UWEA
UKRAINIAN
WIND ENERGY
ASSOCIATION

UKRAINIAN WIND POWER SECTOR

2016

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 2016

MARKET OVERVIEW

Ukrainian Wind Market Overview 2016 has been prepared by Public Union UKRAINIAN WIND ENERGY ASSOCIATION *(UWEA)* in cooperation with Law Firm SAYENKO KHARENKO

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

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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.

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

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

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CONTENT

ACRONYMS AND ABBREVIATIONS

CHP	Combined Heat and Power
COP 21	the 2015 United Nations Climate Change Conference
GWh	Gigawatt-hour
HPP	Hydro Power Plant
IRENA	The International Renewable Energy Agency
kW	Kilowatt
kWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt-hour
NEC	National Energy Company
NEURC	the National Energy and Utilities Regulatory Commission of Ukraine
NGO	Non Governmental Organisation
NPP	Nuclear Power Plant
Paris Agreement	Agreement within the United Nations Framework Convention on Climate Change dealing with greenhouse gases emissions mitigation adopted in Paris in 2015
PSPP	Pumped Hydroelectric Energy Storage
PV	Photovoltaic
RE	Renewable Energy
RES	Renewable Energy Source
SE	State Enterprise
SHPP	Small Hydro Power Plant
SAEE	the State Agency on Energy Efficiency and Energy Saving of Ukraine
TPP	Thermal Power Plant
UES	United Energy System
WPP	Wind Power Plant
WTG	Wind Turbine Generator

I. WIND POWER SECTOR OF UKRAINE

1 KEY FIGURES AND FACTS

Figure 1. *The dynamics of the wind power sector, mainland Ukraine, 2009-2016*

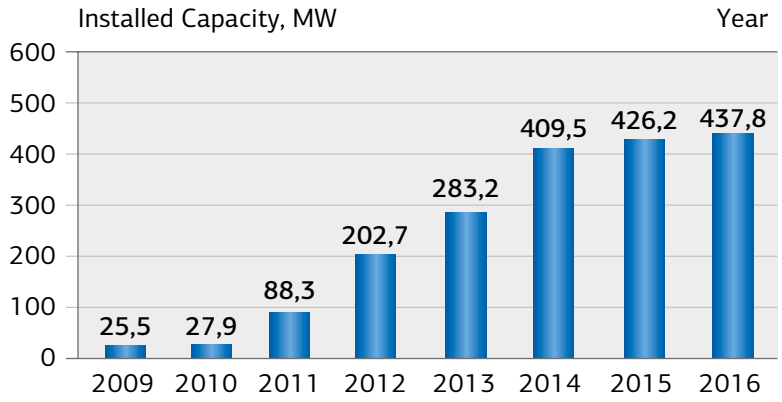
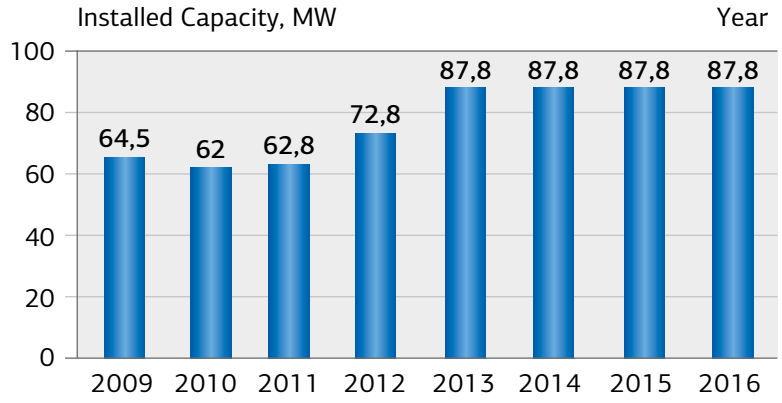


Figure 2. *The dynamics of the wind power sector, Crimea, 2009-2016*



Year 2016 can be characterized as a year of promising hopes given the last year developments in the wind energy sector of Ukraine. Despite a slow progress in new capacity additions, interest of international financial institutions in the Ukrainian wind market has become more prominent.

After 126,5 MW in 2014 and record 276 MW in 2012, the past year was decidedly not marked by bright results. Only **11,6 MW** were added to the Ukrainian onshore wind parks in 2016.

Thus, as of 31 December 2016, the cumulative capacity of the wind power sector of Ukraine reached 525,6 MW including **437,8 MW** in the mainland Ukraine. Russian annexation of the Crimea stopped wind development in the AR Crimea; total installed wind capacity of the Crimean wind power plants has remained unchanged since 2013 and frozen at 87,8 MW.

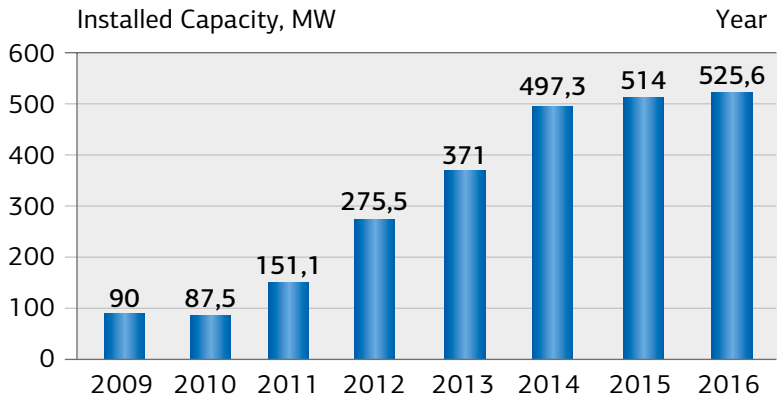
In 2016 all wind power plants located in the mainland Ukraine generated **1 047,086 million kWh** of electricity, including **924,483 million kWh** of electricity supplied under "green" tariffs. Delivery of electricity generated by the solar and wind power plants located in the annexed territory of the Crimea to the United Energy System of Ukraine has been stopped since April 2014.

In 2016 "green" electricity generated from wind saved more than **775 000 ton of CO_2 emission,** wind produced enough electricity for about 260 thousand typical Ukrainian homes with average monthly consumption of 400 kWh of electricity.

About **500** wind-related jobs have been created in Ukraine by the end of 2016, including **269** professionals working directly in wind companies.

The UWEA in cooperation with Wind Power conducted a special survey "Gender Policy in the Renewable Energy Sector of Ukraine". According to its results, the share of women employed by the wind developing companies in Ukraine reaches 77,5%. Interestingly that the average age of working women is 31-40.

Figure 3. *The dynamics of the wind power sector, mainland Ukraine and Crimea, 2009-2016*



For the last six months of 2016 wind market of Ukraine experienced a gradual recovery after a year of stagnation in 2015. Foreign investors particularly from such countries as Germany, Poland, Lithuania, Turkey and China demonstrated a significant interest in the wind projects in Ukraine. They actively investigated the market and announced their plans on wind development in Ukraine.

Due to a revival of foreign investors' interest in RE projects in Ukraine and for all stakeholders better understanding the national RE market by, SAEE initiated an interactive investment map of Ukraine UAMAP. The map contain detailed information about energy efficiency and renewable energy projects, implemented in the past, current and prospective projects, which require investments. The UWEA is a partner of this project.

2 UKRAINIAN ELECTRICITY INDUSTRY

The electricity output and the annual capacity additions are the key electricity industry indicators.

According to the Ministry of Energy and Coal Industry of Ukraine, production of electricity in the United energy system of Ukraine in 2016 decreased by 1,8% *(2,848 billion kWh)* compared to 2015 year.

The share of NPPs in the structure of electricity production was 52.3% *(in 2015 – 55,6%),* and TPPs – 36,6% *(35,2%),* hydro and pumped storage – 5.9% *(4,3%),* municipal CHP and block-stations – 4,2% *(3,9%),* renewable energy sources – 1,1% *(1%).*

Nuclear power plants last year reduced the generation of electricity by 7,6% to 80,95 billion kWh. Thermal power plants and combined heat and power plants *(CHP)* increased their production by 2,1% – up to 56 billion 611,6 million kWh. Hydropower plants *(HPP and PSPP)* in 2016 production increased by 33,9% to 9 billion 118,8 million kWh, municipal CHP and block-stations – by 6,5%, to 6 billion 576,8 million kWh.

During the same period electricity production from renewable energy sources *(wind farms, PV, biomass)* increased by 11,5% to 1 775 million kWh.

It should be noted that wind power plants output in 2016 decreased by 7% compared to 2015. Two factors have been the major causes of such declining. Firstly, three wind farms located in the temporarily occupied territory of the Eastern part of Ukraine, were not in position to deliver electricity to the UES of Ukraine; therefore they generated a small amount of electricity just to maintain equipment in working condition. Electricity generated by these three WPPs has not been included in the total wind electricity production in 2016.

Secondly, there were less windy days in the Eastern Europe in the first half of a year compared to the same period of 2015. At the same time the average annual capacity factor of some wind power plants located in south of Ukraine reached 42%.

Table 1. *Electricity generation in Ukraine in 2015-2016, by sources of energy*

POWER PLANT	2015 pік		2016 pік	
	Electricity Generation mln kWh	Share in total electricity generation, %	Electricity Generation mln kWh	Share in total electricity generation, %
TPP, CHP	55 461,7	35,2	56 611,6	36,5
NPP	87 627,5	55,6	80 950,0	52,3
HPP, PSPP including HPP	6 808,5 5 234,9 1 573,6	4,3 3,3 1	9 118,8 7 484,8 1 634,0	5,9 4,8 1,1
RES *(WPP, PV, biomass)*	1 591,1	1	1 775,0	1,1
Block-station, others	6 176,4	3,9	6 576,8	4,2
Totally	**157 665,2**	**100**	**155 032,2**	**100**

Source: Ministry of Energy and Coal Industry of Ukraine, 2016

Table 2. *Structure of power generation, mainland Ukraine, 2014-2016*

POWER PLANT	Installed Capacity December 31.2014	Installed Capacity December 31.2015	Installed Capacity December 31.2016
Totally, MW including:	**54 643**	**55 468**	50 627
HPP	27 700	27 723	27 803
CHP, block-station	6 443	6 541	6 541
HPP	4 668	4 692	4 692
PSPP	1 186	1 510	1 510
AEC	13 835	13 835	13 835
RES *(WPP, Biomass)*	811	1 168	1 117

3 RENEWABLE POWER SECTOR

Renewable energy development is important for the Ukrainian power industry: energy security, environmental safety and new generating capacities. Renewable energy is a solution for the technological leadership of the country

The twenty-first UN Conference on Climate, held in December 2015 in Paris, identified Renewable Energy as the main instrument for reducing greenhouse gas emissions and harmful effects of the climate change.

1 775 million kWh of electricity was generated from renewable sources in Ukraine in 2016 which is 183,9 million kWh more then in previous year. Renewable electricity saved about **1 million 315 thousand ton** of CO_2 emission. The RES share in total electricity generation in Ukraine reached 1% in 2016.

In terms of total electricity production wind energy was the most effective sources of clean generation in 2016. All wind turbines produced

Figure 4. *Structure of renewable power generation facilities, mainland Ukraine, MW, 2016*

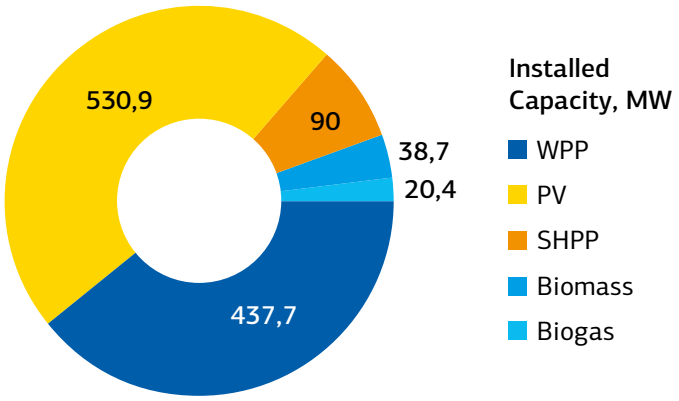
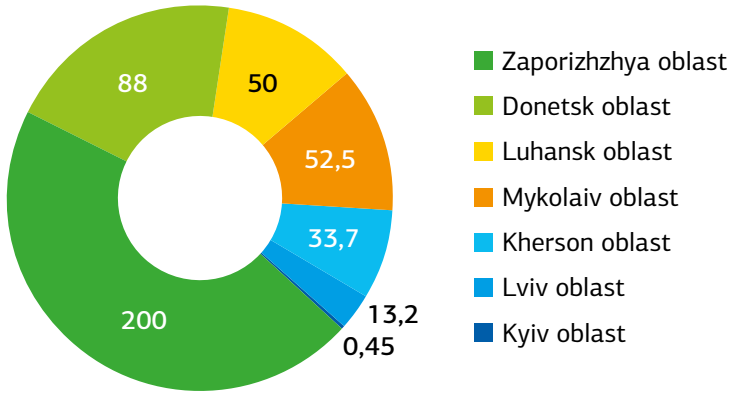


Figure 5. *Installed wind power capacity, by oblasts of Ukraine*



1 047,086 million kWh of "green" electricity *(including* ***924,483 million kWh*** *of electricity supplied under "green" tariffs)* which made up around 51.52% of the annual electricity production from RES.

The cumulative installed capacity of the wind power plants located in the mainland Ukraine reached 437,8 MW or 0,8 % of total installed power generation capacity in the mainland Ukraine.

Last year wind produced enough electricity for about 260 thousand typical Ukrainian homes with average monthly electricity consumption of 400 kWh.

In 2016 PV delivered 492,154 million kWh of electricity; SHPP generated 189,330 million kWh, while biomass generators increased their production to 80,379 million kWh and 88,610 million kWh of electricity was generated from biogas.

While in 2015 total renewable power generation capacity rose hardly by 30 MW, in 2016 the annual renewable power capacity growth reached 120,649 MW totaling **1 117,692 MW** by the end of 2016 *(997.04 MW in 2015).*

Ukraine posses excellent wind power resources to ensure the development of large wind projects. The southern coast of Ukraine, the Carpathians have the best wind potential in the country. Naturally, the wind development has covered, above all, areas located in the above mentioned regions. Currently, Zaporizhzhya oblast *(region)* with 200 MW installed across the region, is a leader among other Ukrainian oblasts in terms of total installed wind capacity.

Table 3. *Installed capacity of utilities that supply electricity under "green" tariff*

POWER PLANT	Installed Capacity, MW		Added in 2016, MW
	31.12.2015	31.12.2016	
WPP	426,125	437,725	11,6
PV	431,743	530,887	99,144
SHPP	86,735	90,02	3,285
Biomass	35,2	38,7	3,5
Biogas	17,24	20,36	3,12
TOTAL	**997,043**	**1 117,692**	**120,649**

4 RENEWABLE POWER SECTOR AND ENERGY REFORMS IN UKRAINE

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC *(Article 338, Association Agreement)* creates a common set of rules for the use of renewable energy.

The document provides for mandatory renewable energy targets based on individual countries' national statistics and potential. With the adoption of Directive 2009/28/EC, Ukraine committed to a binding 11% target of energy from renewable sources in gross final energy consumption in 2020.

Despite the need for Ukraine to reach 11% share of RES by 2020, the renewable energy development process is extremely slow. Thus, in the first 6 months of 2016 only 55 RES power plants totaling 120,65 MW were commissioned in Ukraine out of which 99,1 MW – PV plants, while 130 million euros were invested in the sector. Last year only 11,6 MW of wind were put online.

The enactment of the Law "On Alternative Energy Sources" as Regards Including Heat Pumps in the List of Equipment Operating on Renewable Energy Sources" was another important step towards implementation of the Association agreement with European Union in areas of energy and environment. The draft law, in particular, provides for the inclusion of aerothermal, geothermal and hydrothermal energy in the list of alternative energy sources.

Ukraine was among the first 20 countries *(including three European countries)* that ratified the Paris Agreement to date. In July, the Parliament adopted the Law No. 0105 "On Ratification of the Paris Climate Change Agreement" that was subsequently signed by President Petro Poroshenko. According to the Minister of Ecology Mr. Semerak, by ratifying the Agreement, Ukraine confirmed that it chose low-carbon model of the national economy development.

On 10 May President Petro Poroshenko signed a Decree No. 200/2016 "The issues of Ukraine's accession to the Statute of the International Renewable Energy Agency *(IRENA)*", in which he authorized Chairman of the State Agency for Energy Efficiency and Energy Saving of Ukraine to submit an application on joining the IRENA *(Please refer to section "Changes in Legislation" for more details).*

5 COST OF ELECTRICITY GENERATED FROM WIND

The share of RES in the total volume of electricity bought by SE Energorynok in 2016 accounted for 1,26%, most of which were delivered by the WPPs.

It should be noted that **the wind is the cheapest renewable energy source to produce electricity in Ukraine.**

The below Table 5 clearly proves it. According to SE Energyrynok, the share of electricity generated from wind in the cost of electricity bought at the wholesale electricity market in Ukraine is just 2,54% *(share of wind in the volume of electricity generated accounted for 0,66%),* which is less than shares of electricity generated by PV and SHPP though their shares in the volume of electricity delivered were 0,35% and 0,13% respectively.

Table 4. *Electricity production from RES in 2016*

RES	Electricity, MWh
WPP	924,483
PV	492,604
SHPP	189,330
Biomass	80,379
Biogas	88,160
TOTAL	**1774,956**

Figure 6. *"Green" generation in 2016 per RES, million kWh*

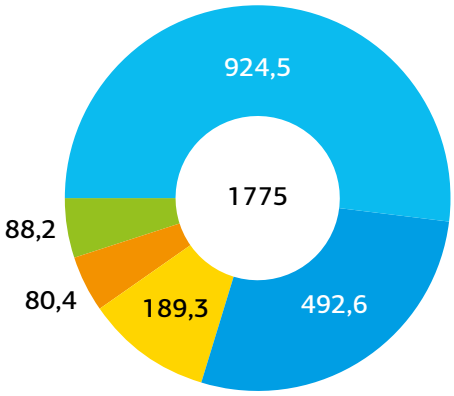


Table 5. *Share of primary energy sources in electricity generation and cost in Ukraine in 2016*

ENERGY SOURCE	Share in electricity generation	Share in electricity cost
NPP	53,74%	29,32%
THPP	31,78%	45,96%
HPP *(SPHH excluded)*	6,21%	5,23%
CHP	7,01%	12,51%
SHPP	0,13%	0,56%
WPP	0,66%	2,54%
PV	0,35%	3,38%
Biomass	0,06%	0,24%
Other	0,06%	0,26%
TOTAL	**100,00%**	**100,00%**

6 NATIONAL WIND PROJECTS IN UKRAINE

Ukrainian wind capacity reached 437,8 MW by the end of December 2016, out of which 11,6 MW were added in the last three months of 2016: 6,6 MW were commissioned by company Eko-Optima in Lviv oblast and 5 MW – by MC Wind Parks of Ukraine in Mykolaiv oblast. All Ukrainian wind power plants are grid connected.

In 2016 all wind power plants located in the mainland Ukraine supplied **924,483 million kWh** of electricity under "green" tariff. Delivery of electricity generated by the solar and wind power plants located in the annexed territory of the Crimea to the United Energy System of Ukraine has been stopped since April 2014.

At the end of 2016 12 wind power plants operated in the country. The largest Ukrainian wind power farm is 200 MW Botievska WPP located in Zaporizhzhya.

Table 6. *Wind power plants located in the mainland Ukraine*

#/ #	WIND POWER PLANT	Total Installed Capacity 31 Dec. 2015, MW	Commissioned in 2016, MW	Total Installed Capacity 31 Dec. 2016, MW
1	Botievska WPP	199,875	0	199,875
2	Wind Park Novoazovskiy	57,5	0	57,5
3	Ochakivska WPP	47,5	5,0	52,5
4	Wind Park Lutuginskiy	25,0	0	25,0
5	Wind Park Krasnodonskiy	25,0	0	25,0
6	Novoazovska WPP	30.53	0	30,53
7	Novorosiyska WPP	9,225	0	9,225
8	WPP Stavky	9,225	0	9,225
9	Beregova WPP	12,3	0	12,3
10	Syvaska WPP	2,92	0	2,92
11	Staryi Sambir 1	6,6	6,6	13,2
12	Legena LLC	0,45	0	0,45
	TOTAL:	**426,125**	**11,6**	**437,725**

7 NEW WIND CAPACITY ADDITIONS IN 2016

Ukrainian wind company Eko-Optima commissioned the second stage of its 13,2 MW Stryi Sambir-1 wind power plant in Lviv oblast on 7 October 2016. For the time being the first Ukrainian wind power plant comprises 4 wind turbines Vestas V 112 with unit capacity of 3,3 MW. The wind power plant is expected to produce approx. 36,0 million kWh of clean electricity per year

The wind project **Staryi Sambir-1** was implemented by Ukrainian company Eko-Optima jointly with the European Bank for Reconstruction and Clean Technology Fund. In the coming years the company plans to construct some more wind power plants including WPP Staryi Sambir-2, WPP Skolivska and wind park Sokalskiy.

On 20 December 2016 **Prychornomorskiy wind park,** which is a part of the Ochakovska WPP was officially commissioned in the Mykolaiv oblast of Ukraine. Prychornomorskiy wind park is located

Table 7. *Models of wind turbines installed in Ukraine*

MODEL	NUMBER OF WTGs	UNIT CAPACITY
MAINLAND UKRAINE		
Vestas V112	4	3,3 MW
Vestas V112	75	3,075 MW
FWT FL2500	66	2,5 MW
Turbowinds T600-48	8	0,6 MW
USW56-100	220	0,1075 MW
Bonus	1	0,45 MW
Total	**374**	**437,8 MW**
CRIMEA		
FWT FL2500	10	2,5 MW
Unison 2,0	2	2,0 MW
Turbowinds T600-48	14	0,6 MW
USW56-100	469	0,1075 MW
Total	**495**	**87,8 MW**

in the village Dmytrivka in Mykolaiv oblast. As of this writing it comprises 2 wind turbines WTU 2500 with unit capacity of 2,5 MW. Several more Ukrainian-produced wind turbines of 3+ MW each are planned for installation in 2017.

Prychornomorskiy wind park is the first RE generating facility in Ukraine that has received a 10% premium to the "green" tariff prescribed by the current legislation for the use of the equipment of Ukrainian origin at a power plant. Wind turbines were produced by Fuhrlaender Wind Technology LLC, a Ukrainian manufacturer of wind power equipment, in cooperation with six Ukrainian largest machine-building plants such as Kramatorsk Heavy Machine Tool Plant, PJSC "Novokramatorsky Machine Building Plant", PJSC "Energomashspetsstal" and other.

Almost all wind capacities of the mainland Ukraine are presented by wind turbines with unit capacity of 2,5 MW and 3+ MW.

The share of Vestas produced wind turbines V 112 accounts for almost 55,7% *(or 243,4 MW)* while the share of FWT produced wind turbines FWT 2500-100 *(since 2016 – WTU)* reaches 36% *(165 MW)*.

8 RESUMPTION OF FUNDING FOR WIND PROJECTS

After a sluggish development of the wind energy sector in Ukraine in the last two years caused by the suspension of funding of new projects by international financial institutions because of the military operations in the East of Ukraine and the annexation of the Crimea, The UWEA expects better developments in 2017.

On 17 May, the International Finance Corporation and Ukrgazbank signed a Cooperation Agreement aimed at facilitating access to finance for companies willing to introduce renewable energy and energy saving technologies. The announced project is a part of the IFC's Sustainable Energy Finance Program in Ukraine. It will help increasing the volume of loans granted to small and medium business for RES, green vehicles, energy saving, efficient use of water resources and waste treatment. At the same time, "green" loans become more accessible for small and medium business since Ukrgazbank decided to reduce interest rates for environmental projects lending: from 24% to 20,5% in UAH, from 10% to 7,7% in USD and from 9% to 6,7% in EUR.

A loan agreement aimed at establishing a wind farm close to the city of Staryi Sambir in the Lviv oblast in the western Ukraine was signed by Nordic Environment Finance Corporation and the European Bank for Reconstruction and Development on 3 November 2016 at Lviv International Economic Forum. The other financiers of the project include the Danish Climate Investment Fund, the Ukraine Sustainable Energy Lending Facility and the shareholders of LLC KarpatenwInd *(an Eco-Optima group company).* The overall investment amounts to EUR 34 million. The upcoming wind farm Stariy Sambir-2 will comprise six wind turbines Vestas V-112 with a total capacity of 20,7 megawatts. The wind farm is expected to produce approx. 54.3 GWh of electricity per year and reduce carbon dioxide emissions by up to 40 400 tonnes annually.

On 29 December 2016 Ukrgasbank published on its website information on funding a project for construction of 70 MW Novotroitskiy wind power plant, which is implemented by company Vindkraft Tavria in Kherson oblast. Construction of the wind power plant is scheduled by the end of 2017.

In general, the Vindkraft group of companies *(consisting of Vinkraft Ukraina LLC and Vindkraft Tavria LLC)* is implementing two wind projects in Kherson oblast totaling 140 MW. The overall investment amounts to EUR 220 million. The wind farms are expected to produce approx. 470 GWh of electricity per year

9 SMALL WIND TURBINE MARKET

Small wind energy market in Ukraine has been focused on autonomous wind installations *(hereafter "small wind turbine")* to produce electricity for private households. In other words, development of small wind energy market has been based on local investments. Sharp reduction of the population purchasing power caused by the political and economical crises has a negative impact on the small wind energy sector development. As a result, a number of manufacturers of small wind turbines ceased their activities in Ukraine.

27 small wind turbines totaling 75,6 kW were added last year in Ukraine that is almost twice less than in 2015. The installed capacity of small wind sector reached around 15,5 MW.

Wind turbines with a unit capacity ranging from 1 kW to 25 kW are manufactured in Ukraine. Given the situation on the national market of small wind turbines, in 2016 Ukrainian manufacturers focused mainly on exports to the markets, which enjoyed higher demand and government support. Thus, in

Table 8. *Leading companies in the Ukrainian small wind turbine market in 2016*

COMPANY NAME	MANUFAC-TURED, number of turbines	INSTALLED IN UKRAINE, number of turbines	EXPORTED, number of turbines	CUMULATIVE INSTALLED CAPAPCITY, kW
Verano *(Odesa)*	92	10	68	50
WINDER *(Kyiv)*	3	3		5
FLAMINGO AERO *(Kyiv)*	20	14	1	20,6
TOTAL	**0**	**27**	**69**	**75,6**

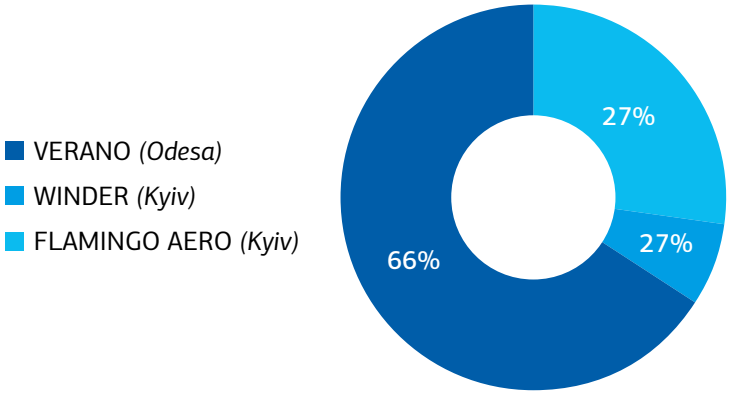
2016 69 small wind turbines with cumulative installed capacity of 209 kW were exported to Kazakhstan, Russia, Tadzhikistan, Germany, Armenia and Kirgizstan. The sector employs over 80 persons.

The market recovery occurred to some extent upon adoption of the Law "On Introduction of Amendments to Some Laws of Ukraine Regarding Ensuring Competitive Conditions of Electricity Production from Alternative Energy Sources". The above-mentioned law has brought significant changes to the regulation of electricity production from wind energy by private households. As a result, private households obtained the right to install generating units intended for the production of electricity from wind, with rated capacity not exceeding 30 kW, and sell the excess of produced electricity by aggregation applying "green" tariffs without a specific license.

However, it is necessary to state that the adoption of the law has a small positive effect on the market.

There is still a number of legal barriers to the successful development of small wind energy sector in Ukraine. Existing difference in "green" tariff rate for electricity generated by residential photovoltaic systems and electricity generated by small wind turbines is one of the biggest obstacles since for hybrid installations of private households *(the most popular)* two points of metering of electricity generation should be registered with respective Oblenergo *(a regional electricity lines operator)*, and fulfillment of this requirement is practically impossible. It should be emphasised that hybrid installations provide the most rational and promising way for the private households to generate and consume power from the Renewable Energy Sources.

Figure 7. *Market shares of three leading companies in 2016*



As a result to date “green” tariff has been applied only for two small wind installations in Ukraine.

UWEA proposes to introduce a single “green” tariff for all types of private households generating facilities operating on renewable energy sources. The proposed mechanism will simplify and reduce the cost of accounting process and the sale of electricity to the grid. Introduction of a single “green” tariff for electricity generated from solar and wind by private households will give a necessary impetus to the development of small wind energy sector in Ukraine that has stagnated for several years already.

10 UKRAINIAN WIND MARKET FORECAST

According to the market survey conducted by the UWEA experts new wind capacity of more than 100 MW is expected to be installed in the country in 2017 *(depending on the WTG delivery schedule),* which would bring a total installed capacity in mainland Ukraine up to 550 MW by the end of 2017.

The Ukrainian company **Eco Optima** which is already operating a wind farm Staryi Sambir-1 with a rated capacity of 13,2 MW in Lviv oblast, plans to install six more wind turbines with a total capacity of 20,7 at a wind farm **Stariy Sambir-2.** The upcoming wind farm is expected to produce approx. 54,3 GWh of electricity per year and reduce carbon dioxide emissions by up to 40 400 tonnes annually. Construction of two more wind farms in Lviv region – Skolivska with an installed capacity of 46,2 MW and Sokalska – 43,2 MW, is also in company’s plans for the coming years.

DTEK RES, which includes wind companies Wind Power LLC and Prymorska LLC is focused on a wind project portfolio of 1,35 GW comprising two wind parks DTEK Pryazovskyi and DTEK Magnush as well as operating 200 MW Botievska wind power plant located in Zaporizhzhya oblast. Beginning of construction of another **200 MW Prymorskaya wind power plant,** a part of DTEC Pryazovskyi wind park, is scheduled for 2017, while its commercial operation is expected in 2018.

Vindkraft Group is planning to construct two wind farms in Kherson oblast – **Novotroitska and Overyanivska totaling 140 MW** by the end of 2018. Upon its implementation the project will be one of the top 3 largest wind power plants in Ukraine. Project documentation has been already finalized and Vindkraft Tavria LLC has been constructing 70 MW Novotroitska WPP while Vindkraft Ukraina LLC, that has been already operating 31 MW of wind power assets in operation in Kherson oblast is planning construction of 70 MW Overyanivska WPP. In addition, Vindkraft Kalanchak LLC has started development of Kalanchatska WPP with installed capacity of 300 MW in Kherson Oblast.

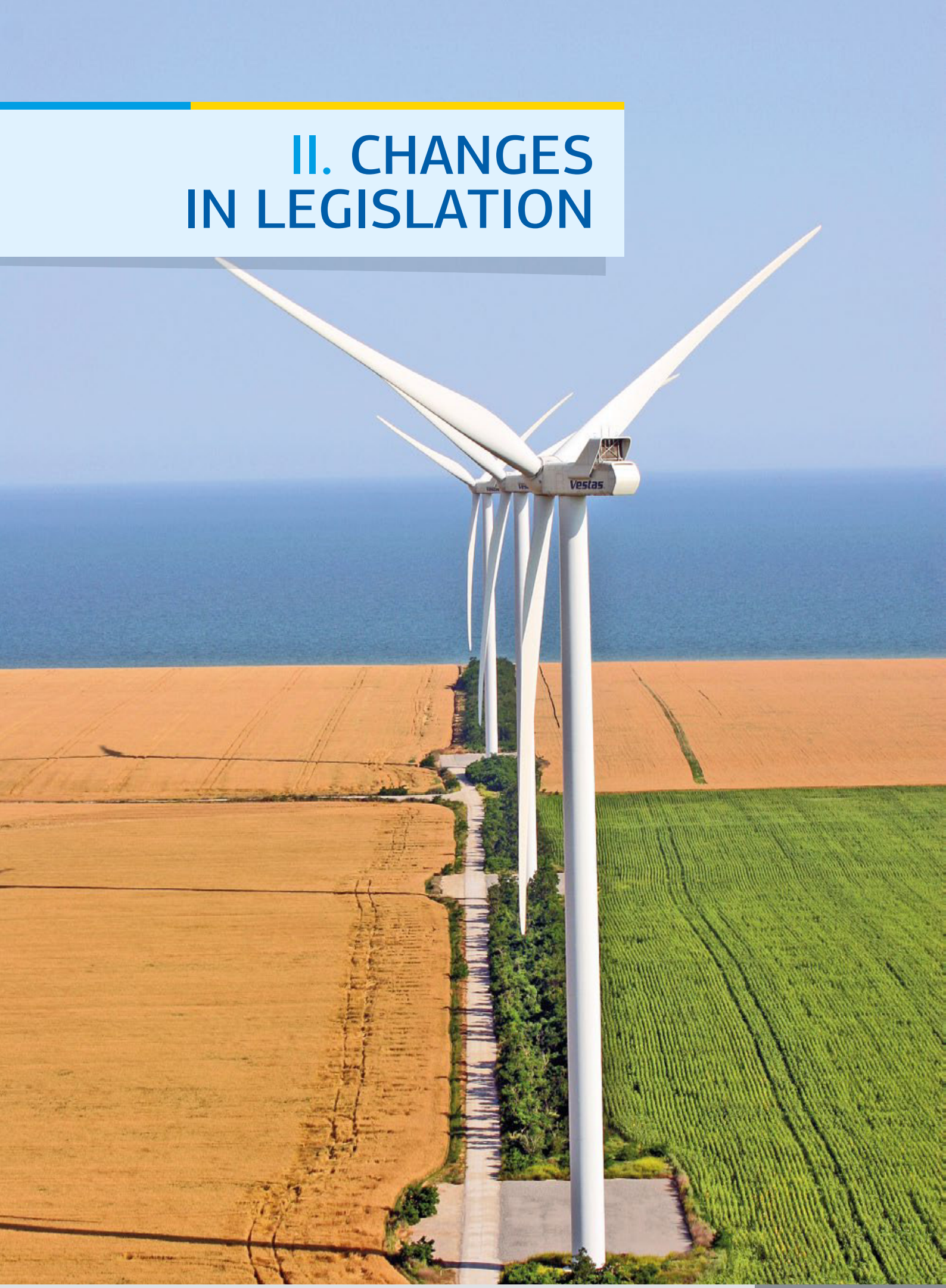
Construction of Ochakivska wind power plant owned by **Management Company Wind Parks of Ukraine** continues in Mykolaiv oblast. Currently the company has 215,5 MW of wind capacity in operation, including 25 MW located on the Crimean Peninsula. Installation of 3+ MW wind turbines of Ukrainian origin at **Prychornomorskiy and Limanskiy wind parks** is scheduled for 2017.

SYVASHENERGOPROM LLC that has been already operating 2.92 MW wind power plant in Kherson oblast, possesses a land plot sufficient for construction of additional 250 MW of wind capacity. Preparation of project documentation is scheduled for 2017 while start of construction is planned for 2018. At the same time, efforts have continued on optimal fundraising for the project.

The 500 MW Tiligulska wind power project implemented by **Wind Energy Project LLC** is also located in Mykolaiv oblast. The plant is at the final phase of project development, negotiations with manufacturers of wind turbine and potential investors have already begun. Substation construction project is currently under development.

Turkish based company **Guris** is implementing wind project **Ovid Wind** in Odesa oblast. The company has already received a building permit. 30 MW first phase of its wind farm project in scheduled for the second quarter 2017 – first quarter 2018. The second phase of the project amounts to 51 MW.

II. CHANGES IN LEGISLATION



1 LEGISLATIVE DEVELOPMENTS IN 2016

LAW OF UKRAINE "ON THE NATIONAL ENERGY AND UTILITIES REGULATORY COMMISSION OF UKRAINE"

Back in 2014, pursuant to the Decree of the President of Ukraine No 694/2014 dated 27 August 2014, the National Energy and Utilities Regulatory Commission of Ukraine *(the "Regulator" or "NEURC")* was established, and later on a respective Regulation was approved, according to which NEURC is a state regulatory authority in the energy and utilities sector.

Later on, in 2016, to synchronise Ukrainian law with laws and regulations of the European Union, the Verkhovna Rada of Ukraine passed the Law of Ukraine "On the National Energy and Utilities Regulatory Commission of Ukraine" dated 22 September 2016 *(the "Law"),* aimed at, inter alia, establishing the preliminary conditions for stable state regulatory effect on operations of natural monopoly entities in the energy sector in the form of the Regulator's decisions. The Law serves to provide for the transparency of the Regulator's decision making and to add up predictability to operations of the energy sector entities.

The Law took effect from the date following its publication *(it was officially published in the Holos Ukrainy on 25 November 2016),* save for Article 11(1), Article 13 of the Law, which have taken effect on 1 January 2017.

The Law defines Regulator as a continuing independent collegial state authority that regulates, monitors and controls operations of entities active in the energy and utilities sector.

Pursuant to the Law, the Regulator shall, inter alia, exercise state control, monitor and supervise activities of active that generate, transfer, distribute and supply electric energy, in particular in the form of:

1) laws and regulations, where the law grants the respective rights to the Regulator;
2) licensing of operations in the energy and utilities sector;
3) shaping of the pricing and tariff policy in the energy and utilities sector, and implementation of the appropriate policy, where the law grants the respective rights to the Regulator;
4) state control and enforcement actions;
5) other measures provided for by law.

The Regulator's decisions are not subject to approval by the government authorities, save for the instances provided for by competition law, and may be appealed to the court, in which case their performance will not be suspended.

The Regulator consists of seven members, including a chairperson; two members will be appointed by the President of Ukraine, two – by the Verkhovna Rada of Ukraine, and one – by the Cabinet of Ministers of Ukraine.

Procedure for approval of decisions by the Regulator

The Regulator will approve decisions at its meetings to be held as open hearings *(save for the meetings convened to consider issues involving confidential information).*

A meeting of the Regulator will be competent if the majority of its members *(4 persons)* are present. The Law permits representatives of entities of the energy and utilities sector, government and local authorities, public organization, mass media and other stakeholders take part in open hearings.

The list of issues to be considered by the Regulator will be placed on the Regulator's publicly available website no later than three business days prior to the date of the meeting.

In addition to the said list, the Regulator will place on its website the draft decisions, including the any reasoning, comments and proposals as may be submitted, and substantiated opinion of the Regulator on such comments.

A Regulator's decision will be deemed approved if at least four members of the Regulator who are present at the meeting vote for it, and is not subject to registration with the Ministry of Justice.

Control in the sphere of energy

The Law establishes that the Regulator exercises state control over the compliance by the economic entities operating in the energy and utilities sector with law regulating the respective spheres and the licensing terms by running routine and extraordinary remote audits and field audits in accordance with the control procedures approved by the Regulator.

An audit will be carried out pursuant to the Regulator's decision by an appropriate commission. Results of audit will be documented by a certificate.

Liability in the sphere of energy

In case of a violation of legislation on energy and utility services, the Regulator may penalize the defaulting entities by either issuing a warning and/or a notice requiring to remove violations, or imposing a fine, or terminating or revoking the license.

Under the Law of Ukraine "On Electric Power Industry" the Regulator has similar authorities. However, within the context of termination of licenses such measures are inconsistent with the Law of Ukraine "On Licensing of Certain Types of Economic Activities", which is treated as a framework law in the sphere of licensing. The said inconsistency suggests appealing against the respective decisions in accordance with the procedure established by law.

Economic entities penalized with a fine are obligated to pay it within 30 days from the date of receipt of a copy of decision awarding the fine *(other than a fine for non-payment or incomplete payment of the fee for financing of the Regulator).* In case of late payment of fine, interest will be charged at the rate of 1.5 per cent of the fine; however, in any case interest will not exceed the amount due as fine. The defaulting entity will be obligated to notify the Regulator about payment of fine and provide the related documents.

Where the defaulting entity refuses to pay a fine or a default interest, the Regulator may recover it through a competent court.

PROCEDURE FOR DETERMINING THE UTILIZATION RATE OF EQUIPMENT OF UKRAINIAN ORIGIN AT ELECTRICITY FACILITIES, INCLUDING THE OPERATIONAL PHASES OF POWER PLANT PROJECTS (START-UP FACILITIES) THAT GENERATE ENERGY FROM ALTERNATIVE ENERGY SOURCES (OTHER THAN FACILITIES THAT USE BLAST FURNACE GAS AND COKING PLANT GAS, AND SOLELY MICRO-, MINI- AND SMALL HYDROPOWER PLANTS IN CASE OF USE OF HYDROENERGY), AND ESTABLISHING A PREMIUM ON THE 'GREEN' TARIFF

Pursuant to the Law of Ukraine "On Electric Power Industry", on condition of compliance with the utilization rate of equipment of Ukrainian origin a premium on the 'green' rate will be established for electricity facilities commissioned during the period from 1 July 2015 to 31 December 2024, including the operational phases of power plant project *(start-up facilities),* which generate energy from alternative energy sources, in the amount set out by Article 17-3 of the Law.

On 26 February 2016, by its Resolution No 2932 dated 10 December 2015 NEURC approved the Procedure for determining the utilization rate of equipment of Ukrainian origin at electricity facilities, including the operational phases of power plant projects *(start-up facilities)* that generate energy from alternative energy sources *(other than facilities that use blast furnace gas and coking plant gas, and solely micro-, mini- and small hydropower plants in case of use of hydroenergy)*, and establishing a premium on the 'green' tariff *(the "Procedure").*

The Procedure covers economic entities licensed to generate electric energy, which own or use electricity facilities and intend to distribute electric energy at the 'green' tariff in accordance with the procedure established by law.

The fact and date of commissioning of an electricity facility will be evidenced by either *(i)* a certificate issued by the competent authority *(State Architectural and Construction Inspectorate),* which certifies the conformity of the completed facility to the design documents and its availability for operation, or *(ii)* a facility operational readiness declaration duly registered in accordance with law.

The utilization rate of equipment of Ukrainian origin at the electricity facility will be calculated as the total of the respective relative rates of components. In particular, for wind generators such components are:

Component	Relative rate, %
Blades	30
Tower	30
Gondola	20
Main frame	20
TOTAL FOR THE FACILITY	**100**

The adequacy of the utilization rate of equipment of Ukrainian origin is assessed based on the calculations and support documents submitted by the applicant.

For wind generators a premium to the 'green' tariff will be 5% where the utilization rate is equal to or exceeds 30 percent %, and 10% where the utilization rate is equal to or exceeds 50 per cent.

The Ukrainian origin of components *(the fact of production of components in the territory of Ukraine)* is evidenced by a Ukrainian origin certificate issued in accordance with the established procedure by the Chamber of Commerce and Trade of Ukraine *(its local representative office).*

To get a premium on the 'green' tariff, the applicant files to NEURC an appropriate request and the following documents *(either as originals or as duly certified copies):*

- an explanatory note regarding the equipment of Ukrainian origin available at the electricity facility, with a reference to the documents certifying *(i)* the Ukrainian origin and *(ii)* the ownership *(right of use)* of components *(elements of equipment);*
- calculations of the utilization rate of equipment of Ukrainian origin at the electricity facilities;
- documents certifying the Ukrainian origin of equipment;
- certificates of ownership *(right of use)* of such components *(elements of equipment);*
- details *(name, YeDRPOU code)* of contractors *(general contractor)* that performed drilling work on the power generating facilities that produce electric energy by employing geothermal energy.

NEURC will consider such request and support documents within 30 calendar days from the date of filing at its meeting held in the form of open hearing and, based on results of consideration, will pass a decision on establishing a premium on the 'green' tariff *(which will be executed as a resolution).*

Where the applicant submits an incomplete set of document, or the submitted documents are not sufficient to establish the adequacy of the utilisation rate of equipment of Ukrainian origin *(or to confirm the Ukrainian origin or the ownership (the right of use) of components),* NEURC will notify the applicant to that effect within 15 calendar days from the date of filing.

In such event, the applicant will be obligated to file the additional documents requested by NEURC within 15 calendar days from the date of receipt of a respective written notice, and the term for consideration of request will be extended by 10 calendar days. If the applicant fails to file the requested documents, the requested will be reverted to the applicant.

AMENDMENTS TO RESOLUTION OF THE CABINET OF MINISTERS OF UKRAINE NO 263 DATED 7 MAY 2015 "ON SPECIFIC ASPECTS OF REGULATING RELATIONS IN THE SPHERE OF ELECTRIC ENGINEERING IN THE TERRITORIES WHERE THE GOVERNMENT AUTHORITIES TEMPORARILY DO NOT EXERCISE THEIR RIGHTS OR EXERCISE THEM ONLY IN PART"

By its Resolutions No 368 dated 25 May 2016, No 416 dated 6 July 2016 and No 985 dated 21 December 2016, respectively, the Cabinet of Ministers of Ukraine amended Resolution of the Cabinet of Ministers of Ukraine No 263 dated 7 May 2015 "On specific aspects of regulating relations in the sphere of electric engineering in the territories where the government authorities temporarily do not exercise their rights or exercise them only in part" *(the "CMU Resolution No 263").*

CMU Resolution No 263, as amended, permits to purchase and sale electricity generated by LLC "Wind Park "Novoazovskyi", which is a member of "Wind Parks of Ukraine" Group and operates in the uncontrolled territory, on condition of technical feasibility of supplying *(transferring)* the generated energy to controlled territories.

The limitation requiring the local electric networks to sell electric energy to the uncontrolled territory or industrial consumers of a respective sector does not apply to LLC "Wind Park "Novoazovskyi".

Settlements with LLC "Wind Park "Novoazovskyi" for electricity are carried at the 'green' tariff in monetary form and in full.

Also, the said amendments approved the proposal of the Ministry of Energy and Coal Industry of Ukraine regarding payments, no later than on 31 December 2016, by LLC "Wind Park "Novoazovskyi", LLC "Wind Park "Krasnodarskyi", "Wind Park "Lutuhynskyi", VEO "Vitroenergoprom" and further allocation of such funds to repayment of tax liabilities, and recommended NEURC to issue a decision to that effect.

NEURC DECISION ON EXECUTION OF ELECTRICITY PURCHASE AND SALE AGREEMENTS BETWEE N ST «ENERGORYNOK» AND ENTITIES GENERATING ENERGY FROM ALTERNATIVE ENERGY SOURCES, DATED 31 MARCH 2016 AND 2 JUNE 2016

By its protocol resolution No 8 dated 31 March 2016, NEURC recommended SE "Energorynok" to amend the executed electricity sale and purchase agreements between SE "Energorynok" and entities generating energy from alternative energy sources, and further, when executing such agreements, specify that they are effective until 1 January 2030.

On 2 January 2016, NEURC held its meeting in the form of open hearing, which issued, inter alia, a decision obligating SE "Energorynok" to amend the executed energy sale and purchase agreements between SE 'Energorynok» and entities generating energy from alternative energy sources, and further, when executing such agreements, specify that they are effective until 1 January 2030, and unconditionally comply with the Terms and Conditions of Entrepreneurial Activity on Wholesale Distribution of Energy.

Though no such protocol, resolution or order may be found in the public sources, NEURC posted information on approval of such decision on its official website.

It should be noted that a model energy sale and purchase agreement between SE "Energorynok" and entities generating energy from alternative energy sources was approved by NEURC Resolution No 1314 dated 11 October 2012.

Pursuant to provisions prescribing to execute NEURC decisions as resolutions or orders, for proper implementation such decision should be properly documented.

REGULATION ON THE PROCEDURE FOR BORROWING BY RESIDENTS OF FOREIGN CURRENCY FACILITIES OR LOANS FROM NON-RESIDENTS, AND EXTENDING OF FOREIGN CURRENCY LOANS BY RESIDENTS TO NON-RESIDENTS, AS APPROVED BY NBU RESOLUTION NO 270 DATED 17 JUNE 2004

The procedure for borrowing by residents of foreign currency facilities and loans from non-residents, and extending of foreign currency loans by residents to non-residents is regulated, inter alia, by NBU Resolution No 270 dated 17 June 2004 *(the "NBU Resolution No 270").*

Until recently, pursuant to NBU Resolution No 270, it was prescribed that the total of loan interest payable at the rate set out by the loan agreement, including commission, penalty interests and other charges set out by the agreement, including the default interest should not exceed the amount of repayment to be calculated at the maximum interest rate established by the NBU. In particular, such interest rate was established according to NBU Resolution No 363 dated 3 August 2004.

On 22 November 2016, NBU Resolution No 270 was amended to include provisions establishing that where a loan to a resident borrower is granted by a non-resident lender via an official export credit agency *(the "ECA")* listed on the website of the Organisation for Economic Co-operation and Development, then, to prevent repayments in excess of the maximum interest rate established by the loan agreement, calculations of the loan interest must not include the amounts payable under the agreement by a resident borrower *(including an authorised borrowing bank)* to the benefit of a non-resident lender to reimburse the lender's actual costs of financing by ECA *(fee, premium, commission, and other, as may be payable to ECA),* which are directly related to the loan.

According to the opinion of the National Bank of Ukraine, such amendment will offer much better opportunities for Ukrainian businesses willing to take foreign loans via ECA.

The list of ECA may be found at:
http://www.oecd.org/trade/xcred/eca.htm.

METHODS FOR CALCULATING THE FEE FOR CONNECTION OF A POWER GENERATING FACILITY TO THE ELECTRIC NETWORK

On 22 November 2016, amendments to the "Methods for calculating the fee for connection of a power generating facility to the electric network", as approved by NEURC Resolution No 115 dated 12 February 2013, took effect.

The said amendments detail technical specification requirements for applicants' power generation facilities with a declared capacity of 160 kW – 5000 kW, provide for a linear component of the fee chargeable for a non-standard connection, a formulae for calculation of such fee, and are designed to grant equal opportunities to all applicants willing to connect their generating facilities to the electric network.

DECREE OF THE PRESIDENT OF UKRAINE NO 200/2016 DATED 10 MAY 2016 "ISSUES OF UKRAINE'S ACCESSION TO THE CHARTER OF THE INTERNATIONAL RENEWABLE ENERGY ASSOCIATION (IRENA)"

Decree of the President of Ukraine No 200/2016 dated 10 May 2016 "Issues of Ukraine's Accession to the Charter of the International Renewable Energy Association *(IRENA)*" recognised it reasonable for Ukraine to accede to the Charter of the International Renewable Energy Association *(IRENA)*, and instructed to file for Ukraine's accession to the said organisation.

As reported by the government, the State Agency for Energy Efficiency and Energy Saving of Ukraine filed a respective request, and none of IRENA member states expressed any objections, which means that the requested approval was granted.

Apparently, the next step will be the approval of the Law of Ukraine "On Ukraine's Accession to the Charter of the International Renewable Energy Association *(IRENA)*", the draft of which is currently negotiated with the central executive authorities.

Ukraine' accession to IRENA Charter is expected to expand cooperation with developed countries in the sphere of renewable energy, bring in best practices and advanced methods of project financing to this sector. Also, it may facilitate further filing to the Abu Dhabi Fund for Development *(ADFD)* for get cheap loans for implementation of 'green' projects. Currently, the budget of ADFD is USD 350 million, and loans are granted on a competitive basis at the interest rate of 1%-2% for the term of up to 20 years.

2 EXPECTED LEGAL DEVELOPMENTS IN 2017

In addition to effective legal changes in 2016, legal developments in 2017 are equally promising.

LAW OF UKRAINE "ON AMENDMENTS TO CERTAIN LEGAL ACTS OF UKRAINE RELATED TO IMPROVEMENT OF URBAN PLANNING" (DRAFT LAW NO 4733-1)

On 17 January 2017, the Verkhovna Rada approved the Law of Ukraine "On Amendments to Certain Legal Acts of Ukraine" *(draft law No 4733 1),* which is being prepared for signing by the President of Ukraine.

Currently, the Law of Ukraine "On Regulation of Urban Planning" breaks down all construction projects according to their complexity into categories I, II, III, IV and V, which are determined in accordance with state construction norms and standards based on the consequence *(criticality)* class of the respective project.

For synchronisation with best European practices, the above-mentioned amendments cancel the requirement to determine the complexity categories; as a result, drafting of design documents, procedures for approval and commissioning of completed projects will depend on the consequence *(criticality)* class of the respective project.

A particular consequence *(criticality)* class of a building or a structure characterises a level of potential threat to the life and safety of individuals permanently or temporarily staying in or outside such building or structure, material and social losses resulting from termination of its operation, or loss

of its integrity. All projects are classified according to the consequence *(criticality)* class as follows:

- CC1 *(earlier known as I or II consequence class)* – for low consequence;
- CC2 *(earlier known as III or IV consequence class)* – for medium consequence);
- CC3 *(earlier known as V consequence class)* – for high consequence.

The above-mentioned amendments provide for a shift from a three-stage system of approvals *(notice, declaration, approval)* to a two-stage system *(notice, approval)*. In addition, for projects classified as CC2 or CC3 *(medium or high consequence)* the applicant may get the right to proceed with construction work upon obtaining the permit for construction work, while for CC1 project *(low consequence)* construction works may commence upon the applicant's notice of proceeding with them.

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

Consequently, once the Law takes effect, the said amendments will be binding for the purposes of drafting and negotiating the design documents, and commissioning of energy projects.

DRAFT LAW "ON ELECTRICITY MARKET IN UKRAINE" NO 4493.

On 22 September 2016, the Verkhovna Rada of Ukraine approved in the first reading the draft Law of Ukraine "On Electricity Market in Ukraine".

The said draft is expected to replace the Laws of Ukraine "On Electric Power Industry" and "On the Principles of Operation of the Electricity Market in Ukraine", and provides for a step-by-step transfer to a new model of the electricity market.

The draft provides for the electricity market system that will include a market of bilateral agreements, a ''day-ahead', diurnal, balancing, auxiliary services, and retails markets.

A mandatory requirement for operations in the market is the execution by a potential electricity market player *(other than consumer purchasing electricity under an electricity supply contract)* of an imbalance settlement agreement with a transmission system operator.

It is expected that producers will have the right to sell electricity produced by the electricity facilities generating electricity from renewable energy sources under bilateral agreements, in the 'day-ahead', diurnal or balancing market at the prices created on the respective market or the 'green' tariff, subject to the premium granted to the guaranteed purchaser.

To sell electricity at the 'green' market, producers are obligated:

1) to become market players;

2) to execute bilateral agreements with guaranteed purchasers, substantially in the form of a standard 'green' tariff electricity sale and purchase agreement, and, according to such agreements, to become members of the balancing group of electricity producers at the 'green' tariff. Electricity producers at the 'green' tariff are expected to make such agreements after documenting their land rights and obtaining the construction permits, since agreements of such type are executed solely upon commissioning of the power plant;

3) on a daily basis, to sell electricity to a guaranteed purchaser in the daily volumes prescribed for the next day in accordance with such procedure and in such form as specified in the bilateral agreement with a guaranteed purchaser.

Where the actual volumes of electricity supplied by electricity producers that apply the 'green' tariff differ from the prescribed daily volume, the producers that are members of the balancing group of producers at the 'green' tariff will reimburse the guaranteed purchaser for a percentage of the imbalance settlement value in accordance with the rules of operation of the balancing group of producers at the 'green' tariff.

Prior to the second reading of the draft law, UWEA proposed to amend the language of the draft law by including provisions on reimbursement of a percentage of imbalance settlements, specifically section 11 of Final and Transfer Provisions that will read as follows:

"11. A percentage of the amount reimbursable to the guaranteed purchaser by producers of electricity on the electricity facilities generating wind or solar energy, which apply the 'green' tariff and which are members of the balancing group of producers at the 'green' tariff, for the value of the guarantee purchaser's imbalance settlement, shall be:

on or before 31 December 2020 – 0%
from 1 January 2021 – 10%
from 1 January 2022 – 20%
from 1 January 2023 – 30%
from 1 January 2024 – 40%
from 1 January 2025 – 50%
from 1 January 2026 – 60%
from 1 January 2027 – 70%
from 1 January 2028 – 80%
from 1 January 2029 – 90%
from 1 January 2030 – 100 %

A percentage reimbursable to the guaranteed purchaser for the imbalance settlement value shall, with effect from 1 January 2021, apply solely to the producers of electricity from renewable energy sources (and in case of hydroenergy – produced solely by micro-, mini- and small hydropower plants), including the producers at the 'green' tariff, with facilities commissioned on or after 1 January 2021, and such percentage shall remain the same as established for the year of commissioning of the respective electricity facility that generates energy from renewable energy sources (and in case of hydroenergy – produced solely by micro-, mini- and small hydropower plants).

For step-by-step commissioning of the electricity facility generating energy from renewable energy sources (and in case of hydroenergy – produced solely by micro-, mini- and small hydropower plants) a percentage of reimbursement to the guaranteed purchaser for the value of the guaranteed purchaser's imbalance settlement for the period until 31 December 2029 inclusive shall be the same as established for the year of commissioning of the respective stage of the power generating facility producing energy from renewable sources (and in case of hydroenergy – produced solely by micro-, mini- and small hydropower plants).

Reimbursement by the producer of electricity that produces energy at the electricity facilities generating energy from wind energy and is a member of the balancing group of producers at the 'green' tariff, or by the party liable for the balance of the balancing group of producers at the 'green' tariff that was created according to parts 6-8 of Article 71 of this Law, for the value of the guaranteed purchaser's imbalance settlement shall be effected where the actual volume of energy generated by such producer exceeds the volume voluntarily established by such producer for the period from 1 January 2021 to 31 December 2029 more than by 35%".

Such amendments will be effective on condition of hourly adjustments of the forecasted volumes of wind or solar energy under secondary legislation on the diurnal market.

In addition, we may expect system changes of the procedure for connection to the electric network, as suggested by the draft law, in particular regulation of the procedure for connection to the network, payment for reconstruction of the linear component of connection, and selection of the provider of such services, ect. In addition to such changes NEURC initiates certain changes of the procedure for connection to the network, in particular the terms for non-standard connection, requirements to technical specifications, and other.

DRAFT LAW "ON AMENDMENTS TO CERTAIN LEGAL ACTS OF UKRAINE RELATED TO SIMPLIFICATION OF THE PROCEDURE FOR ALLOCATION OF LAND FOR CONSTRUCTION OF FACILITIES GENERATING HEAT AND/OR ELECTRIC ENERGY FROM RENEWABLE SOURCES AND/OR BIOLOGICAL FUELS" NO 2529A

This draft law provides for placement of the electric facilities generating heat and or electric energy from renewable sources and/or biological fuels on the land plots of all categories, without changing their designated purpose. In addition, the draft law provides for cancellation, with effect from 1 January 2018, of the mandatory requirement to develop a zoning plan and/or a detailed plan of the territory for the land plot allocated from the state owned or municipal properties for construction of the above-mentioned facilities.

DRAFT LAW "ON AMENDMENTS TO THE LAW OF UKRAINE 'ON REGULATIONS OF URBAN PLANNING'" IN PART OF LIMITATION OF THE EFFECTIVE TERM OF TECHNICAL SPECIFICATIONS"

The said draft has been prepared by the State Agency for Energy Efficiency and Energy Saving of Ukraine to resolve the problem of reservation of capacities for connection of electricity facilities generating energy from alternative energy sources.

In particular, the draft offers to limit the effective term of technical specifications for electricity facilities generating energy from alternative energy source to two years, with an option to extend such term up to five years.

Technical specifications issued prior to the effective date of this Law will be valid during the period specified by the connection and use agreement; however, no more than for five years from the date of approval of such technical specifications.

LAW OF UKRAINE "ON ASSESSMENT OF THE ENVIRONMENTAL IMPACT" (VETOED BY THE PRESIDENT OF UKRAINE)

On 4 October 2016, the Verkhovna Rada of Ukraine approved the Law of Ukraine "On Assessment of the Environmental Impact" *(draft law No 2009a),* which provides for introduction of the environmental impact assessment for the purposes of considering the granting of approval for conduct of economic activity that may have a significant environmental impact, subject to state, public and private interests.

The procedure for environmental impact assessment will include the following:

1) the entity's drafting of the environmental impact report;
2) holding of public discussions;
3) analysis of information by the designated authority;
4) issue by the designated authority of a substantiated decision regarding the environmental impact;
5) taking into account the decision on environmental impact in the decision regarding conduct of the requested activity.

For this purpose, the **requested activity** within the context of law means economic activities that include new construction, re-construction, technical re-equipping, major repair of the construction objects, extension, changing of profile, liquidation *(dismantling)* of facilities, other interventions in nature.

Where the economic activity violates the legislation on environmental impact assessment, it may be limited, suspended or terminated.

It should be noted that according to the above-mentioned law, provisions that require conducting the environmental impact assessment apply, **inter alia,** to wind parks and wind power plants that have two or more turbines, or of the height of 50 meters or more. Such objects are treated as objects of the second category that may have significant environmental impact.

By referring to the excessive regulatory burden created by the law, and imperfect language of some provisions, which altogether may significantly complicate the conduct of economic activity the President of Ukraine vetoed the law and reverted it for improvement.

The Parliament has been considering proposals of the President to the said law.

PROCEDURE FOR COMMERCIAL REGISTRATION OF ELECTRIC ENERGY GENERATED BY ELECTRICITY FACILITIES GENERATING ENERGY FOR ALTERNATIVE ENERGY SOURCES

It is expected that in 2017 NEURC will approve the procedure for registration of electric energy generated by electricity facilities for alternative energy sources. Current provisions of the Law of Ukraine "On Electric Power Industry" prescribing to apply the 'green' tariff solely for payment of a difference between the volume of energy produced by the electric plant and consumed by it are impracticable due to the absence of the procedure for calculation of the respective balance. Upon approval of the procedure for calculation and documenting the balance of net power flow, the respective mechanism will become practicable. The respective draft law was posted on the website of NEURC on 19 December 2016.

UPDATE ENERGY STRATEGY OF UKRAINE UP TO 2035

The current Energy Strategy of Ukraine for the Period up to 2030 was approved by the Resolution of the Cabinet of Ministers of Ukraine in summer 2013. Due to critical changes and new challenges that Ukraine faces in political, economic and energy spheres, in 2014 and in 2015 the National Security and Defense Council of Ukraine issued a number of decisions substantiating the need to update the said Strategy. The Ministry of Energy and Coal Industry in cooperation with the National Institute for Strategic Studies and Ukrainian Centre for Economic and Political Studies named after Olexander Razumkov has developed a draft Energy Strategy for the Period up to 2035.

The draft Strategy was made publicly available on 19 December 2016 via the official website of the Ministry of Energy and Coal Industry, and UWEA has already filed to the Minister of Energy and Coal Industry a proposal on improvement of the said draft. UWEA is of the opinion that the proposed draft significantly changes the international concept in part of termination of use of fossil fuels and conflicts the current legislation of Ukraine supporting the idea of increasing the use renewable energy sources and introducing energy efficiency technologies.

In particular, the draft Strategy specifies that "The main direction for activities in 2015-2035 in part of increasing the use of RES in Ukraine will be to re-consider the state policy stimulating the use of RES... to shift the focus of the state policy from the sphere of production of electricity by high capacity facilities that use mainly the wind or solar energy to the low capacity facilities the use renewable energy sources. This is expected to result in increasing the share of the electric power industry generating energy from solid biomass and biogas *(if available)* on a local level".

This approach is erroneous, since solely generating the electric power at industrial wind and solar power plants may lead to true energy independence and achieve the targets set out by the National Action Plan for RES Development by 2020.

In addition, the draft Energy Strategy provides for reducing the share of wind and solar energy industry to 500 MW by 2025, which is also in conflict with the National Action Plan for RES Development by 2020 that was approved by the Cabinet of Ministers of Ukraine on 1 October 2014 as a part of commitment of Ukraine towards the European Energy Community.

A new energy system in Ukraine should be developed concurrently with development of the national industry, which, in its turn, will enable creation of new jobs. The Law of Ukraine "On Amendments to Certain Legal Acts of Ukraine Related to Providing for Competitive Conditions for Generation of Electricity from Alternative Energy Sources" No 514 – VIII dated 4 June 2015, significantly amended RES legislation. The legislative support of domestic producers of wind and solar generating equipment by introducing a 5% – 10% mark-up *(premium)* to the applicable 'green' tariff for use of equipment of Ukrainian origin is an efficient incentive for modern machine building industry on the basis of licensed technologies offered by world producers of equipment for wind and solar generation facilities.

Today it is true to say that the State Agency for Energy Efficiency and Energy Saving of Ukraine took into account the position of Energy Association which is consistent with comment of the European Commission.

III. UWEA ACTIVITY

1 PARTICIPATION IN LEGISLATIVE PROCESS

2016 was one of the key years in the history of the UWEA in terms of the national law-making process, namely the development and adoption of legal documents that will have a direct impact on the further development of the wind power industry, and the entire renewable energy sector of Ukraine.

It is, first of all, the association's involvement in the development and discussion of such two fundamental bills for the national electricity market as "On the Electricity Market of Ukraine" and "On the National Commission for State Regulation of Energy and Utilities". The first draft law passed the first reading in the Parliament in September; the second one was adopted in late October 2016.

Members of the UWEA Expert Council actively participated in the meetings devoted to these issues and organised by the Verkhovna Rada Committee on Fuel and Energy Complex, Nuclear Policy and Nuclear Safety *(VRU Fuel and Energy Committee)*, National Commission for State Regulation of Energy and Utilities, State Agency for Energy Efficiency and Energy Saving, Ministry of Energy and Coal Industry of Ukraine, SE NEC Ukrenergo and ST Energorynok. The UWEA members always defend EC-based principles and approaches to the energy sector development and wind power industry in particular.

It should be noted that like in previous years the World Wind Energy Association as well as WindEurope provided their consulting support to the Ukrainian Wind Energy Association. The UWEA is a member of the WWEA and WindEurope.

CONSULTATION MEETING BETWEEN SE "ENERGORYNOK" AND UWEA

The first consultation meeting between the UWEA Expert Council members and representatives of the SE "Energorynok" on the positions of the draft law "On Electricity Market of Ukraine" was conducted on **15 July.** The participants focused mainly on the issues related to the imbalance settlement for "green" electricity producers-members of Balance Responsible Group and relations between the Guaranteed Buyer and wind and solar generators. The UWEA members expressed deep concern on the establishment of an appropriate national system for forecasting in the RE electricity output.

"Introduction of the balancing responsibilities by wind power generators need to take into account the market maturity as well as the penetration level of wind power in the power system and availability of sophisticated forecast methods", stressed Andriy Konehcenkov, UWEA Chairman. "Professional discussion regarding all existing factors that contribute to solving these issues will enable us to find an adequate solution and ensure further development of the RE projects in the country."

PARLIAMENTARY CONTROL OVER IMPLEMENTATION OF NATIONAL RENEWABLE ENERGY ACTION PLAN

A round table devoted to the implementation of the National Renewable Energy Action Plan of Ukraine *(National Action Plan)* was held by the Parliamentary Committee on Fuel and Energy Complex, Nuclear Policy and Nuclear Safety on **16 May.**

It was attended by Sergiy Savchuk, Head of State Agency on Energy Efficiency and Energy Saving of Ukraine, parliamentarians and energy experts. Key issues raised during the subsequent discussion included opportunities, barriers and next steps to facilitating widespread "green" energy development in the country.

Oleksander Dombrovsky, MP of Ukraine, First Deputy Head of the Verkhovna Rada Committee on Fuel and Energy Complex, Nuclear Policy and Nuclear Safety, emphasized the need to accelerate the development of renewable energies in Ukraine and presented impressive statistics on the RE development in the leading world countries.

Sergiy Savchuk, Head of State Agency for Energy Efficiency and Energy Saving of Ukraine in his key report recalled that the National Renewable Energy Action Plan of Ukraine aimed at achieving at least 11 percent share of energy from renewables by 2020. Mr. Savchuk also informed that implementation of the National Action Plan would require about EUR 16 bln of investment. "For Ukraine to attract investment in the renewable energy industry means economic development including small and medium business sectors, new jobs, innovative environmentally friendly technologies and energy decentralization", he stressed.

VERKHOVNA RADA ROUND TABLE ON NEW MODEL OF ELECTRICITY MARKET

A round table devoted to key challenges for the new electricity market was held on **23 September** 2016 in the Verkhovna Rada of Ukraine. The event was organised by the Verkhovna Rada Committee on Fuel and Energy Complex, Nuclear Policy and Nuclear Safety with the support of the UK Government.

The day before, on 22 September the Verkhovna Rada adopted in first reading the draft law on the electric energy market, coordinated with the Energy Community Secretariat, which provides for introduction of a new market model. Draft law No. 4493 received votes of 237 Members of Parliament.

A set of issues was discussed at the meeting with a main focus on the identification of possible prospects and risks of Ukrainian's transition to the new market model. In his presentation Andriy Konechenkov, Chairman of the UWEA's Board, highlighted conditions for successful RE development in Ukraine under the new model of electricity market: "There are many factors that directly affect, both positively and negatively, the further development of renewable electricity generation, primarily wind and solar. Removing legal barriers to a widespread use of advanced renewable energy technologies as was done in the EU countries, contributes not only to the national power system restoration but also to the implementation of the National Renewable Action Plan until 2020, and commitments undertaken by Ukraine in the context of association with the EU and the Paris agreement on climate change".

RES AND ENERGY EFFICIENCY IN A NEW ENERGY STRATEGY OF UKRAINE

In continuation to a series of discussions on decarbonisation and decoupling of Ukrainian economy, conducted by the Verkhovna Rada Committee on Fuel and Energy Complex, Nuclear Policy and Nuclear Safety, a Roundtable "RES and Energy Efficiency in a New Energy Strategy of Ukraine – an Imitation of the Changes or the Basis for the Reform of the Energy Sector?" was held on **12 October** 2016.

Mr. Hans-Josef Fell, President of Watch Energy Group, former member of the Bundestag, Ukrainian MPs, representatives of the Ministry of Energy and Coal Industry of Ukraine, the State Agency for Energy Efficiency and Energy Saving of Ukraine, National Academy of Sciences of Ukraine, UWEA, international and Ukrainian energy experts attended the meeting.

Much of the discussion on the Energy Strategy of Ukraine up to 2035 focused on the place and role of renewables and energy efficiency in the renewed Energy Strategy of Ukraine, possibility of a transition to 100% RES by 2050, and the transition to 100% RES as a tool for accelerating economic development and national security.

The Roundtable participants signed a **Memorandum 25%-25%-35% by 2035 aiming at achieving 25% reduction of energy consumption, 25% increase of the RES share in the final energy consumption and 35% reduction of greenhouse gas emissions by 2035** *(base year 1990).*

Today we discuss the way the energy sector of Ukraine to be developed in the near future. Ukraine has a potential to draw 100 % of its electricity generation from renewables. The implementation of such ambitious plans requires, above all, a strong political will, a balanced energy mix based on large-scale introduction of energy saving and energy efficiency technologies; and we have to eliminate the existing barriers in the renewable energy sector that not only inhibit the development of renewables, but also negatively affect the investment climate in the country.

2 STATISTICAL OVERVIEWS, PUBLICATIONS, INTERVIEWS

As in the past, the UWEA experts conducted half-year and annual market researches and produced statistical overviews of the wind market of Ukraine. Information generated from the researches was provided to the national and international professional institutions and organizations.

In addition UWEA continued its practice of participating and contributing to the global and regional RE market reviews developed by such international institutions as REN21, IRENA, Make Consulting, WindEurope, GWEC, WWEA.

In the fourth quarter the UWEA jointly with All-Ukrainian Energy Assembly started work on the book "Legal and Technical Regulations for Electricity Industry: Renewable Energy. Wind Power Plants". The authors systematized the existing regulatory framework for wind power in Ukraine to provide the most complete information on relevant policies and legal requirements. Chapter devoted to implementation phases of projects for construction of wind power generating facilities is of particular importance. It presents a detailed scheme for planning and construction of wind farms in Ukraine. Publication of the book is scheduled for the first quarter of 2017.

Several articles and interviews by the UWEA expert devoted to current wind energy issues were published in national and regional journals including Dzerkalo Tyzhnya, Seti & Business, Terminal, Business and some professional Internet resources – Elektrovisti, UA-energy, Oil and Gas, Energy News.

The members of the Board and Expert Council participated in the press-conferences held by different news agencies including Interfax, Ukrainian News, Ukrinform and Ukrainian crisis media centre; and gave interviews on the national TV channels *(5 Channel, ICTV, the First Business, etc.)* and Radio stations *(Hromadske Radio, The First National, News)* channels.

3 GLOBAL WIND DAY 2016

Every year, on June 15, Global Wind Day, the UWEA holds events dedicated to the development of global and national wind energy industry. This year Global Wind Day was a special one – the world community celebrated its 10th anniversary.

On **15 June** the teleconference Minsk, Belarus – Kiev, Ukraine "Wind Power – a Key Tool Against Global Climate Change" was organised withen International technical assistance project "Removing barriers to wind energy development in Belarus" *(Ministry of Natural Resources and Environmental Protection of Belarus / UNDP-GEF)* by the Ukrainian Wind Energy Association, Scientific and Technical Centre Psycheya *(Ukraine)* and Green Network *(Belarus)*.

Leading wind power companies from both countries participated in the event. Wind experts discussed challenges and opportunities for the development of wind power technologies in Ukraine and in Belarus.

Denis Kovalenko, Project consultant: "Unfortunately, wind power development in Belarus is at the very early stage. Now in the country we have only several dozen wind turbines installed totalling just over 40 MW. However, the Government's plans for developing wind power in Belarus look very prospective."

Marina Bilous, Project manager: "Like Ukraine, Belarus faces technical problems including, first of all, modernisation of the entire energy system of the country that still has a certain legacy remaining from the Soviet Union. We need to improve our legislation to give a boost to the activities of possible investors and wind project developers".

Sergiy Sapegin, director of STC Psycheya and Andriy Konechenkov, UWEA Chairman, acted as event facilitators.

4 INTERNATIONAL FAIR WINDENERGY HAMBURG

International fair WindEnergy Hamburg and WindEurope Summit 2016 that took place in Hamburg on **27-30 September** were of great success with a superb range of speakers, delegates, and exhibitors. For the first time these two top wind industry events were held side-by-side. 1,436 exhibitors from 34 nations presented their innovative products and services, including many world premieres. The world's leading global wind industry expo is the only one to cover both the onshore and offshore sectors of the wind industry.

The UWEA was a media partner of WindEnergy Hamburg and organizer of the Ukrainian delegation participating in the fair. It's worth noting that the Ukrainian delegation was the largest among those of the post-Soviet states and from the Eastern Europe. The group was made up of 30 UWEA members including leading Ukrainian wind power companies, wind equipment manufacturers, law firms.

On 28 September 2016 while visiting the fair Consul General of Ukraine in Hamburg Ms. Oksana Tarasyuk met with members of the Ukrainian delegation and visited the stand of the Ukrainian companies Management Company Wind Parks of Ukraine and Fuhrlaender Windtechnology LLC. Information on the participation of the Ukrainian delegation in WindEnergy Hamburg was also posted on the official website of the Ministry of Foreign Affairs of Ukraine.

5 CONFERENCES

This has been an eventful year for the wind power sector at both the national and international levels. The key conferences in which the UWEA members participated Included he following:

INTEGRATION WITH EUROPEAN ENERGY SYSTEM

Ukraine needs to confirm to the Western partners of ENTSO-E Secretariat its commitment to fully integrate the Ukraine's Unified Energy System with the European one. This was one of the main messages from the scientific and practical conference "Synchronous operation of the Ukraine's Unified Energy System with ENTSO-E. Integration. Possibilities. Challenges" hosted by the All-Ukrainian Energy Assembly on **25-26 February** 2016 in Lviv.

Representatives from Ministry of Energy and Coal Industry of Ukraine, National Commission for State Regulation of Energy and Utilities, SE NEC Ukrenergo, energy companies and design institutes participated in the event.

Ivan Plachkov, Chairman of the Ukrainian Energy Assembly said: "All these years we all, each at his own level, has been contributing to improvement of the technical condition of our energy system and its competitiveness. The integration of our energy system with the European one will change the relationship between the natural monopolies and consumers. European integration vector will bring this relationship to a high European level; increase transparency of the energy market. Consumers will have clear and economically grounded tariffs for energy supply".

The participants defined a roadmap to strengthen Ukraine's energy market integration with the ENTSO-E.

Speaking at the conference Andriy Konechenkov, UWEA's Chairman noted: "Today's conference showed the electricity transmission system operators' intention to create a stable and competitive electricity market in Ukraine. It gives a positive signal to the market, indicating a willingness to integrate the Ukrainian energy system with the European one".

ROUND TABLE "NEW ENERGY"

Scientific and Technical Centre Psychea launched a series of expert analytical round tables "New Energy" dedicated to the analysis of the modern patterns and trends of the global and the Ukrainian power sectors.

The event was conduced on **2 March** 2016. Energy experts, representatives of governmental bodies and academic institutions working in the field of energy discussed the opportunities and prospects of development of various types of energy technologies in Ukraine.

In their speeches the UWEA experts emphasized the need to develop local energy resources as key instruments for energy independence.

WIND POWER POLAND 2016

The largest wind industry conference and exhibition for Central & Eastern Europe, organised by the Polish Wind Energy Association in cooperation with the European Wind Energy Association, took place in Warsaw on **7-9 March** 2016.

The European Wind Industry stands together to make the economic arguments for wind power in Poland, a market that faces increasing uncertainty. Giles Dickson, Chief Executive Officer of the European Wind Energy Association, said: "This is an excellent opportunity to reinforce the merits of wind technology in a market with huge potential for jobs, growth and industry".

Andriy Konechenkov, UWEA Chairman who participated in the conference, noted: "Reluctance to implement the latest technological solutions in the sector of "green" energy is often replaced by complicated and lengthy bureaucratic procedures for new projects initiated by politicians. The conference in Warsaw very clearly demonstrates how such steps discourage investments in potentially fast-growing sector of "green" energy".

CHERNOBYL +30

Two days ahead of the 30th anniversary of the Chernobyl catastrophe – on **24 April** 2016, Minsk, the capital of Belarus, hosted the international conference "Chernobyl + 30" held under the auspices of the Association "Green Network" with the support of the Kiev branch of Heinrich Böll Foundation *(Germany),* the World Wind Energy Association, European Green Party and the Belarusian party The Greens.

In her welcome speech at the opening ceremony the Secretary-General of the European Green Party *(EGP)* March Garcia Sanz expressed doubt that the mankind had learned the lessons of Chernobyl. "The accident has shown that commitment to nuclear power is a serious mistake; however, we continue to use this energy source," – she said. At the same time, she noted that renewable energy today "is not a luxury but a necessary transformation to ensure human well-being at the global scale."

The Forum discussed such issues as: the consequences of the Chernobyl NPP disaster, renewable energies development, energy conservation and energy efficiency, current trends in the EC Energy policy and possible strategies for energy sector in Belarus.

In his presentation, Andriy Konechenkov, Vice-President of the World Wind Energy Association, Chairman of the UWEA said: "The Paris Declaration provides for a reduction of GHG emissions and renewable energy is an internationally accepted tool for achieving the goal. Today myths about "high prices of "green" energy make no sense. It is necessary to develop RES as quickly as possible to address issues of the global energy security".

ENERGY SPRING IN KIEV

On **26 May** 2016 Kiev hosted Energy Congress ENERGY SPRING 2016 – the most relevant and influential event devoted to the trends of Ukrainian markets of traditional and renewable energy as well as energy efficiency. At the Congress a newly appointed Minister of Energy of Ukraine Igor Nasalyk presented the strategy of the Ministry of Energy and Coal Industry on the development and optimization of specialized industries in the coming period.

The congress became the real platform for a dialogue between the government and business, uniting professionals from Ukraine and abroad. The final section of the Congress *(the Ukrainian Wind Energy Association was actively involved in its preparation)* was devoted to the development of renewable energies in the country. Andriy Konechenkov, Chairman of the UWEA, George Geletukha, Chairman of the UABio and Alexei Habatyuk, Chairman of the supervisory board of the Green Investments Fund shared their visions of the prospects for the development of renewable energy and proposals for overcoming the existing barriers.

The Energy Congress “Energy Spring 2016” was organised by Nobles Fortune. The Ministry of Energy and Coal Industry of Ukraine acted as a co-organiser and the Ukrainian Wind Energy Association – as a partner. More than 250 people participated in the event.

WIND INDUSTRY – A KEY INSTRUMENT OF NEW EUROPEAN ENERGY MARKET

WindEurope Summit 2016 took place at the Congress Centre Hamburg on **27-29 September,** was of great success with a superb range of speakers, delegates, exhibitors. Its extensive programme included presentations and lectures by some 500 experts across 50 sessions, with the overall theme "Making transition work." Whether it was technology or market developments, policy, finance, costs, public acceptance, repowering, storage, digitisation, and electrification of transport/heating, corporate PPAs or the implications of Brexit – the WindEurope Summit 2016 covered it all.

Giles Dickson, CEO of WindEurope, said: "Wind energy is no longer a nice-to-have add-on in the power mix. It's a mainstream and essential part of electricity supply, now able to meet up to 12% of Europe's power needs. It has also become a mature and significant industry in its own right, now providing 330,000 jobs and billions of euros of European exports."

Sigmar Gabriel and Maroš Šefčovič, Fatih Birol, Michael Liebreich, and Jeremy Rifkin – the WindEurope Summit 2016 features several of the world's most prominent new energy thought leaders and politicians.

Maroš Šefčovič, Vice-President of the European Commission, in charge of Energy Union, pointed out "All of us here today agree that the Energy Transition is a business case. It's not about Energy Transition, it's about economic transition." Commenting on the goals agreed at the UN Climate Summit in Paris, Šefčovič said: "We want to accelerate the success of renewables. Wind energy plays a key role in that. By 2030 at least 50% of electricity demand and 27% of total energy consumption is to be covered by renewables. It is quite clear that this is the only way forward."

"WindEurope Summit 2016 and WindEurope Hamburg have become not only the key events in the global renewable energy industry. These top events have also confirmed the strategic importance of the wind energy for the EC energy transition", said Andriy Konechenkov, Chairman of the UWEA. "In connection with the transition of Ukraine to a new energy market, wind power industry in our country is to become one of the strategic directions for the development of the future national energy sector following the EU energy policy", Konechenkov stressed.

SEF-2016 KYIV

The Eighth International Sustainable Energy Forum and Exhibition "SEF 2016 KYIV" was successfully held on **11-12 October** in Kyiv. Main topics were devoted to the conditions of doing business in Ukraine in renewable energy and energy efficiency fields taking into account recent changes in the national legislation, funding programmes in these sectors and development of a business model of interaction with state authorities.

Special focus sessions were devoted to energy efficiency solutions for companies, the latest trends and characteristics of different types of renewable energy in Ukraine, sustainable energy in the transport sector.

The Forum was attended by Head of the State Agency on Energy Efficiency and Energy Saving Sergei Savchuk, Minister of Ecology and Natural Resources of Ukraine Ostap Semerak, Hans-Josef Fell, President of Watch Energy Group, former member of the Bundestag, representatives of Ukrainian and foreign companies operating in the sector of RES and energy efficiency, Ukrainian and international energy experts.

In his welcoming speech Mr. Sergiy Savchuk noted: "For the last heating seasons we managed to reduce and replace totally 7.2 bln m^3 of natural gas for which we did not pay either to the west or the east. I think we need to continue and expand such efforts. Together with the business community, non-governmental organizations and authorities we should improve and finalize our regulatory framework to enable the safe investments and easy projects implementations".

"In fact, we live in a unique time. Ukraine is the first country in Europe, which has signed and ratified the Paris agreement. The agreement aims at strengthening the ability to deal with climate change and renewable energy plays a "critical role" in stalling global carbon emissions", stressed Minister of Ecology and Natural Resources of Ukraine Ostap Semerak.

WWEC 2016 TOKYO

On **31 October – 2 November,** 2016, Tokyo, Japan hosted the 15th World Wind Energy Conference "Concentrating Efforts for Wind Power Generation in Japan and Worldwide" organised by the World Wind Energy Association and the Japanese Wind Power Association. A total of 500 participants from 33 countries attended the three-day Conference.

The Conference addressed all aspects of wind utilisation, science and technology, related policies, manufacturing, development, operation, community involvement as well as other economic and social issues.

The significance to the world of the agreement reached at the Paris UN Climate Change Conference was noted by representatives of the government of Japan, many speakers from Japan and other countries. The Paris Agreement paves the way for a 100 % renewable energy future for the world.

Representatives of the Ukrainian Wind Energy Association were actively involved in the event. They moderated two conference sessions, one of which was devoted to new wind projects implemented in the emerging markets, the second one – a study conducted in the field of offshore wind turbines.

COP 22. MARRAKECH

The 22nd Session of the Conference of the Parties *(COP 22)* to the UN Framework Convention on Climate Change *(UNFCCC)* was held in Marrakech, Morocco from **7-18 November** 2016. 48 countries declared their readiness for implementation of their ambitious plans for the transition to 100% RES by 2050. Long-term funding to combat climate change was one of the main issues discussed by more than 20 thousand delegates from 196 countries. National representatives appealed for the complete rejection of the use of coal – one of the main sources of global warming.

On the eve of the Marrakesh conference Ukraine national NGOs developed the list of clear requirements to the official delegation of Ukraine to COP22, including adoption of the national policy for the gradual transition to 100% RES; implementation of public education on climate change issues.

Successful was a seminar "EU Enlargement: Advancing Climate Ambitions" organised as the COP 22 side event by Heinrich Böll Foundation. In his presentation Andriy Konechenkov, UWEA Chairman, addressed factors that affected the RE development and large-scale investments in the "green" energy.

SYSTEMS OF GUARANTEED POWER SUPPLY AND AUTOMATION

The fifth electrical industry conference "Systems of guaranteed power supply and automation – 2016", organized by the magazine Seti & Business took place on **23 November.** For the third year in a row the UWEA as an official information partner participate in the opening ceremony.

The Conference topics included renewable energy, automation and process safety, design and implementation of energy-efficient systems, and industry solutions based on electrical equipment.

Andriy Konechenkov, UWEA Chairman, devoted his presentation to wind energy utilization. "This is one of the fastest growing industries in the world. This is not surprising, because the wind is a local resource for which you do not need to pay. Wind farms do not consume water resources, do not pollute, do not produce any smoke and do not emit carbon dioxide to the atmosphere, explained Andriy Konechenkov. – Instead, wind energy creates new jobs".

6 ENVIRONMENTAL IMPACTS OF WIND POWER

Issues related to the wind farm impact on the environment, flora and fauna remain the main focus of the association. The UWEA experts held numerous meetings with representatives of environmental organizations and local communities, first of all, in the regions where wind farms operated or planned for construction; organised round tables and participated in public hearings devoted to future wind development.

For closer cooperation with leading environmental educational and research institutions of Ukraine, in particular: Melitopol State Pedagogical University named after Bogdan Khmelnitsky, Azov-Black Sea Ornithological Station and Scientific Centre "Biodiversity" a Memorandum of Cooperation and Partnership was signed. *(See Chapter "Enhancing Partnerships")*

ASSESSMENT AND CONSERVATION OF NATURAL SYSTEMS ON THE TERRITORIES OF MODERN WIND FARMS

On **19 October** 2016 a Working Group meeting devoted to the implementation of modern technologies on assessment and conservation of natural systems on the territories of modern wind farms was held by a scientific and educational centre Biodiversity of the Melitopol Pedagogical University named after Bohdan Khmelnytsky *(SEC Biodiversity)* at the Botievo wind farm in Zaporizhzhya region.

The event supported by the Ukrainian Wind Energy Association and the company Wind Power, owner of the Botievo Wind Farm, aimed at extending the natural systems monitoring experience successfully gained at the Botievo wind site to other wind farm projects in Ukraine. The participants discussed the progress of contemporary monitoring researches of the natural complexes.

In his speech, Valery Siohin, director of SEC Biodiversity, presented a strategic approach to the monitoring of birds and their transcontinental seasonal migration at all stages of the wind project including development, construction and operation. "It is the stage of early development when the preliminary expert report on birds and natural complexes should be developed to determine the possibility of a wind farm construction in the area", noted he.

Experts from SEC Biodiversity – Peter Gorlov, a head of technological areas biodiversity monitoring laboratory and a researcher Alexander Annenkov, presented their own technologies for assessment of a wind power plant impact on seasonal bird complexes and birds migration.

Participants also visited a monitoring centre located on the island Biruchiy, the Azov-Sivash National Park, where they were presented the results of natural system investigations being conducted with the use of the modern authors' technologies.

"Development and construction of any energy facilities should strictly observe environmental legislation, both national and international. Such events as we have today are very important not only for experts, but also for the public who wants to know more about modern wind technologies and their possible impact on the environment", said Andriy Konechenkov, Chairman of the UWEA, Vice-President of the WWEA.

7 ENHANCING PARTNERSHIPS

Last year one of the main activities of the Ukrainian Wind Energy association included enhancing partnership with leading Ukrainian energy sector organisations and institutions to find practical solutions to the challenges the Ukrainian wind energy sector faced. The effect of such policy has resulted in signing several Memoranda of Cooperation and Partnership with different organisations.

MEMORANDUM OF COOPERATION AND PARTNERSHIP WITH ASSOCIATION "UKRHYDROENERGO"

The ceremony of signing a Memorandum of Partnership and Cooperation between two Ukrainian public organizations "Association Ukrhydroenergo and the Ukrainian Wind Energy Association was held on 7 April 2016 in Kyiv.

By signing the Memorandum the Parties confirmed their readiness to increase their cooperation based on priority and equality principles, in developing the well-functioning Ukrainian energy market, in promoting best practices and experiences of utilization of hydro and wind technologies for electricity generation and developing local manufacture of hydro and wind equipment.

Wind and hydro are the key renewable technologies. The combination of hydro and wind power capacities in national energy mix significantly improves the grid stability. Therefore, two associations are planning to develop joint projects demonstrating the use of hydro and wind technologies. Experts from the Association Ukrhydroenergo also stressed the importance of participation of professional associations in the legislative process.

The UWEA Chairman Andriy Konechenkov noted: "Involvement of professional associations in a process of designing on a new energy market will resolve the complex of issues related to the transition to a new energy system based on large-scale utilization of local energy sources".

MEMORANDUM OF COOPERATION AND PARTNERSHIP WITH LEADING FLORA & FAUNA EXPERTS OF UKRAINIAN

On 11 July a Memorandum of Cooperation and Partnership was signed between the UWEA and Melitopol State Pedagogical University named after Bogdan Khmelnitsky, Azov-Black Sea Ornithological Station and Scientific Centre Biodiversity.

The Parties confirmed their intention to make every effort to establish more productive cooperation aimed at promoting renewable energy in Ukraine.

The Parties identified a set of measures to prevent and/or eliminate negative impacts of economic activities on environment, to ensure compliance with environmental legislation and to preserve natural systems by conducting constant researches and wind farm monitoring.

Interaction with leading flora and fauna experts is of a paramount importance for the successful implementation of wind projects. "In addition to providing local communities with clean electricity and new jobs, wind energy creates comfortable living conditions for future generation without harming the environment", stressed Andriy Konechenkov, UWEA Chairman.

MEMORANDUM OF COOPERATION AND PARTNERSHIP WITH YUZHNY MACHINE-BUILDING PLANT

On the eve of the 25th anniversary of Independence Day of Ukraine the UWEA and State Enterprise "Production Association Yuzhny Machine-Building Plant named after A.M. Makarov" concluded a Memorandum of Cooperation and Partnership. The Memorandum aims at developing wind industry in Ukraine in line with modern international standards, including production and maintenance of licensed wind turbines, implementation of wind projects in cooperation with other wind companies active in the national wind market.

The UWEA welcomed the signing of the Memorandum: "Cooperation between specialists of the most powerful engineering enterprise of Ukraine – Yuzhny Machine-Building Plant and national experts of the leading wind energy companies – UWEA members will help to prevent barriers and overcome obstacles to the modern wind industry development".

MEMORANDUM OF COOPERATION AND PARTNERSHIP WITH NATIONAL AVIATION UNIVERSITY OF UKRAINE

Memorandum of cooperation and partnership between the UWEA and the National Aviation University of Ukraine was signed on 29 July. Within the framework of the Memorandum the Parties confirmed their intention to cooperate through interaction, exchange of experience and joint assessments of the wind farm impacts on the environment, which are aimed at accelerating renewable energy development in Ukraine.

MEMORANDUM OF COOPERATION AND PARTNERSHIP WITH ALL-UKRAINIAN SUSTAINABLE DEVELOPMENT AND INVESTMENT AGENCY

Recognizing the need for cooperation as an effective instrument in shaping the modern strategies for wind, solar and hydrogen energies development, a Memorandum of Cooperation and Partnership between the UWEA and All-Ukrainian Sustainable Development and Investment Agency was concluded on 31 August.

Main areas of cooperation include the exchange of information on implementation of wind, solar and hydrogen technologies, including best international practices, and development of joint products aimed at sustainable Ukrainian energy sector development.

Within the framework of the Memorandum the interactive investment map of Ukraine UA MAP, a unique web-source, has been created. The map contains detailed information about energy efficiency and renewable energy projects, which have been implemented in the past, are currently implemented, and prospective projects that require investments.

UWEA's MEMBERS

SIEMENS

Vestas

Fuhrländer ВИНДТЕХНОЛОДЖИ

DTEK

Wind parks of Ukraine

VINDCRAFT UKRAINA

GÜRİŞ

EKO ОПТИМА

СИВАШЭНЕРГОПРОМ

GRESA group 1991

KONKORD GROUP

WE WIND ENERGY PROJECT LLC

DNV·GL

GEO NET

WindGuard

METROPOLIYA SCIENCE AND TECHNOLOGY COMPANY

DENTONS

Asters

SAYENKO KHARENKO

SPENSER & KAUFFMANN ATTORNEYS AT LAW

AMAI CEE Insurance Brokers

юридична компанія ПРАВОЗАХИСТ УКРАЇНА

HEAVY IS EASY! HOLLEMAN

DEALEX WE CARE

TeplodarPV

Екозахист професійні екологічні послуги

UWEA

UKRTOWER

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Українське вітроенергетичне агентство – Ваш надійний інформаційний партнер у світовій вітроенергетичній промисловості

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