity active in the electricity generation and/or supply *(including to households)* or transmission, while a business entity active in the electricity generation and/or supply *(including to households)* or transmission will be prohibited from beneficiary holding or managing shares (interests in the charter capital) in a distribution system operator.

The Electricity Law establishes the following framework for operations of the business entities producing energy from renewable energy sources *(the **"RES Producers"**)*.

I. RES Producers may sell energy *(1)* under bilateral agreements on the day-ahead market, intraday market or balancing market at the prices created on such markets or *(2)* at a green tariff, including a mark-up *(if applicable)*. A green tariff for purchase of electricity from RES Producers is offered to the guaranteed purchaser during the entire life of such green tariff.

II. RES Producers may enter into power purchase and sale agreements with guaranteed purchasers any time prior to the commencement and/or commissioning of the respective power project.

In case of non-commissioning of an energy facility or a stage of a power plant project *(start-up facility)* within three years from the date of registration of the respective construction-work commencement declaration or obtaining of a construction work permit, the agreement becomes invalid.

A green tariff power purchase and sale agreement will be in effect during the entire life of the green tariff.

III. RES Producers may form a balancing group of green tariff electricity producers, in which a guaranteed purchaser is a balance responsible party.

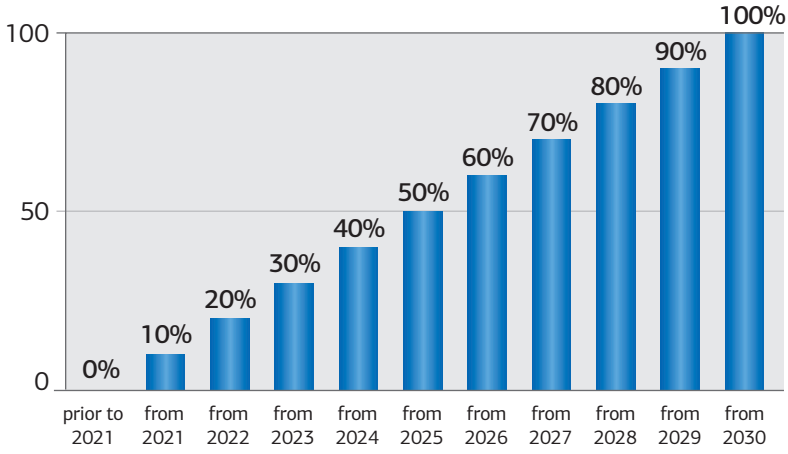
Where the RES Producer's actual hourly electricity supplies differ from the scheduled hourly electricity supplies to the producers that are members of a balancing green-tariff producers group, the costs of mitigation of the guaranteed purchaser's electricity imbalance will be reimbursed in accordance with the regulations of the balancing green-tariff producers group and in the respective percentage. The costs of mitigation of imbalances to the guaranteed producer will be reimbursable by RES Producers that are authorised to use green tariff and are members of the balancing green-tariff producers group with effect from 1 January 2021.

Until 31 December 2029, RES Producers *(wind energy producers)* will reimburse the guaranteed purchasers for energy imbalances where the actual hourly energy supplies differ from the scheduled hourly supplies by 20 per cent of more. If the share of energy generated from all RESs in the total of energy balance of Ukraine is 5 per cent or more, the reimbursable percentage will reduce to 10 per cent. RES Producers whose facilities were commissioned before 11 June 2017 will not reimburse the imbalance costs until 2030.

IV. In the same manner as before, the amended Law of Ukraine "On renewable energy sources" fixes the green tariff rates subject to the time of commissioning of the electricity facilities or electricity project phases/start-up facilities, energy sources and installed capacity and establishes a 5% or a 10% mark-up for the use of equipment of Ukrainian manufacturers.

The regulator establishes the legislative requirements that will apply during the entire life of the green tariff to purchases of electricity from RES Producers at an established green tariff, including the mark-up, and provisions prescribing to pay for the purchases of such electricity in full, during the established period and in the monetary form.

Table 2.1.1. *Growth of percentage of reimbursable imbalance costs (for wind generators)*



Law of Ukraine "On amendments to certain Ukrainian laws and regulations with regard to improvement of urban development activities"

On 10 June 2017, the Law of Ukraine "On amendments to certain Ukrainian laws and regulations with regard to improvement of urban development activities" *(the **"Amendment Law"**)* took effect. It amended a number of laws and regulations addressing the urban development. The Amendment Law provides a new approach to the classification of construction objects by their complexity and the classes of consequences *(criticality)*.

The Law classifies all facilities by the classes of consequences *(criticality)* in the following categories:

I. low level consequences – CC1 *(which replaces complexity categories I and II)*.

CC1 does not cover the facilities *(i)* for which the potential consequences of default *(condition in which the use of any facility or its part in accordance with the intended purpose is unfeasible)* exceed the following numbers: for potential danger to safety and life of individuals permanently staying on the facility – 50 persons; for potential danger to safety and life of individuals staying on the facility from time to time – 100 persons; for material damage or losses suffered by the community because of terminated use of the facility or a loss of integrity – 2.500 minimum wages; *(ii)* cultural heritage objects of the national or regional significance, as determined in accordance with the Law of Ukraine "On protection of the cultural heritage"; *(iii)* new facilities that are constructed within protected zones of a cultural heritage object that has national or regional significance (*the territory of a protected zone is equal to minimum two horizontal or two vertical dimensions of the cultural object); (iv)* high-risk facilities, as identified according to the Law of Ukraine "On high-risk objects"; *(v)* four-floor or higher residential buildings;

II. medium level consequences – CC2 (which replaces complexity categories III and IV);

III. high level consequences – CC3 *(which replaces complexity category V):* cultural heritage objects, as determined by the Law of Ukraine "On protection of cultural heritage"; high-risk facilities, as identified according to the Law of Ukraine "On high-risk objects"; residential, public or multiuse buildings of 100 meters or higher and/or that expose 400 or more persons permanently staying in them to the risk of injury or death.

The Amendment Law permits to commence construction work on CC1 projects *(low level consequences)* where the land owner/user has filed a **construction-work commencement notice** to a respective architecture and construction authority, and on CC2 *(medium level consequences)* or CC3 *(high level consequences)* projects where the land owner/user has obtained a construction work permit.

To obtain the construction work permit the land owner/user files an application and supporting documents, including, *inter alia,* a copy of the document certifying the land ownership or the land use right; the project-specific design documents properly developed and approved in accordance with the established procedure; copies of documents of appointment of the persons responsible for construction work and persons responsible for architectural and technical supervision; details of the licence authorising to conduct construction work; results of environmental impact assessment *(in the instances specified by law),* etc.

Also, the Amendment Law increases the liability for conduct of enablement and construction work without a construction-work commencement notice or a construction work permit, and regulates other procedural aspects.

Draft Law "On Amendments to the Law of Ukraine "On regulation of urban development activities" with regard to creating better investment opportunities in the sphere of generation of electricity from alternative energy sources"

On 19 December 2017, the Law of Ukraine "On amendments to the Law of Ukraine "On regulation of urban development activities" with regard to creating better investment opportunities in the sphere of generation of electricity from alternative energy sources" *(the **"Draft Law"**)* was passed in its first reading. It was drafted by the Ukrainian State Agency on Energy Efficiency and Energy Saving with a view to resolve the problem of ineffective reservation of capacities required to connect the electricity facilities of the renewable energy producers to the electric network.

The problem is that as of today many investors, who have received technical specification for connection to electric networks, for various reasons do not complete the projects. "By now 4.2 GW of the total of 4.5 GW of capacities of the renewable energy facilities have been reserved for connection to the electric networks", Sergiy Savchuk, Head of State Agency on Energy Efficiency and Energy Saving of Ukraine wrote on his Facebook page.

In particular, the Draft Law proposes to limit the effective term of technical specification for energy facilities producing renewable energy to three years from the date of issue.

Also, the Draft Law establishes that technical specification issued prior to the effective date of the Draft Law is valid for three years from the effective date of the Draft Law.

It cannot be excluded that the Draft Law provisions establishing the effective term of technical specification may be further adjusted in accordance with a RES-specific characteristics and demand for various RESs. The UWEA will initiate an increase of the effective term of the new technical specification from 3 years – as set out by the current Draft Law – to 5 years, since for the purposes of installing a WPP it is required to allow for the time for measurement of the wind potential power and for ornithological study. It is also proposed that "upon an extension of the effective term of technical specification to 5 years, the technical specification issued 2 years before the effective date of the Law or earlier will be valid for 3 years from the effective date of the Draft Law."

NEURC RESOLUTION "PROCEDURE FOR OPEN DISCUSSION OF DRAFT DECISIONS OF THE NATIONAL ENERGY AND UTILITIES REGULATORY COMMISSION", NO 866, DATED 30.06.2017

The Procedure for open discussion of draft decisions of the National Energy and Utilities Regulatory Commission *(the **"Procedure"**)* establishes the mechanism of arranging for and holding of open discussion of NEURC draft decisions, with a specific focus of the following key areas:

i. establishing of prices *(tariffs);* approval of investment programs and roadmaps *(the **"Block 1"**);*

ii. consideration of comments and proposals to the draft decisions that have signs of regulatory acts *(the **"Block 2"**);*

iii. draft NEURC budget for the respective year and other issues that are within the competence of NEURC and cover the business entities whose activities are regulated by the state represented by the NEURC *(the **"Licencees"**).*

The purpose of open discussions of draft decisions addressing the above-mentioned issues is to achieve the balance of interests and grant stockholders an unimpeded access to information.

Procedure for open discussion of NEURC draft decisions regarding Block 1 issues:

According to the Procedure, the issues of prices *(tariffs/their changes),* approval of investment programs/roadmaps and amendments to them may be submitted to the NEURC for consideration and open discussion by both the Licencees and the NEURC itself.

In general, the procedure for open discussion of draft NEURC decisions on Block 1 issues consists of the following stages:

i. **Initiation of an open discussion; depending on the subject matter, there are two options to initiate an** open discussion:
   - The Licencee initiates an open discussion of the draft decision, in particular: *(I)* publishes a notice of open discussion and its subject matter on its official website, including the substantiation of the relevance of approval of the respective decision, the issues to be commented on, and the term for submission of the related comments and proposals to the Licencee; *(II)* classifies the comments and proposals received and records them as minutes; *(III)* posts such minutes on its official website and further submits the minutes to the NEURC; or
   - The NEURC initiates an open discussion of its draft decision by posting the approved draft decision and information substantiating the relevance of its approval, including additional information and materials specified in the Procedure, on NEURC official website.

ii. **Further open discussion of the initiated draft decision of NEURC**. A structural subdivision of the NEURC, whose competence covers the issue submitted for open discussion *(the **"Drafter"**),* will provide for further open discussion in accordance with the Procedure.

iii. **Classification of the results of open discussion**. Based on the results of open discussion completed, the Drafter issues the minutes and a table summarising the points that have been agreed upon.

iv. **Further drafting of NEURC** decision in accordance with the Law of Ukraine "On the National Energy and Utilities Regulatory Commission" *(the "NEURC Law")* and the NEURC Rules of Proceedings.

On 5 October 2017, the NEURC adopted amendments to the above procedure and reduced the term for promulgation of its decisions regarding the green tariff from 20 to 5 business days before the date of the decision.

Procedure for open discussion of NEURC draft decisions regarding Block 2 issues:

A NEURC decision that has signs of a regulatory act *(the **"Draft Regulatory Act"**)* is elaborated on in accordance with the procedure set out by the NEURC Law and NEURC Rules of Proceedings, and is further discussed as follows:

i. The Drafter collects comments and proposals to the draft Regulatory Act.

ii. **The Drafter elaborates on the comments** and proposals to the Draft Act and further posts such draft, including the comments and proposal, on the NEURC official website, with references to information and documents set out by the Procedure.

iii. Open discussion (consideration of comments and proposals) of the Draft Regulatory Act is held at the NEURC; during the discussion directors/CEOs of the Drafter, other NEURC's structural subdivisions, and individuals who provided comments and proposals to the draft decision that has signs of a regulatory act should be present *(where such draft decision addresses the development of a particular region and/or territorial community).*

iv. Results of open discussion of the Draft Regulatory Act are classified and formalised as minutes to be supported by a table summarising the comments and proposals given, and debatable provisions of the Draft Regulatory Act.

v. The said minutes and table are posted on the NEURC official website no later than 5 business days after the approval of the minutes by the NEURC.

In case of substantial amendments to the Draft Regulatory Act, the NEURC may re-resubmit it for public discussion, and collect and review new comments and proposals.

NEURC Resolutions "On approval of amendments to the Standard Power Purchase and Sale Agreement between State Enterprise "Energorynok" and a producer of renewable energy"

To extend the investors' pool, to get the lower-interest loan, to protect the rights of investors and creditors, the NEURC in cooperation with major financial institutions *(EBRD, IFC, OPIC)* has drafted amendments to the Standard Power Purchase and Sale Agreement between the State Enterprise "Energorynok" and a producer of renewable energy.

At its meeting on **14 September 2017,** the NEURC unanimously voted for the decision to approve Resolution **No 1118** "On approval of amendments to the standard power purchase and sale agreement between State Enterprise "Energorynok" and a producer of renewable energy". The said Resolution took effect on the day following the date of its publication in the official print media – the government newspaper **Uriadovyi Kurier** dated 28 October 2017, No 203.

In particular, the following amendments were approved unanimously:

- the effective term of the agreement – until 1 January 2030 *(the green tariff's life).* It is one of the most longed-for changes. Prior to it, power purchase and sale agreements were executed for one year, with an option of subsequent one-year extensions. Such mechanism complicated the attraction of long-term investments into the respective projects;
- an option to assign the right of claim in order to protect the creditors' rights;
- the right of either party to the agreement to refer disputes to international arbitration *(Paris, France),* which is a reliable instrument for protection of the investors' rights;
- extension of the list of circumstances qualified as force majeure; explicit definition of force majeure;
- an option to make a preliminary agreement (known as "Pre-PPA"). It is permitted to make a power purchase and sale agreement at the initial stage of the project, prior to the construction completion and acceptance of energy facilities into service; however, the agreement will take effect solely upon performance of certain conditions precedent *(in particular, upon obtaining of an electricity generation licence, fixing of a producer-specific green tariff, registration on the Wholesale Electricity Market in Ukraine, etc.).*

In addition, on 9 January 2018 the NEURC approved Resolution No 1, which amends the Standard Power Purchase and Sale Agreement *(the* ***"Standard Agreement"****)* between State Enterprise "Energorynok" and a producer of renewable energy as follows:

- the creditors may enter into direct agreements with the purchasers; provided however, that such agreements contain provisions that limit the period for exercise by the purchaser of the termination right. In particular, a purchaser of electricity has no right to terminate the agreement within 120 days from the date of a written notice to the creditors *(or their agents)* regarding its intent to terminate the agreement; such term will be granted to the RES Producer to cure a breach of his obligations;
- the purchaser's consent is no longer required for the RES Producer to assign his rights under the power purchase and sale agreement to the creditors;
- the force majeure clause has been improved and extended;
- the Resolution defines a change of law concept. Upon a change of law, the parties will negotiate the required amendments to the agreement; however, if they fail to agree the respective amendments the RES Producer will have the right to terminate the agreement and claim damages.[5]

In particular, the following events qualify as a change of law:

(1) a reduction, termination or suspension of a green tariff, a change of the green tariff application mechanism or the green tariff settlement procedure;

(2) a cancellation, refusal to extend, or other material change of conditions applicable to any governmental approval, licence, permit or other regulatory instrument that was made available to the producer earlier, save as due to a breach by the producer; or

(3) the implementation, approval, cancellation *(in full or in part)* of or amendment to any laws or regulations governing the energy sector *(including a change in the tax treatment),* where their implementation, approval, cancellation or amendment would affect the designing, construction, operation or maintenance of the energy facility and/or financial standing of the producer.

- RES Producers get broader rights to terminate the power purchase and sale agreement, including upon a change of law;
- RES Producers get broad rights to claim damages from the purchaser of electricity, including upon termination at the purchaser's initiative. In particular, amendments to the Resolution establish the amount and procedure for the termination payment, which consists of, without limiting to, the RES Producer's outstanding principle *(including any and all interest and fees payable in connection with it)* under the loan granted to it by an international financial institution and all amounts due and payable by the RES Producer to the hedging counterparties *(including for hedging of interest and currency risks in connection with the indebtedness to the creditors),* all other expenditures and losses as may be incurred

[4] In addition, subject to the character of the change of law and the parties' actions an indicator that lacks explicit definition in the Resolution is taken into account – an increase in expenses incurred by the RES Producer due to such change of law against the RES Producer's proceeds from electricity sales for the most recent 12 months. In particular, the RES Producer may terminate the agreement where as a result of one or more change(s) of law the RES Producer's expenses increased (including due to any payment, taxes, duties or fees that may be charged from the RES Producer) by 10% or more of his proceeds from electricity sales against his proceeds for 12 months from the date of the earliest of such changes of law.

by the creditors and hedging counterparties in connection with termination of the agreement, etc. Any part of the termination payment is calculated in Euro and is paid by equal monthly instalments that are due and payable on the last day of the respective quarter in Hryvnias upon conversion of the respective Euro amount into Hryvnias at the official exchange rate set out by the National Bank of Ukraine as of the date of payment;
- a revocation of the electricity generation licence will not automatically terminate the power purchase and sale agreement.

The purpose of the above-mentioned amendments to the Standard Agreement is to further improve the mechanism of protection of rights of RES Producers and investors in renewable energy (in particular, international financial institutions), the investment attractiveness of projects, and to encourage investments into the industry. The majority of risks related to the change of law or the circumstances that are beyond the parties' control are assigned explicitly to the purchaser of electricity. Some amendments may seem debatable from the perspective of the competition law or trigger ambiguous interpretation of their content or feasibility of implementation due to the lack of clarity and definiteness *(like references to the producer's proceeds, direct agreements, negotiation procedures, 'appeals' against arbitration awards, etc.)*. The issue of feasibility and stability of the approach to the allocation of risks and compensation of damages remains open.

LAW OF UKRAINE "ON ENVIRONMENTAL IMPACTS ASSESSMENT"

On 18 December 2017, the Law of Ukraine "On environmental impact assessment" *(the **"Law 2059-VIII"**)* took effect. Its purpose is to provide for the environmental safety, environmental protection, and transparency of the decisions that are crucial for business, to prevent negative environmental impact, and to improve the balance between the interests of public and private sectors.

Law 2059-VIII implements the requirements of Directive 2011/92/EU of the European Parliament and of the Council "On assessment of the effects of certain public and private projects on the environment", dated 13 December 2011. Also, after the approval of Law 2059-VIII, the Energy Community Secretariat dismissed the case against Ukraine for improper implementation of the said Directive with regard to Ukraine's commitments as a member of the Energy Community.

Law 2059-VIII introduces a mandatory environmental impact assessment *(the **"EIA"**)*, which replaces the ecological expert evaluation. It is not less important that Law 2059-VIII introduces the procedure for public discussion of all major EIA documents and prescribes to enter them into the Unified Register of Environmental Impact Assessment *(the **"EIA Register"**[6])* that will be created for this purpose.

EIA will be mandatory for a wide range of businesses and facilities classified by Law 2059-VIII in the following categories:
- **Category One** *(which includes, for example, petroleum and gas refineries, thermal power stations, nuclear fuel production and enrichment facilities and nuclear waste disposal facilities, construction of 15 kilometre or longer overhead transmission lines of 220kV or higher voltage, etc.)*; and
- **Category Two** *(which includes, for example, hydroelectric power plants, wind farms and 50-meter or higher power plants with two or more turbines)*.

The Ministry of Ecology and Natural Resources of Ukraine *(the **"Ministry"**)* will issue EIA opinion regarding the business and facilities classified within the first category, while the respective ecology and natural resources divisions of local state administrations will issue EIA opinions for the businesses and facilities classified within the second category. In addition, in respect of the Category One applicants it is required to verify whether there are grounds for assessment of the potential transboundary effect of their activities on the environment.

The competent authorities will carry out an EIA prior to issuing permits for the respective activities. EIA opinions and other EIA documents will be valid for 5 years and will be used to obtain other authorisations for the respective activities.

Exceptions. EIA is not required where the business entity has already obtained the results of state ecological expert evaluation prior to the enactment of Law No 2059-VIII in accordance with the then applicable procedure. Also, EIA is not required for certain types of the intended business aimed solely at providing for the national defence (e.g. liquidation of consequences of incidents, consequences of antiterrorist operations within the ATO territory during the period of such operation).

Sanctions for violation of EIA legislation. Violations of EIA legislation may result in temporary prohibition for conduct *(suspension)* or termination of business; however, solely by the court decision to that effect, which may be issued pursuant to the claim by a competent governmental authority or any other persons whose rights or interests are violated.

[5] *Computerised system for collection, processing, consideration, accumulation, storage and granting access to the EIA-related data and documents.*

The general grounds for termination of business operations of a business entity or its subdivisions *(plants, shops)* and equipment are: *(i)* conduct of business without passing the EIA and/or *(ii)* repeated breaches in the sphere of EIA that are non-rectifiable for technical, economic or other reasons.

However, Law No 2059-VIII does not contain an explicit list of grounds for the application of the above-mentioned sanctions, nor establishes any criteria for identification of the "repeated breaches", nor distinguishes between the instances when it is required to terminate the business entity's operations in general or operations of its individual plants *(shops)* or equipment. Thus, the competent authorities may want to apply sanctions at their discretion.

Key EIA stages:

- a business entity files a notice of the intended business to the competent authority;
- the competent authority makes the notice publicly available and enters it in the EIA Register;
- the business entity drafts a report on the environmental impact assessment *(the "EIA Report")* in accordance with Law No 2059-VIII;
- the business entity files the EIA Report to the competent authority and enters it into the EIA Register;
- the EIA Report is submitted for civil discussion to be held in the form of civil hearing and further written comments or proposals;
- the competent authority issues an opinion regarding the assessment of environmental impact, in which it either qualifies the intended business as permissible or substantiates the grounds for prohibiting the intended business and defines environmental conditions under which it may be permitted.

RESOLUTION OF THE CABINET OF MINISTERS OF UKRAINE "ON APPROVAL OF CRITERIA FOR IDENTIFICATION OF THE INTENDED BUSINESS THAT IS NOT SUBJECT TO ENVIRONMENTAL IMPACT ASSESSMENT AND CRITERIA FOR IDENTIFICATION OF BUSINESS EXTENSIONS / CONVERSIONS AND FACILITIES THAT ARE NOT SUBJECT TO ENVIRONMENTAL IMPACT ASSESSMENT", NO 1010, DATED 13.12.2017 *(THE "CMU RESOLUTION")*

This CMU Resolution approved, in particular, the following:

- **Criteria for identification of business that is not subject to EIA**

The below types of the intended business, which are set out in Article 3 of Law 2059-VIII, are not subject to EIA*: (i)* Category One intended business and facilities that may have a significant environmental impact *(e.g. construction of 15 kilometre or longer overhead transmission lines of 220kV or higher voltage);* and *(ii)* Category Two intended business and facilities *(e.g. wind farms and 50-meter or higher power plants with two or more turbines).*

However, such intended business is not subject to EIA, provided always that its goal is solely the national defence, liquidation of consequences of force majeure, consequences of ATO in the territory on which ATO is carried out.

- **Criteria for identification of business extensions/conversions and facilities that are not subject to EIA**

Some extensions and conversions qualified as certain types of Category One and Category Two intended business and facilities, as set out in Article 3 of Law 2059-VIII, are not subject to EIA, provided, however, that:

- such conversion of business and facilities will not cause (i) an increased accumulation of hazardous wastes, increase or creation of new sources of atmospheric emissions or discharge of hazardous wastes into water, *(ii)* acoustic, vibration, visual, thermal or radiation pollution, or *(iii)* emissions;
- extension of business and facilities does not exceed the threshold limit values established for the respective types of business or facilities, which are set out by Law 2059-VIII;
- conversion of business is not connected with liquidation *(disassembly),* reclamation or conservation of facilities or territories.

Thus, it could be concluded that activities aimed at providing for the national defence and elimination of emergencies as well as activities that do not increase an environmental impact are not subject to EIA.

RESOLUTION OF THE CABINET OF MINISTERS OF UKRAINE "ON APPROVAL OF "PROCEDURE FOR FILING THE DOCUMENTS FOR OBTAINING AN ENVIRONMENTAL IMPACT OPINION AND FOR FUNDING THE ENVIRONMENTAL IMPACT ASSESSMENT" AND "PROCEDURE FOR MAINTENANCE OF THE UNIFIED ENVIRONMENTAL IMPACT ASSESSMENT REGISTER", NO 1026, DATED 13.12.2017 *(THE "RESOLUTION NO 1026")*

Resolution No 1026 approved two documents:

i. **Procedure for filing the documents for obtaining an environmental impact opinion and for funding the environmental impact assessment *(the "Filing Procedure")***

It establishes the form, structure, content and mechanism of a business entity's filing to the competent environmental and natural resource authorities to obtain an EIA opinion and funding for the environmental impact assessment.

The procedure provides for filing via an account at the EIA Register by using a digital signature, and an option of filing such documents in English (in case of potential transboundary environmental effect).

ii. **Procedure for maintenance of the Unified Environmental Impact Assessment Register *(the "Register Maintenance Procedure").***

The Register Maintenance Procedure establishes the mechanism for maintenance of the EIA Register in accordance with the Unified Register of Environmental Impact Assessment as prescribed by Law 2059-VIII.

The data and documents are entered into the EIA Register by officers of the competent authority via the accounts opened with the EIA Register. The EIA Register responds automatically upon registration of such data and documents and certifies the fact and time of their receipt by sending a link to them in the EIA Register to e-mail address of the sending business entity.

The documents and information about the intended business will be maintained in the registration file generated within the EIA Register and will be accessible via the EIA Register website any time during the period of intended business.

RESOLUTION OF THE CABINET OF MINISTERS OF UKRAINE "PROCEDURE FOR CONDUCT OF CIVIL HEARING DURING THE ENVIRONMENTAL IMPACT ASSESSMENT", NO 989 DATED 13.12.2017.

The procedure defines the mechanism of conduct by the competent authority of civil hearing regarding the intended business of the business entity, which is subject to EIA. The major aspects formalised by the said Resolution notably include the following:

- the date of public hearing is not less than 10 business days from the date of public disclosure by the competent government authority of a notice of commencement of civil hearing of the EIA report. In particular this competent government authority holds hearing, considers the comments and proposals made by the community, drafts the report on public hearing and makes it publicly available through the EIA Register;
- during the hearing all participants have equal opportunities to express their opinions, make proposals and comments;
- if and when so required for the civil hearing, the entity that organises the hearing *(is responsible for conduct of civil hearing, in particular, for recording the participants of hearing and their reports in respective minutes of such hearing, provides for audio or video recording, presides during the hearing, and drafts minutes based on the results of hearing)* may be engaged into it and respective experts or EIA specialists may be invited to speak at the civil hearing;
- within a civil discussion a number of civil hearings may be held, depending on the degree of potential effect of the intended business on the respective territory covered by it;
- public hearing will be deemed invalid, if the initiator and the respective business entity expected to conduct the intended business do not appear for hearing; in such case the public hearing may be re-convened.

2.2. MAJOR REGULATORY ACTS EXPECTED TO BE APPROVED IN 2018

For the most recent years, Ukraine has been implementing the initiatives on harmonisation of the national legislation with the requirements of the EU Third Energy Package, which is one of the prerequisites of integration of the Ukrainian electricity market into the regional electricity markets and further integration with the all-European electricity market.

The basic regulatory act implementing the structural changes in the energy industry for the modernisation and integration of the Ukrainian electricity market with the all-European electricity market is the Law of Ukraine "On the electricity market", which was approved by the Verkhovna Rada of Ukraine on 13 April 2017 *(as addressed in more details in Section I above).*

Effectively, implementing the provisions of the said Law will concurrently implement a new model of the intended electricity market and new efficient mechanisms of its operation.

To provide for implementation of the new electricity market and coordination of this process, by its Resolution "On creation of the Coordination Centre for support of implementation of the new electricity market", No 559, dated 9 August 2017, the Cabinet of Ministers of Ukraine created the Coordination Centre for support of implementation of the new electricity market *(the "Coordination Centre")*, determined its members, and approved the Regulations on the Coordination Centre.

In particular, it is established that the Coordination Centre is an ad hoc temporary consulting and advisory body of the Cabinet of Ministers of Ukraine, which is created to coordinate the efforts of the state authorities, institutions, organisations and business entities aimed at providing for the implementation of a new electricity market, drafting the proposals and recommendations regarding the measures related to the implementation of the new electricity market, and exercising control over the implementation of such measures in accordance with the Law of Ukraine "On the electricity market".

Also, in the course of drafting of the said Law and preparing the new model of the electricity market for implementation in Ukraine, a Roadmap for implementation of the new model of the electricity market in Ukraine *(the "Roadmap")* has been developed and supported by the major business entities and institutions operating in this area, including the NEURC, the Ministry of Energy and Coal Industry of Ukraine, SE "NEC "Ukrenergo" and SE "Energorynok".

Clause 17 of Final and transition period provisions section of the Law of Ukraine "On the electricity market" imposed on the NEURC an obligation within nine months from the effective date of the Law to approve the list of documents, including the Code of Commercial Electricity Metering *(the "Commercial Metering Code")* and the Code of Transmission Systems. Also, according to clause 20 of the said section of the Electricity Law, SE "NEC "Ukrenergo" is responsible for drafting of documents, including the said Codes, and submission of drafts to the NEURC for consideration.

As a part of implementation of the Roadmap and the said provisions of the Electricity Law, SE "NEC "Ukrenergo" drafted some regulatory acts regulating operations in the energy industry of Ukraine, in particular the draft Transmission Systems Code and the draft Commercial Metering Code, and in November 2917 published them for discussions.

In addition, the NEURC approved new conditions of licencing the electricity generation, resale, supply and electricity market operator's business; drafted the price formation methods *(procedure)* applicable for connection to the electricity transmission and electricity distribution systems; drafted the Distribution System Code, the regulations governing the functioning of multiple segments of the new electricity market, in particular, the day-ahead and intraday segments, regulations on the retail electricity market, etc.

DRAFT TRANSMISSION SYSTEMS CODE[6]

The Transmission Systems Code is a code of requirements and rules governing the relationship between transmission system operators and transmission system users with regard to planning, development and management *(including the operative and process management)* of the transmission system within a unified energy system of Ukraine, and connection and access to the transmission system.

[6] *For full text please go to: https://ua.energy/wp-content/uploads/2017/02/KSP_03.11.2017-bez-vydil.pravok.pdf*

The approval of the Transmission Systems Code will speed up the harmonisation of technical parameters of the Ukrainian UES with general minimum requirements of the European Network of Transmission System Operators for Electricity, synchronisation of the Ukrainian UES with ENTSOE electric energy systems and will contribute to the minimisation of technical limitations for the operation of the electricity market, including power export/import. In their turn, all together these efforts will result in the increased reliability of operation of the Ukrainian UES and safe supply of electricity to the consumers.

In particular, the Transmission Systems Code defines the following:

- the procedure for planning the development of the transmission system;
- the conditions and procedure for access to the transmission systems;
- the conditions and procedure for connection to the transmission systems;
- the characteristics and procedure for provision of support services to the transmission system operators;
- the operating management procedure;
- the procedure for management and operation of the transmission system in the standard mode and under emergencies;
- the operational security standards, the criteria applicable by the transmission system operator for dispatching control over generating facilities and use of transnational crossings;
- the procedure for dispatching control over the distributed generation and the condition of prioritizing the energy facilities that use renewable energy sources.

Also, it is worth noting that section 13 *(Transition period and closing provisions)* of the draft Code sets out that transmission service agreements and dispatching (operative and process) management service agreements are made after the commencement of operations by the certified transmission system operator. Until he takes up his duties, the agreements made with the centralised dispatching *(operative and process)* management service provider within the Ukrainian UES will operate.

The requirements of this Code with regard to relationships between a transmission system operator and a transmission system user should be formalised in a transmission service agreement and a dispatching *(operative and process)* management service agreement between them. Until such agreements are made, the requirements of the Code must be documented in the effective agreements by signing the amendment agreements. The effective agreements should be amended within six months upon the approval of the Code by the Regulator.

Consequently, the purpose of approval of the Transmission Systems Code is to provide for regulation and detailed legislative guidance on the procedure for planning of the development of the transmission system, the conditions and procedure for access to the transmission system, the conditions

and procedure for connection to the transmission system, the characteristics and procedure for granting of support services to the transmission system operator, the procedure for operative planning, the procedure for management and operation of the transmission system in the standard mode and under emergencies, the operational security standards, the criteria applicable by the transmission system operator for dispatching control over generating facilities and use of transnational crossings, and the procedure for dispatching control over the distributed generation and the condition of prioritizing the energy facilities that use renewable energy sources.

DRAFT COMMERCIAL METERING CODE[7]

The relevance of drafting the Commercial Metering Code is substantiated in Article 33 *(17)* of the Electricity Law and is connected with the need to formalise the requirements to arranging for commercial electricity metering.

The Commercial Metering Code establishes the principles of arranging for commercial electricity metering on the electricity market in Ukraine and defines the principles and procedures for generation of data regarding the produced, transmitted, distributed, consumed, imported and imported energy in order to use such date on the electricity market.

In particular, the draft Commercial Metering Code that was made publicly available:

(i) establishes the rights and obligations of the parties with respect to arranging for commercial electricity metering and obtaining the accurate and reliable data of commercial metering that would enable commercial settlements, and provides for equal rights and non-discrimination of the electricity market participants;

(ii) defines:
- basic provisions addressing the arranging for commercial electricity metering on the electricity market;
- the rights and obligations of the market players, commercial-metering service providers, and commercial metering administrator with regard to providing for commercial electricity metering and obtaining the accurate and reliable commercial accounting data;
- the procedure for registration of commercial accounting service providers, the commercial accounting point, and registration of computerised systems used for commercial electricity metering.

The provisions and requirements of the Code cover and are binding for all participants of the electricity market and commercial-metering service providers engaged by them.

Consequently, the purpose of approval of the Code is to establish clear procedures and rules for commercial electricity metering by the market participants on a competitive (non-discrimination) basis, which will provide for the appropriate operation of the new electricity market and will make it possible to regulate the procedures for metering, recording, generation and validation of commercial metering data; to install, adjust, test, maintain, operate and provide for the safety of the metering equipment and commercial electricity metering systems, and cooperation between the electricity market players in the course of taking and/or sharing the commercial metering data.

As a summary of this section, it could be concluded that in view of the common efforts to modernise the electricity market in Ukraine and to build up a new model for its operation, as provided for by the Electricity Law and a number of regulatory acts to be drafted and further approved in furtherance of the Law, it could be expected that in 2018 the competent authorities will approve a number of new regulatory acts aimed at establishing and/or changing the currently effective rules and regulations on operation of the national electricity market.

[7] *For full text please go to: https://ua.energy/wp-content/uploads/2017/02/KKO_2017-11-03.pdf*

III. UWEA ACTIVITY

BASED ON ITS PERFORMANCE IN 2017, THE UKRAINIAN WIND ENERGY ASSOCIATION GOT THE STATUS AND RANK OF «CHOICE OF UKRAINE 2017». THE UWEA WAS CHOSEN AS THE BEST EXPERT ASSOCIATION IN THE FIELD OF RENEWABLE ENERGY.

The "Choice of Ukraine" is awarded to winning companies for a substantial contribution to the country's development. An expert assessment is conducted annually by the ICCA 50 *(Congress and Convention Association at 50)* in order to identify leaders amongst the Ukrainian enterprises based on the companies' financial and economic performance.


Вибір України
2017 року

Choice of Ukraine
2017 year

ВИБІР УКРАЇНИ
2017

Зареєстрований у БДК 20 червня 2016 року – №0297 –

Сертифікат
Certificate

який підтверджує, що за офіційними даними державних органів статистики України
this is to certify, that according to the official figures of state statistics of Ukraine

ГС «УВЕА»
PU «UWEA»

У результаті дослідження методом ICCA-50 (Congress and Convention Association at 50), серед підприємств, які працюють в Україні згідно з показниками фінансово-господарської діяльності, підприємство було нагороджено «Вибір України 2017 року»

The study by ICCA-50 (Congress and Convention Association at 50), among the companies working in Ukraine according to indicators of financial and economic activity, the company was awarded the status title of «Choice of Ukraine 2017»

Генеральний директор
ТОВ «Вибір України»
Бертов Семен Володимирович

Director of Ukraine
rating «Choice of Ukraine»
Bertov Semen

«ВИБІР УКРАЇНИ»

Президент Комітету статистики
Сем Кромстейн

President of the Statistics Committee
Sim Kromstein

3.1. PARTICIPATION IN THE LEGISLATIVE PROCESS

The year 2017 can be called a "tipping point", taking into account important changes in Ukrainian legislation for further development of the national energy system. In particular, as noted in Section II of this Review, in 2017, two fundamental documents – the **Law of Ukraine "On the electricity market"** and the **New Energy Strategy of Ukraine for the period until 2035** – were adopted; both will have an impact on further development of the wind energy industry in Ukraine and the entire renewable energy sector. The UWEA directly participated in drafting these documents and provided its suggestions and comments during the discussion of the drafts.

NEW ENERGY STRATEGY OF UKRAINE FOR THE PERIOD UNTIL 2035

The experts and members of the UWEA were actively involved in the drafting and discussion of the Draft New Energy Strategy of Ukraine for the period until 2035. In particular, on 18 January 2017 the UWEA representatives took part in a joint meeting of the Parliamentary Committee on Fuel and Energy, Nuclear Policy and Nuclear Safety and the Collegium of the Ministry of Energy and Coal Industry of Ukraine, where the Draft Energy Strategy of Ukraine for the period until 2035 *(the **"Draft Energy Strategy"**)* was presented.

In his introductory speech, Oleksandr Dombrovskyi, First Deputy Chairman of the Parliamentary Committee on Fuel and Energy, Nuclear Policy and Nuclear Safety, said, "I am convinced that the Energy Strategy of Ukraine for the period until 2035 should become a road map specifying the key target functions that give prospects for energy development and ensure energy security. It should specify the key indicators and beacons that the energy system of Ukraine should reach by 2035."

The UWEA criticised the proposed provision in the Energy Strategy for "*shifting the emphasis of the state policy from the electricity generation by large installations using mainly solar and wind power toward low-capacity RES facilities," considering that "the development of a new energy system in Ukraine should take place in parallel with the development of national industry, which, in turn, will allow creating new jobs"*. The UWEA's position was taken into account by the State Agency on Energy Efficiency and Energy Saving of Ukraine and coincided with the European Commission's comments on the Draft New Strategy.

UNIFIED "GREEN" TARIFF FOR HOUSEHOLDS

On 21 July 2017, at a meeting of the National Energy and Utilities Regulatory Commission Public Council, public hearings were held, which addressed the introduction of a "green" tariff and a unified accounting system for hybrid/combined energy systems using renewable energy sources for private households. The Ukrainian Wind Energy Association initiated conducting these public hearings.

In their presentations, Andriy Konechenkov, a member of the NEURC Public Council and Chairman of the UWEA, Mykola Savchuk, Board Member of the UWEA, and Yaroslav Petrov, Counsel at Law Firm Asters, presented a technical and legal vision for the introduction of a unified "green" tariff for combined wind-sun power systems, namely:

- Obtaining a general *(single)* upper value of the "green" tariff for households, where solar and wind systems with a total capacity of up to 30 kW inclusive are installed.
- Introducing one accounting system for households, where solar and wind systems with a total capacity of up to 30 kW inclusive are installed, when transmitting electricity to the grid.
- Simplifying the procedure for issuing permits for connecting to the grid for households, where solar and wind systems with a total capacity of up to 30 kW inclusive are installed, when transmitting electricity to the grid.

The PC members present at the NEURC unanimously supported the proposal of the Ukrainian Wind Energy Association regarding the introduction of a unified "green" tariff for combined sun and wind systems and decided to contact the Ministry of Regional Development, Construction and Housing of Ukraine regarding the drafting of relevant legislative documents to amend the **Law of Ukraine "On alternative energy sources":**

- In Article 1, to include the following definition "A combined system of private households is a combined electric system designed to generate electricity by converting the kinetic energy of wind and solar radiation into electrical energy."
- In Article 9,1 to add the following paragraph: "Green" tariff for private households that generate electricity using combined systems is set at the retail tariff level for consumers of the second tier of voltage as of January 2009 multiplied by the "green" tariff coefficient for the electricity generated from combined systems for private households".
- To elaborate on the issue of the value of a unified coefficient of the "green" tariff for the combined sun and wind systems, taking into account the suggestions from the market participants.

Draft Law "On amendments to the Law of Ukraine "On regulation of urban development" with regard to creating better investment opportunities in the sphere of generation of electricity from alternative energy sources".

On 19 December 2017, in the first reading, the Draft Law "On amendments to the Law of Ukraine "On regulation of urban development" with regard to creating better investment opportunities in the sphere of generation of electricity from alternative energy sources" *(the **"Draft Law"**)* was adopted. The Draft Law was developed by the State Agency on Energy Efficiency and Energy Conservation of Ukraine in order to overcome the problem of reserving capacities for connecting the power generating facilities that generate electricity using alternative energy sources.

The problem is that today many investors, having received specifications for connecting to the transmission system do not, for various reasons, complete construction of their facilities. According to Sergiy Savchuk, Head of the State Agency on Energy Efficiency and Energy Saving of Ukraine, "Currently, out of 4.5 GW of renewable energy generating facilities, which could be connected to the transmission system, 4.2 GW have already been reserved".

In particular, the Draft Law proposes to limit the period of validity of specifications for the electric power facilities generating electricity from alternative sources of energy, to three years from the date of issue.

It is also established that specifications issued prior to the enactment of this law remain valid for three years from the date of the enactment of this Draft Law.

It is possible that the provisions regarding the validity of specifications may still be adjusted in the Draft Law, taking into account the specifics and needs of electricity generation from different RES. The UWEA initiates extending the validity of new specifications from 3 years, as currently specified in the Draft Law, to 5 years. This is due to the fact that when installing WPPs, it is necessary to take into account the time for measuring wind potential and conducting ornithological research. It is also suggested that "in case of extending the validity of specifications up to 5 years, specifications issued more than two years prior to the enactment of this Law will be valid for 3 years from the date of enactment of this Law".

3.2. PUBLICATIONS

In spring 2017, **Wind Power Plants. Guidelines for the Development and Support of Wind Energy Projects,** prepared by the public union "Ukrainian Wind Energy Association" jointly with the public union "All-Ukrainian Energy Assembly", was pubished.

This publication is a continuation of the series of Standards of Organisation of Ukraine *(SOUs),* initiated by the PU All-Ukrainian Energy Assembly. The document, which was developed on the basis of the legislative framework in the area of wind energy in Ukraine as of 2016, defines technical and technological aspects in the operation of the country's wind energy enterprises. A special place in this publication is given to the section "Stages of implementation of projects for the construction of energy facilities that generate electricity using wind energy", which may be called a consistent scheme for the implementation of planning and construction of WPPs on the basis of legislative norms that are in force in Ukraine.

On 7 June 2017, a new report entitled **"Renewables 2017" developed by the global Renewable Energy Policy Network for the 21st Century *(the "REN21")*** was published. The REN21 report is the most comprehensive annual review of the global renewable energy sector.

In 2016, the total installed capacity of the world renewable energy sector increased by a record 161 GW, reaching almost 2 017 GW. The share of the solar power in the new facilities installed in 2016 is about 47%, the shares of the wind power and hydro power make 34% and 15.5%, respectively.

According to the report's authors, the need for "basic" generation for large-scale use of RES is a myth. Integration of large facilities of variable renewable generation into the energy grid can be achieved without the use of "basic" nuclear power and fossil fuel generation, if the energy system has sufficient flexibility, which can be achieved through the use of distributed generation, combined use of thermal and electric energy, as well as information and communication technologies, storage systems and heat pumps. Such flexibility not only balances up the variable generation, but also optimises the system and reduces the cost of generating electricity in general. Not surprisingly, the number of countries, which successfully manage the peaks and which are approaching or exceeding 100% of electricity generation from RES, is increasing. For example, in 2016, Denmark and Germany successfully managed peaks of the "green" generation, which reached 140% and 86.3%, respectively.

For the third year in a row, the UWEA is part of the expert group for drawing up the REN21 report; in particular, experts of the UWEA provide information on the development of the renewable energy sector in Ukraine.

On 24 October 2017, at the Ukrainian Crisis Media Center, the **report "Ukraine's Transition to Renewable Energy until 2050",** was presented, which demonstrats how Ukraine could switch to safe and modern energy based on 100% RES, and why this is more profitable for Ukraine than to continue its reliance on the traditional types of energy: coal, oil and nuclear power.

The work was performed by the Institute of Economics and Forecasting of the National Academy of Sciences of Ukraine with the support of the Representative Office of the Heinrich Böll Foundation in Ukraine in cooperation with public non-governmental organisations, state authorities, professional associations and independent experts. Experts from the Ukrainian Wind Energy Association made a significant contribution to the creation of a "roadmap" for the transition of the country's energy sector to 100% RES.

In the opinion of Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA, "The 100% RES is an ambitious but achievable goal for Ukraine. Much will depend on a stable legislative policy and the investment climate in the country."

3.3. COOPERATION WITH PROFESSIONAL STATE INSTITUTIONS AND ORGANISATIONS

On 23 January 2017, a meeting of the management of SE "NEC "Ukrenergo" with participants of the "green" electricity market took place. The Ukrainian Wind Energy Association was actively involved in preparing this event.

The event, held under the symbolic name of "Towards "Green" Energy", brought together representatives of all stakeholders: a system operator of the United Energy System of Ukraine, top managers of WPPs and SPPs and state authorities to NGOs, scientists, inventors and the expert media. The discussion was devoted to the following questions: how to maximise ease of access to Ukrenergo's transmission system for producers of "green" electricity, how to make information about the possibilities of Ukrenergo's transmission system most accessible, and what should be the content of such information, as well as what to do to improve forecasts on the generation of "green" electricity in Ukraine.

Vsevolod Kovalchuk, Acting Managing Director of SE "NEC "Ukrenergo", presented a package of Ukrenergo's initiatives for producers of "green" electricity, stating, "The new mechanisms for issuing specifications and approvals of the relevant feasibility studies will be as public as possible, quick and easy".

Mr. Kovalchuk presented several Ukrenergo's initiatives such as one-stop-shop, "green calculator" and a new interactive map of the Ukrenergo's transmission system.

During the meeting, participants of the "green" energy market gave their proposals on simplifying access to Ukrenergo's transmission system, improving the rules for working with investors and coordinating actions with professional associations. A separate presentation on forecasting electricity generation from RES was delivered by Oleksandr Charun, Manager of Wind Power, an UWEA member company, which operates the largest wind power plant in Ukraine.

The meeting participants appreciated the need for cooperation in the development of new system solutions that will help to effectively forecast and balance "green" generation.

In 2017, in Kyiv, within the framework of the technical assistance project "Ukrainian-Danish Energy Center" *(UDEC),* **workshops** were held **on wind power generation forecasting;** they were organized by the UWEA in cooperation with the UDEC. The first workshop on forecasting electricity generation at WPPs was held in Kyiv on 5 July 2017. On 26 September 2017, a second workshop on short-term forecasting of electricity generation using wind was held. Representatives of the UDEC, Danish Energy Agency, Ministry of Energy and Coal Industry of Ukraine and SE "NEC "Ukrenergo" attended the workshops. Companies that already have operating wind power plants as their assets represented the Ukrainian Wind Energy Association.

Gregor Giebel of the Technical University of Denmark *(DTU)* presented the demonstration program for forecasting wind power generation Prediktor, developed by scientists from the DTU, which was installed on the laptops of the workshop participants.

"The Law of Ukraine "On the electricity market of Ukraine", adopted last April, obliges electricity producers to incur financial responsibility for imbalances of electricity supplied to the electricity grid. At present, there is no system for the short-term forecasting of electricity generation at the RES facilities in Ukraine. Therefore, such workshops are extremely important for further development of the renewable energy sector in the country," Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA, said.

The prospect of development of Ukraine's wind energy sector for industrial wind power plants and low-capacity wind turbines for households were presented on 22 September 2017 by NGO "Ukrainian Wind Energy Association" at the **Production Meeting** of the **Joint Stock Bank Ukrgasbank,** during which trends in the development of the renewable energy sector in Ukraine and in the world were discussed.

Having become the first eco-bank in Ukraine, Ukrgasbank has been funding renewable energy projects since 2015 *(wind power projects that have already received funding: Novotroyitska WPP with a capacity of 70 MW (currently implemented by Vindkraft Tavria in Kherson Region), Prichernomorska WPP owned by Management Company "Wind Parks of Ukraine").*

In his speech at the Bank's Production Meeting, Carl Sturen, Director General of Vindkraft Ukraina LLC, shared the company's successful experience in the wind energy market and talked about the construction of the Novotroyitska WPP. After the commissioning of the latest stage, the Novotroyitska WPP will become one of the three largest generating renewable electricity facilities in Ukraine.

The successful development of wind energy depends ultimately on the investment climate in the country. It would be fair to call Ukrgasbank "the first ecological bank in Ukraine".

On 22 May 2017, in Hlukhiv, Sumy Region, at the initiative of the Glukhiv Oleksandr Dovzhenko National Pedagogical University and PU "Ukrainian Wind Energy Association", **the lecture-presentation "The EU and Ukraine's Experience in the Development of Wind Power Energy: Steps Toward the Future" was organised.** Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA, told students, young scientists and university teachers about current trends in wind energy development and the advantages of wind energy over technologies based on fossil fuel energy.

Volodymyr Lyubyvy, Assistant to the Rector of the Hlukhiv National Pedagogical University, said: "The transition to clean energy using renewable energy sources is very important for Ukraine, and future teachers and scientists should already be using the best world experience in this field in their work."

The event was held within the auspices of the Jean Monnet Module *(Erasmus +)* project "Implementation of the environmental safety strategy: integration of European experience".

From 14 to 16 November 2017, **a delegation from the Republic of Belarus** visited Ukraine to explore Ukraine's experience in renewable energy development in the framework of the international technical assistance project "Removing Barriers to Wind Energy Development in the Republic of Belarus". The Ukrainian Wind Energy Association hosted the visit from the Ukrainian side.

Department heads of the Ministry of Energy, Ministry of Natural Resources and Environmental Protection of the Republic of Belarus, representatives of Belenergo and regional councils visited one of the largest wind power plants in Europe – Botiyevska WPP – and two SPPs of Tokmak Solar Energy.

Belarusian experts held meetings with Olga Buslavets, Head of the Energy Complex Department at the Ministry of Energy and Coal Industry of Ukraine; Yuriy Shafarenko, Head of RES and Alternative Fuels Department at the State Agency on Energy Efficiency and Energy Saving of Ukraine; and Vitaliy Sevostyanov, Technical Director of the Management Company "Wind Parks of Ukraine". At the Botiyevska WPP a workshop "Monitoring of seasonal ornithological and natural complexes at the wind power plant. Case: Botiyevska WPP" was conducted by Valeriy Siokhin and Petro Gorlov *(the Ukrainian Scientific and Research Institute of Biodiversity).*

Marina Belous, Head of the "Elimination of barriers for the development of wind energy in the Republic of Belarus" program informed that, at

first, the project's participants focused on the European countries topping the list of wind energy countries – Denmark and Germany. "We went there and looked around. But very often you face the fact that it is difficult for professionals to talk to each other because of difference of initial conditions. At that time, when we tried to learn the experience of Western countries, we met the UWEA and realised that Ukraine is a country whose experience we must study first of all. Our conditions are very similar. The former Soviet Union had a unified energy system that was inherited by both Ukraine and Belarus. Ukraine has a developed nuclear power sector, and now we have started to develop nuclear energy in Belarus, too. We have been greatly impressed by your attention to such issues as environmental protection and environmental impact assessment. Connection to the grid, regulation and other issues that the Ukrainian energy sector is trying to solve today is a valuable experience for the Republic of Belarus. The absence of language barriers makes our cooperation even more valuable and meaningful for us", she said.

3.4. UWEA PARTICIPATION IN PROFESSIONAL EVENTS

WORKSHOPS ORGANISED BY THE UWEA

On 23 February 2017, in Kyiv, the workshop **"Technical and legal aspects of the implementation of wind power projects in Ukraine"** was held. The event was hosted by the Ukrainian Wind Energy Association and Dentons Law Firm; the general sponsor was Deutsche WindGuard.

The key issues discussed at the event included: technical management of a wind power plant, financing opportunities, legal and practical aspects of their implementation, current status of the industry and priorities for its development in 2017.

Leif Rehfeldt, Business Development Manager of Deutsche WindGuard, in his detailed presentation on the issues of technical management of WPPs, said, "Having actively worked on the wind power market of Ukraine for many years, Deutsche WindGuard sees significant potential for the introduction of independent and professional technical management for wind power projects in Ukraine". He highlighted the main aspects of technical management and cited examples of technical management at WPPs in Germany and China, emphasising the importance of professional technical management at WPPs as a safeguard for their successful operation.

"How the Ukrainian energy sector will look in the near future is being decided today. The introduction of "green" energy technologies, including the

construction of new WPPs, is a path to energy independence, economic development of the regions, and creation of new jobs," said Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA. "But the process of designing and constructing any power facilities should take place with strict observance of international rules. European experience shows that the optimal use of wind energy technologies may radically change the energy system toward the use of renewable energy."

The issues related to the successful implementation of the wind power projects, namely: studying the wind potential, forecasting electricity generation at wind power plants, and financing opportunities were discussed at the workshop "**The valuable experience in onshore wind energy",** organised by DNV GL and UWEA, which was held on 29 May 2017 in Kyiv.

In their presentations, representatives of DNV GL brought the attention of participants to the most common mistakes made by project developers during the designing, construction and operation of WPPs as well as the ways to prevent and resolve the problems.

"A proper wind monitoring helps to significantly reduce the error in forecasting the electricity generation at a wind farm. This allows us to secure financing for the project at better terms", advised Stanislav Gerasymenko, a representative of DNV GL.

Vyacheslav Molibog, a representative of Wind Power *(an operator of the largest wind power plant in Ukraine, Botiyevska WPP),* focused in his presentation on problems of short-term forecasting, which WPP operators in Ukraine are dealing with today. "To comply with the new requirement, we need time not only to develop an appropriate forecasting system, but also to determine the rules under which these forecasts are to be provided and evaluated," Vyacheslav Molibog emphasised.

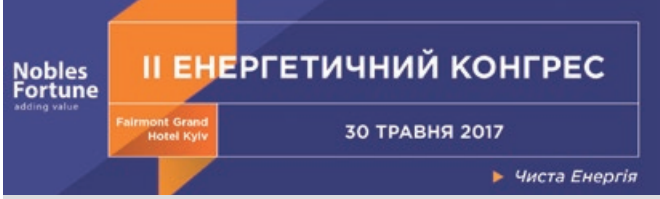
Webinars by DNV GL on short-term forecasting of electricity generation at WPPs. In July and October 2018, two webinars on short-term forecasting of electricity generation at WPPs were conducted by DNV GL at the initiative of its Polish office and the UWEA. Ayumi Suzuki, a specialist of the company's London office, gave a detailed presentation on short-term forecasting.

CONFERENCES WITH THE PARTICIPATION OF THE UWEA

On 26 May 2017, the conference **"Renewable energy and gas replacement. Implementation of energy service and energy management"** was held at the premises of the Lviv Regional State Administration.

When opening the conference, Sergiy Savchuk, Head of the State Agency on Energy Efficiency and Energy Saving of Ukraine, emphasised, "Implementation of energy efficiency and renewable energy projects is not only an opportunity to reduce and replace gas consumption. This is a path to social and economic strengthening of the entire region and the welfare of communities". Sergiy Savchuk explained that, for example, installing solid fuel boilers and wind power plants contributes to the revitalization of small and medium-sized businesses, creation of new jobs, and increase in budget revenues. "In addition, "green" projects will help to improve the environmental condition of cities, solve the problem of domestic waste."

During the conference, many presentations were focused primarily on the experience of using renewable energy sources in Denmark, issues of ESCO-contracts and energy management. In addition, the conference participants had the opportunity to learn about current trends in the development of wind energy globally and in Ukraine. That topic was addressed in their presentations by Andriy Konechenkov, Chairman of the UWEA, and Taras Fedak, Director of Development of Eco-Optima LLC.



DO WE NEED RENEWABLES?

82% **A.** Yes, we do. RES are environmentally sound resources, they attract investments in the national economy.

18% **B.** It's better to use fossil fuels. Renewables are expensive.

"Renewable energy is vital for Ukraine" – that is the result of the interactive voting by more than 300 delegates participating in the **II Energy Congress** held on 30 May in Kyiv; the event was organised by Nobles Fortune, with the Ukrainian Wind Energy Association as its general information partner.

Representatives of the global and Ukrainian energy community, leading market experts, investors, representatives of the European Commission and sectorial ministries spoke about the electricity market reform and the opportunities for increasing the share of renewable energy, as well as about the prospects of the future use of oil and gas.

The Draft New Energy Strategy of Ukraine for the period until 2035, entitled "Safety, Energy Efficiency, Competitiveness", was in the spotlight of the Congress participants. "The final draft of the New Energy Strategy of Ukraine for the period until 2035 is approved; its implementation opens a kind of visa-free energy regime for Ukraine," said Natalia Boyko, Deputy Minister on the European Integration of the Energy and Coal Industry of Ukraine, whose speech opened the discussion on the New Energy Strategy of Ukraine.

Issues related to the development of the national renewable energy sector were discussed during the session entitled "Opportunities of renewable energy. "Green Generation", which was moderated by Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA.

Many Congress delegates supported the idea expressed by Murat Durak, General Manager of ENERMET and Honorary President of the Turkish Wind Energy Association, "You cannot simply copy the European path of development of RES, you need 'to translate the best European experience into the Ukrainian language,' in other words, you need to develop your own approach on the basis of the European one".

Answering the question why wind power was so widespread in Germany, Joachim Fuhrländer, CEO of FLAIR Holding GmbH, Fuhrländer GmbH & Co KG replied, "It's very simple. It's cheap".

The II Energy Congress is the most relevant and influential event on the Ukrainian market for traditional and renewable energy, as well as energy efficiency.

Over 300 delegates from 39 countries took part in the **World Wind Energy Conference WWEC 2017 "Energy for Everyone",** which was held from 12 to 14 June 2017 in Malmö, Sweden. WWEC 2017 was hosted by the Swedish Wind Energy Association.

AT THE GENERAL ASSEMBLY OF THE WORLD WIND ENERGY ASSOCIATION, ANDRIY KONECHENKOV, CHAIRMAN OF THE UWEA, WAS RE-ELECTED AS THE VICE-PRESIDENT OF THE WORLD WIND ENERGY ASSOCIATION *(THE BOARD OF THE WWEA, IN ACCORDANCE WITH THE ASSOCIATION'S CHARTER, IS ELECTED EVERY TWO YEARS).*

Delegates paid special attention to the cooperative movement (association of local residents in wind energy cooperatives for the purpose of construction and operation of WPPs), which is gaining wide international popularity today.

The conference was addressed by Olafur Ragnar Grimsson, the 5th President of Iceland, Chairman of the international organisation "Arctic Circle" and Member of the Consulting Council SE4All *(Sustainable Energy for ALL);* Ibrahim Baylan, Minister of Energy of Sweden; Wu Gang, Chairman of Goldwind; representatives of the Swedish Energy Agency, US Department of Energy, Global 100% RE, global network REN21, International Hydropower Association, International Solar Energy Society, World Bioenergy Association and other international and national organisations.

The thesis that a "green" tariff and other state programs to support renewable energy are investments in the future, not subsidies in the "green" energy sector has been voiced in almost all speeches of the key conference speakers.

One of the signature events at WWEC 2017 was the statement by the Swedish Energy Minister that a switch to 100% RES "is necessary, feasible and beneficial for the society and that Sweden may reach this goal even well before the year 2040". The conference encouraged the Swedish government to take the necessary steps to achieve this target ahead of time and called on other governments to follow this example. The conference participants unanimously re-confirmed the significance of the Paris Accord on Climate Change for the entire world, as it paves the way for a 100% renewable energy future.

The Resolution unanimously adopted at the conference reflects the main goals and tasks the world community faces, including, in particular, "gradual removal of all energy subsidies and introduction of the internalization of all externalities", that is, to force producers of negative effects to pay for the external costs that arise due to their fault, and thus to compensate third parties for damages inflicted on them. It also means paying for external benefits, that is, paying compensation to producers of positive effects at the expense of their beneficiaries.

The Ukrainian Wind Energy Association actively participated in the preparation and work of WWEC 2017. "Ukraine, like most other countries that signed the Paris Accord, should make its own contribution to the development of the economy free from emissions of greenhouse gases polluting the atmosphere. The use of wind energy technologies for energy generation is a key tool in addressing this issue," noted Galyna Shmidt, Board Member of the UWEA.

From 9 to 11 October 2017, at the Parkovy Convention and Exhibition Center in Kyiv, the **9th Sustainable Energy Forum SEF 2017 KYIV was held.**

During the Forum, a special panel "Renaissance of the Ukrainian wind energy market, new features in wind project implementation" was held, where issues related to the main trends of wind energy development in Eastern Europe and Ukraine, opportunities for foreign companies in the Ukrainian wind energy market, as well as financing of wind power projects and associated risks were discussed. The panel was moderated by Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA.

On 25 October 2017, within the framework of the **XX International Oil & Gas Forum "Oil and Gas – 2017",** the panel discussion "Renewable energy development – wind power" was held.

The purpose was to discuss the pressing issues regarding the development of wind power projects within the framework of the New Strategy for Development of NJSC Naftogaz of Ukraine. Among the main speakers were Karl Sturen, Director General of Vindkraft Ukraine; Vladislav Yeremenko, Director General of Managing Company "Wind Parks of Ukraine"; Michal Glowacki, Operations Director of Nordex Polska Sp.z.oo; Gordan Pejic, Sales Director of GE Wind Energy GmbH in Eastern Europe; Lio Chiogi, Power China International Group Limited; Oleksandr Vlasenko, Advisor to the Chairman of the Board of JSB Ukrgasbank.

From 23 to 27 October 2017, in Kyiv, **the International Energy Forum "Open Energy Week"** was held, which brought together representatives of state and private companies of the fuel and energy industry, officials and Ukrainian MPs. The Forum was organised by the All-Ukrainian Energy Assembly.

When opening the Forum, the Head of the All-Ukrainian Energy Assembly and Forum moderator Ivan Plachkov said, "Today, it is important to have the experience and public expertise of the fuel and energy sector participants in the transition to new modern algorithms of interrelations, implementation of new energy legislation, in particular the Law "On the electricity market", in the issues of optimisation of tariff policy, sector reform in the context of the aspirations of independent Ukraine and integration of Ukraine's energy system with the European one".

The second session of the Forum was devoted to implementation issues of Energy Strategy of Ukraine and safeguards for its successful implementation. The speakers included Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA, and Vitaliy Sevostianov, Technical Director of the Management Company "Wind Parks of Ukraine".

"Today, we need to create a Green Investment Bank that could evaluate projects with RES, refine these projects and, most importantly, it should provide top-notch capital, at least 20% of equity capital. Then, the lending banks have a free hand to co-finance these projects," said Sergiy Savchuk, Head of the State Agency on Energy Efficiency and Energy Saving of Ukraine.

During the discussions conducted within the Open Energy Week, representatives of all sectors of the national energy industry shared their ideas, problems and success stories. Experts from the nuclear, coal and renewable energy sectors discussed the outlook for the future energy market in Ukraine.

During two days, from 26 to 27 October 2017, in Lviv, at the Lviv Arena, **XVII International Economic Forum "Lviv Region is the Driving Force Behind Ukraine's Industrial Revolution"** was held. The Forum was opened by Stepan Kubiv, First Vice Prime Minister of Ukraine; Oleg Sinyutka, Chairman of the Lviv Regional State Administration; and Oleksandr Hanushchyn, Chairman of Lviv Regional Council.

Within the framework of the Forum, a panel discussion was held on the development of renewable energy sources Ukraine and in Lviv Region; among its speakers were Shevka Adzhuner, Director of the EBRD in Ukraine, Maksym Kozitskyy, CEO of ECO Optima, Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA and Murat Deligoz, Vice-President of Enisolar Energy AS.

Maksym Kozitskyy presented a new wind power plant of Eco Optima Group – Staryi Sambir-2 – which was officially opened in Staryi Sambir District of Lviv Region on 26 October 2017, and shared the

company's further plans. "In the coming years, the company plans to invest approximately 25 billion UAH in the renewable energy sector. In particular, it is planned to build two more solar and wind power plants. On 26 October, within the Forum framework, a Framework Agreement was signed with our partners – VR Capital and AVEERAM" –on the implementation of the Orivska (Skolivska) wind power plant with a total installed capacity of 50 MW."

"Over the past years, the interest of foreign investors in Ukraine's wind energy market has increased significantly. It is very important that the adoption of any legislative solutions regarding RES would take place in a balanced way taking into account the national interests. Any changes in legislation have a negative effect on the investment climate", noted Andriy Konechenkov.

The investment forum "Tavria Horizons: Cooperation, Investment, Economic Development", held in Nova Kakhovka on 29 October 2017, gathered more than 750 participants, including representatives of major domestic and foreign investment companies, government officials, representatives of the diplomatic corps, international financial and donor organisations, experts in the field of economic development and investment, NGOs and scientists, who took part in discussions on economic and investment development of Kherson Region.

The concept of this year's event was devoted to the prospects of the "green economy" development in Ukraine, as well as to the possibilities opening up in the Kherson Region for the implementation of "green" projects.

The program of Forum included a panel discussion "Prospects for the development of electricity production in Ukraine through renewable sources" initiated by Kherson Regional State Administration, the Vindkraft Group of Companies, and the Ukrainian Wind Energy Association. After discussion of the prospects for the development of, and investment in, renewable energy projects, the ceremony opening the first stage of the Novotroyitska WPP was held.

From 1 to 2 November 2017, in Ankara, **the 6th Turkish Wind Energy Congress hosted by the Turkish Wind Energy Association *(TWEA)* was held.**

The Congress entitled "More Local More Renewable" brought together over 2,000 delegates representing state and private sectors of the wind energy industry, leading wind turbine manufactures, international wind energy experts and scientists.

Welcoming remarks were made by Mustafa Serdar Ataseven, President of the Turkish Wind Energy Association; Dr. Berat Albayrak, Minister of Energy

and National Resources; Giles Dickson, CEO of WindEurope; Steve Sawyer, General Secretary of Global Wind Energy Council; Mustafa Yilmaz, President of the Turkish Energy Market Regulator *(EMRA);* and Cihan Pektas, President of the Environmental Commission of the Grand National Assembly of Turkey.

Andriy Konechenkov, Chairman of the UWEA, speaking at the session on global wind investments, presented wind energy development in Ukraine and emphasised the importance of cooperation between Ukrainian and Turkish wind power producers.

Mustafa Serdar Ataseven, President of the Turkish Wind Energy Association, noted in his interview with the UWEA, "We are very pleased to welcome the Ukrainian Wind Energy Association at our 6th Turkish Wind Energy Congress. As you know this year we are celebrating the 25th anniversary of the

Turkish Wind Energy Association. The wind energy industry is developing very rapidly in Turkey. Now in the country we have 7 plants producing towers; 4 plants making blades; 2 plants producing gear boxes; and 2 plants making generators. In his address, our Minister of Energy and Natural Resources Dr. Berat Albayrak announced that a tender for 2 000 MW of new wind power capacities will complete by the end of this year".

On 22 November 2017, at the Chamber of Commerce and Industry of Ukraine, in Kyiv, **the Sixth professional electrotechnical conference "Systems of Guaranteed Electricity Supply and Automation 2017"** organised by the journal "Networks & Business" was held.

The annual autumn conference on systems of guaranteed power supply and automation paid special attention to the issues of renewable energy, lightning protection, guaranteed power supply for data centres and fire safety.

Within the framework of the plenary session, Andriy Konechenkov, Chairman of the UWEA and Vice-President of the WWEA, delivered a report on the business climate on the wind energy market in Ukraine. He spoke about the achievements and peculiarities of the development of wind energy globally and in Ukraine, drawing attention to the high rates of construction of WPPs and SPPs, in particular, in China and third world countries.

Volodymyr Sklyar, Editor-in-Chief of "Networks & Business" presented the status and brief historical background on the Ukrainian segment of solar energy.

For three days, from 28 to 30 November 2017, Amsterdam became the global epicentre for wind energy as thousands of experts were engaged in discussions, knowledge exchange and debate focused on further success in Europe's wind energy industry in the course of the annual conference **WindEurope 2017.**

During the conference, the attention of participants was focused on issues related to the impact of the wind energy industry on the local economy and communities, how this impact contributes to Europe's global leadership in wind energy industry, and what serious obstacles the European wind energy industry could deal with in the post-2020 environment. In addition, there were discussions on EU legislative initiatives in the field of RES – Clean Energy Package – issues related to benefits, opportunities and energy storage, the role of digitalisation in the integration of the wind energy industry, and Corporate Renewable PPAs.

In his opening address to the WindEurope 2017 conference and exhibition, Ivor Catto, Chairman of WindEurope, as well as Executive Director of RES Group, called on member states to set a renewable energy target of 35% by 2020, which, according to WindEurope, would result in the growth of installed wind power capacity to 323 GW.

The member states should also give a three-year vision of RES development, where they should specify long-term budgets and market size to give developers more time for planning their activities. "With clear vision, comes cost-effective development and a lower cost to the consumer," Catto said. Besides, it is necessary to retain priority purchases of energy produced from RES, especially for existing projects. Finally, according to Catto, transmission networks should embrace technologies that provide grid balancing.

WITHIN THE FRAMEWORK OF THE CONFERENCE, A MEMORANDUM OF COOPERATION AND PARTNERSHIP WAS SIGNED BETWEEN THE UKRAINIAN WIND ENERGY ASSOCIATION AND THE TURKISH WIND ENERGY ASSOCIATION.

3.5. GROWING PARTNERSHIP

IN 2017, THE UWEA ACTIVELY COOPERATED WITH STATE INSTITUTIONS AS WELL AS NATIONAL AND FOREIGN PROFESSIONAL ASSOCIATIONS. A NUMBER OF MEMORANDUMS OF PARTNERSHIP AND COOPERATION WERE SIGNED WITH THE PURPOSE OF EXPANDING PARTNERSHIP AIMED AT DEVELOPING A BALANCED ENERGY SECTOR OF UKRAINIAN ECONOMY.

MEMORANDUM ON PARTNERSHIP AND COOPERATION WITH UKRGASBANK

On 26 April 2017, the Memorandum of Partnership and Cooperation was signed between NGO Ukrainian Wind Energy Association and PJSC JOINT STOCK BANK UKRGASBANK.

In May 2016, the International Finance Corporation and Ukrgasbank signed a Cooperation Agreement aimed at facilitating access to funding for companies willing to introduce renewable and energy saving technologies. Since the start of the joint project with IFC, Ukrgasbank has already implemented around 20 "green" energy projects with a total installed capacity of 115 MW.

Under the Memorandum, it is planned to conduct joint information campaigns and implement joint projects on energy efficiency and "green" energy.

АСОЦІАЦІЯ ОПЕРАТОРІВ РОЗПОДІЛЬЧИХ ЕЛЕКТРИЧНИХ МЕРЕЖ

MEMORANDUM ON PARTNERSHIP AND COOPERATION WITH ADSO

The Memorandum on Partnership and Cooperation between NGO Association of Distribution System Operators and NGO Ukrainian Wind Energy Association was signed on 7 June 2017. The associations intend to focus their efforts on effective cooperation for the development of a balanced energy sector in Ukraine, taking into account the large-scale development of "green" electricity.

Today, the Association of Distribution System Operators (electricity) of Ukraine unites 13 regional power distribution companies: PrJC Enterprise for the Operation of Electric Networks 'Central Energy Company', Luhansk Energy Association LLC, as well as eleven regional energy supply companies *(oblenergos) (Kyiv, Kirovograd, Rivne, Odessa, Zhytomyr, Vinnitsa, Sumy, Chernihiv, Kherson, Chernivtsi and Dnipropetrovsk Regions).* The annual volume of distributed electricity is up to 40 billion kWh; the total length of distribution networks exceeds 400,000 km. Enterprises united by the Association employ more than 40,000 staff.

MEMORANDUM ON PARTNERSHIP AND COOPERATION WITH THE INSTITUTE OF RENEWABLE ENERGY OF THE NAS OF UKRAINE

On 20 June 2017, the Institute of Renewable Energy of the National Academy of Sciences of Ukraine and the Ukrainian Wind Energy Association signed a Memorandum on Partnership and Cooper-

ation. The organisations plan to promote practices and experience of using renewable energy sources *(RES)* in the energy industry and the development of national manufacture of equipment.

The main area of work of the IRE of the NAS of Ukraine is fundamental and applied research – creation of integrated energy supply systems based on renewable energy sources: wind, solar, hydro, geothermal resources and renewable organic energy sources.

MEMORANDUM ON PARTNERSHIP AND COOPERATION WITH THE SFII

On 6 October 2017, the State Finance Institution for Innovations *(SFII)* and the NGO Ukrainian Wind Energy Association signed the Memorandum of Partnership and Cooperation, which identified the main objectives of cooperation, in particular, the promotion of investments in the Ukrainian wind energy sector, the dissemination of practices and experience in the use of renewable sources energy in the electrical energy industry, and the development of national production of related equipment.

The State Finance Institution for Innovations (SFII) was established according to the resolution of the Cabinet of Ministers of Ukraine, dated 13 April 2000. The SFII's founder is the state represented by the Cabinet of Ministers of Ukraine. The institution is managed by the Ministry of Economic Development and Trade of Ukraine and has several regional offices. The SFII's purpose is to provide financial support to business entities of various ownership forms within the framework of state innovation policy.

MEMORANDUM ON PARTNERSHIP AND COOPERATION WITH THE TWEA

On 28 November 2017, within the framework of the international conference and exhibition WindEurope 2017 held in Amsterdam, Netherlands, PU Ukrainian Wind Energy Association and the Turkish Wind Energy Association *(TWEA)* signed the Memorandum on Partnership and Cooperation.

In the course of signing the Memorandum, the first working meeting between representatives of the UWEA and TWEA was held, during which representatives of the wind energy sectors of Ukraine and Turkey discussed possibilities of cooperation aimed at the large-scale implementation of wind energy technologies and further successful development of the sector.

The Memorandum's objective is mutually beneficial partnership and cooperation between the associations in the field of wind energy to promote the transition to low carbon economies.

The UWEA and TWEA will direct their efforts toward effective cooperation in the exchange of knowledge and experience accumulated in the use of wind energy technologies and national manufacturing of wind power equipment.

According to the performance in 2016, the total installed capacity of wind power in Turkey was 6 106 MW. Over the past 5 years, the wind energy industry has demonstrated high growth rates – at the level of 27-29%. In 2016 alone, 1 387.75 MW of the new wind power capacities were commissioned. Similar results are expected for 2017 (the exact data will be released early in 2018).

According to Andriy Konechenkov, Chairman of the UWEA, "the high rates of wind energy development in Turkey show excellent results of wind energy's integration in the national energy system".

MEMORANDUM WITH MELITOPOL STATE PEDAGOGICAL UNIVERSITY, HLUKHIV NATIONAL PEDAGOGICAL UNIVERSITY, AND HLUKHIV AND KROVELETS DISTRICT COUNCILS

On 22 December 2017, on the Ukrainian Energy Worker Day, NGO Ukrainian Wind Energy Association signed the multilateral Memorandum with the Melitopol-based Bohdan Khmelnytsky State Pedagogical University, Hlukhiv Oleksandr Dovzhenko National Pedagogical University, as well as with the Hlukhiv and Krolevets District Councils to promote the development of renewable *(alternative)* energy sources and implementation of the EU ecological security strategy.

The purpose of the cooperation between the parties signing the Memorandum is to create proper conditions for studying the experience of organising systematic research in the field of complex safety of wind power, to introduce a strategic approach to monitoring seasonal ornithological complexes and transcontinental migrations of birds, natural complexes and other ecological safety measures within the prospective sites for WPPs over the period of all technological stages – from design to construction and operation of wind power parks in Ukraine.

MEMORANDUM ON PARTNERSHIP AND COOPERATION BETWEEN NATIONAL UNIVERSITY OF WATER MANAGEMENT AND NATURE RESOURCES USE AND UWEA

Memorandum on Partnership and Cooperation between the National University of Water Management and Nature Resources Use and the NGO Ukrainian Wind Energy Association, signed on 29 December 2017, focuses on the promotion and large-scale implementation of RES and energy saving technologies, as well as alternative fuels in the energy sector of Ukraine. Within the framework of the Memorandum, the parties plan to organise and jointly participate in national and international events on the use of RES, environmental protection, etc. An important part of the cooperation is also information exchange on the creation of a favourable investment climate in the field of renewable energy of Ukraine, actual and problematic issues on the implementation of energy saving technologies and generation of electricity from RES and joint search for ways to resolve them.

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UWEA

Ukrainian Wind Energy Agency is your reliable information partner in the global wind industry

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COMMITTEE OF VERKHOVNA RADA OF UKRAINE ON FUEL AND ENERGY COMPLEX, NUCLEAR POLICY AND NUCLEAR SAFETY

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