

# Report on the Promotion and Use of Energy from Renewable Sources in Ukraine in the years of 2018-2019

## 1. Sectoral shares, overall shares and actual consumption of energy from renewable sources in the preceding 2 years (Article 22(1)a of Directive 2009/28/EC).

The share of energy from renewable sources in the final consumption in Ukraine in the years of 2018-2019 was calculated pursuant to the SHARES program, developed by Eurostat.

**Table 1. Sectoral (electricity, heating and cooling systems, and transport) shares of energy from renewable sources and overall shares of energy from renewable sources**

(according to the data from the Energy Balance developed by the State Statistics Service)

	2018	2019
Renewable sources in heating and cooling systems (%)	7,97	9,02
Renewable sources in power industry (%)	8,92	10,86
Renewable sources in transport sector (%)	2,20	3,07
<b>Overall share of renewable sources (%), including:</b>	<b>7,01</b>	<b>8,06</b>
<i>Borrowings within the framework of interstate cooperation (%)</i>		
<i>Surplus for interstate cooperation (%)</i>		

including the data on capacity and energy production by heat pumps (calculated in accordance with the Methodology for calculation of the share of energy produced by heat pumps from renewable sources approved by the order of the Ministry of Regional Development, Construction and Communal Services of Ukraine dated March 12, 2018, No. 52, registered with the Ministry of Justice of Ukraine as of April 03, 2018 No. 395/31847)

**Table 1a. Calculation table of sectoral share of energy from renewable sources in the gross final energy consumption (ktoe)**

(according to the data from the Energy Balance developed by the State Statistics Service)

	2018	2019
(A) Gross final consumption of energy from renewable sources in heating and cooling systems	2 739,0	2854,0
(B) Gross final consumption of energy from renewable sources in electricity	1 120,6	1340,0
(C) Gross final consumption of energy from renewable sources in the transport sector*	84,5	137,2
<b>(D) Total gross consumption of energy from renewable sources</b>	<b>3 944</b>	<b>4331,3</b>
(E) Transmission of energy from renewable sources to other Contracting Parties or Member States		
(F) Transmission of energy from renewable sources from other Contracting Parties and to third parties		
(G) Target-adjusted consumption of energy from renewable sources (D)-(E)+(F)		

\*- including the coefficient of renewable energy use by railway transport - 2,5.

**Table 1.b Overall actual share (installed capacity, gross electricity production) of each renewable energy technology in Ukraine for achievement of 2020 mandatory targets and indicative intermediate trajectory of achieving the share of energy from renewable sources in power generation**

(according to the data from the Energy Balance developed by the State Statistics Service)

	2018		2019	
	MW	GW*h	MW	GW*h
Hydro power plants <sup>1</sup> :	6 229	12 005	6 340	7 854,8
non-storage <sup>(2)</sup> :	4 719	10 426 (10 964,4)	4 830	6 508 (10 821,6)
<i>rated below 1 MW</i>	40	102	50	110
<i>rated 1-10 MW</i>	59	140	64	132
<i>rated above 10 MW</i>	4 620	10 184	4 716	6 266
<i>storage</i>	1 510	1 579,0	1 510	1 346,8
<i>mixed</i> <sup>3</sup>				
Geothermal power plants				
Solar power plants	1 388	1 107,5	4 925	2 932,8
<i>photovoltaic</i>	1 388	1 107,5	4 925	2 932,8
<i>concentrated solar power plants</i>				
Tidal power, wave, ocean power plants				
Wind farms <sup>(4)</sup> :	533	1 188 (1 209,5)	1 170	2 020 (1 994,3)
<i>onshore</i>	533	1 188 (1 209,5)	1 170	2 020 (1 994,3)
<i>offshore</i>				
Biomass:	97	300,5	170	406,9
<i>solid</i>	51	124,5	84	194,9
<i>biogas</i>	46	176	86	212,0
<i>bioliquids</i>				
<b>TOTAL (including normalization)</b>	<b>8 403</b>	<b>14 588 (15 223,9)</b>	<b>12 605</b>	<b>13 214,5 (17 502,4)</b>
<b>Without PSPPs (including normalization)</b>	<b>6 893</b>	<b>13 009 (13 582,2)</b>	<b>11 095</b>	<b>11 867,7 (16 155,6)</b>
<i>of which CHPPs</i>				

not including renewable energy installations located in the occupied territory of the AR Crimea, with a total capacity of 494,87 MW, of which: solar power plants – 407,09 MW, wind farms – 87,768 MW.

<sup>1</sup> Normalized pursuant to Directive 2009/28/EC and Eurostat methodology.

<sup>2</sup> Normalized pursuant to Directive 2009/28/EC and Eurostat methodology.

<sup>3</sup> Pursuant to the new Eurostat methodology.

<sup>4</sup> Normalized pursuant to Directive 2009/28/EC and Eurostat methodology.

**Table 1c. Overall actual shares (final energy consumption<sup>5</sup>) of each renewable energy technology of Ukraine for achievement of 2020 mandatory targets and indicative intermediate trajectory of achieving the share of energy from renewable sources in heating and cooling systems (ktoe)**  
(according to the data from the Energy Balance developed by the State Statistics Service)

	2018	2019
Geothermal energy (other than heat pumps)	-	-
Solar energy	<b>0,6</b>	<b>0,6</b>
Biomass:	<b>2 673,6</b>	<b>2785,4</b>
<i>solid</i>	2 652,1	2764,8
<i>biogas</i>	21,5	20,7
<i>bioliquids</i>		
Renewable energy from heat pumps, including:	<b>64,7</b>	<b>68,0</b>
- aerothermal	37,2	37,9
- geothermal	17,2	18,8
- hydrothermal	10,4	11,3
<b>TOTAL</b>	<b>2 739,0</b>	<b>2854,0</b>
<i>of which in centralized systems</i>		
<i>in private households</i>	1812,2	1857,1

**Table 1d. Overall actual shares of each renewable energy technology of [Contracting Party] for achievement of 2020 mandatory targets and indicative intermediate trajectory of achieving the share of energy from renewable sources in the transport sector (ktoe)**  
(according to the data from the Energy Balance developed by the State Statistics Service)

	2018	2019
Bioethanol/ethyl tertiary butyl ether made of bioethanol	37,24	88,1
<i>including biofuels under Article 21.2</i>	-	
<i>including imported</i>	-	
Biodiesel fuel	-	
<i>including biofuels under Article 21.2</i>	-	
<i>including imported</i>	-	
Hydrogen from renewable sources	-	
Electric power from renewable sources (with 2,5 coefficient)	47,29 (102,03)	49,12 (108,84)
<i>including motor transport</i>	-	
<i>Energy from renewable sources consumed by railway transport (with 2,5 coefficients)</i>	36,49 (91,23)	39,81 (99,525)
<i>Energy from renewable sources consumed by other types of transport</i>	10,80	9,31
<i>including non-motorized transport</i>	-	
Other (biogas, vegetable oils, etc.) – specify	-	
<i>including biofuels under Article 21.2</i>	-	
<b>TOTAL (with 2,5 coefficient for energy from renewable sources consumed by railway transport)</b>	<b>84,53 (139,27)</b>	<b>137,23 (196,9)</b>

<sup>5</sup> Direct use and centralized systems pursuant to Article 5.4 of Directive 2009/28/EC.

2. Actions taken in the preceding 2 years and (or) those planned at the national level to promote increased generation of energy from renewable sources, taking into account the indicative trajectory of achieving the national targets for energy from renewable sources as indicated in your National Renewable Energy Action Plan. (Article 22(1)a of Directive 2009/28/EC)

**Table 2. Outline of key political actions and activities**

Action name and designation	Action type	Expected outcome	Target group and (or) type of activity	Existing or planned	Action start and end date
<b>2018</b>					
The Law of Ukraine dated December 05, 2017 No. 2222-VIII, "On Ukraine's accession to the Statute of the International Renewable Energy Agency (IRENA)"	regulatory	Ukraine's membership in the International Renewable Energy Agency (IRENA)	International community, International investors, Ministries and other central executive authorities,	existing	Enacted: January 07, 2018  Full member of IRENA since February 24, 2016
The Law of Ukraine dated November 23, 2018 No. 2628-VIII "On amendments to Tax Code of Ukraine and certain other legislative acts of Ukraine on improving administration and revision of rates of certain taxes and duties"	regulatory	It is allowed to place renewable energy facilities on lands of industry, transport, communications, energy, defense without changing their designation. Certain imports into the customs territory of Ukraine will be temporarily (until December 31, 2022) exempt from value-added tax: - electric vehicles; - wind turbines; - solar photovoltaic panels; - inverters with over 7.5 kW capacity;	Local executive authorities, investors, renewable energy market players	existing	Enacted: January 01, 2019

		- transformers with 10 MW capacity.			
The Law of Ukraine dated September 4, 2018 No. 2517-VIII "On amendments to certain laws of Ukraine concerning the investment attractiveness of the construction of renewable energy facilities"	regulatory	Improving legislation to remove administrative barriers and increase the investment attractiveness of the sector of electricity production from alternative energy sources	Investors, producers of energy from renewable sources	existing	Enacted: October 04, 2018
Decree of the Cabinet Ministers of Ukraine dated June 06, 2018 No. 497-p "On approval of the Action plan for the implementation of the "Energy sector reform (up to 2020)" of the Energy strategy of Ukraine until 2035 "Safety, energy efficiency, competitiveness"	regulatory	Action plan for the implementation of the "Energy sector reform (up to 2020)" of the Energy strategy of Ukraine until 2035 "Safety, energy efficiency, competitiveness"	Ministries and other central executive authorities	existing	Enacted: June 06, 2018
NEURC Resolution dated March 14, 2018 No. 307 "On approval of Market Rules"	regulatory	Defines the procedure for registration of market players, the procedure and requirements for ensuring the fulfillment of obligations under relevant agreements, and other issues related to the functioning of the Ukrainian electricity market.	Electricity market players: producers; traders; distribution system operators; transmission system operators; market operator; guaranteed buyer; consumers.	existing	Enacted: July 01, 2019

<p>NEURC Resolution dated March 14, 2018 No. 308 "On approval of the Day-Ahead Market and Intra-day Market Rules"</p>	<p>regulatory</p>	<p>Defines the relationships arising between "day-ahead" and "intra-day" market players (DAM/IDM player) and market operator (MO) as well as the registration procedure for DAM/IDM players, the procedure and requirements for ensuring the fulfillment of obligations under power purchase and sale agreements in the "day-ahead" and "intra-day" markets, the procedure for organizing and conducting DAM and IDM auctions, the procedure for determining the price of electricity, performing calculations in DAM/IDM, determining the cost of MO services and the procedure for their payment, releasing information and disclosing information, the procedure for resolving disputes between MO and DAM/IDM players.</p>	<p>Market operator, "day-ahead" and "intra-day market" players</p>	<p>existing</p>	<p>Enacted: July 01, 2019</p>
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NEURC Resolution dated March 14, 2018 No. 309 "On approval of the Transmission System Code", NEURC Resolution dated March 14, 2018 No. 310 "On approval of the Distribution System Code"	regulatory	Standardizes the issues of rights, obligations and responsibilities of electricity market players regarding operation and maintenance of electric installations of electricity generating facilities (including those using renewable energy sources), ensuring the safety of electricity supply, its proper quality and availability.	All electricity market players	existing	Enacted: April 19, 2019
NEURC Resolution dated March 14, 2018 No. 311 "On approval of the Code of commercial electricity metering"	regulatory	Provides for commercial electricity metering in the electricity market, in particular the features of installing metering nodes for electricity generating installations of private households intended for electricity generation from alternative energy sources as well as metering nodes at power plants and substations that generate electricity from alternative energy sources	All electricity market players, commercial metering administrator and suppliers of commercial electricity metering services.	existing	Enacted: April 19, 2019
NEURC Resolution dated March 14, 2018 No. 312 "On approval of the Retail Electricity Market Rules"	regulatory	Standardizes the issues of electricity generation from solar radiation and/or wind energy by domestic consumers (electricity generating installations of private households) and relevant contractual support	Domestic consumers, private households with electricity generating installations, universal services providers	existing	Enacted: April 19, 2019

NEURC Resolution dated December 27, 2017 No. 1467 "On approval of Licensing terms for conducting economic activity of electricity generation"	regulatory	Compliance with the requirements of the Licensing terms for electricity generation	Licenses conducting economic activity of electricity generation	existing	Enacted: August 21, 2018, effective: July 01, 2019
NEURC Resolution dated December 27, 2017 No. 1471 "On approval of Licensing terms for conducting economic activity for the fulfillment of functions of a guaranteed buyer"	regulatory	Compliance with the requirements of the licensing terms by a guaranteed buyer related to the purchase of electric energy released by producers engaged in the production of electric energy from renewable sources	Guaranteed buyer, producers operating under the feed-in tariff, as well as producers who have acquired the right based on auction results	existing	Enacted: August 21, 2018, effective: July 01, 2019
NEURC Resolution dated December 18, 2018 No. 1965 "On approval of the Methodology (procedure) for calculating the fee for connection to transmission system and distribution system"	regulatory	Establishes the procedure for calculating the fee for connecting customers' electric installations to the electricity grids of the transmission and distribution systems, increasing the value of the available connected capacity of electric installations	All electricity market players	existing	Enacted: December 22, 2018
NEURC Resolution dated December 28, 2018 No. 2069 "On approval of payment rates for non-standard connection of capacity and payment rates for the linear part of connection for the year of 2019"	regulatory	Approves payment rates for non-standard connection of capacity and payment rates for the linear part of connection for the year of 2019 for all distribution system operators.	All electricity market players	existing	Enacted: January 22, 2019
NEURC Resolutions dated August 28, 2018 No. 895, dated September 11, 2018 No. 987 and dated December 04, 2018 No. 1613 "On	regulatory	Establish transparent rules and conditions for holding open discussions of draft resolutions	Investors, producers of energy from renewable sources	existing	Enacted: September 20, 2018, September 22, 2018,



amendments to the Procedure for holding open discussion of draft resolutions of the National Energy and Utilities Regulatory Commission"					December 28, 2018
Government program "Tepli kredyty" ("Warm loans")  State support for thermal modernization of dwellings in Ukraine (Resolution of the Cabinet of Ministers of Ukraine dated October 17, 2011 No. 1056 "Some issues of funds use in the area of energy efficiency and energy saving", as amended, and Resolution of the Cabinet of Ministers of Ukraine dated March 1, 2010 No. 243 "On approval of the State target economic program for energy efficiency and development of the energy sector for renewable energy sources and alternative fuels for the years of 2010-2020")	financial	Stimulating population to engage into energy efficient activities	Manufacturers and suppliers of equipment producing thermal energy from renewable sources of energy, population, apartment building co-owners associations, house development cooperatives	existing	Enacted: May 06, 2015  Validity period: 2020

Arrangement of specialized exhibit dedicated to alternative energy sources "Biofuels" within the framework of the XXX International Agro-Industrial Exhibition "AGRO-2018"	Organizational and information	Enhancing awareness regarding modern technologies, machinery and equipment for biofuel production	- enterprises using renewable energy sources, - enterprises producing biological feedstock - academic institutions	Organizational and information	June 06 - 09, 2018
First EU - Ukraine Renewable Energy Investment Forum	Organizational and information	The high-level bilateral event enabled to share the European experience in the area of renewable energy market development and identify the best ways to promote the "green" energy development in Ukraine.	Representatives of government authorities, designated associations, businesses as well as experts from IRENA, the European Commission, EBRD, IFC and other international organizations.	Organizational and information	December 18, 2018
<b>2019</b>					
The Law of Ukraine dated April 13, 2017 No. 2019-VIII "On electricity market"	regulatory	Introduction of the electricity market.	All electricity market players	existing	Enacted: June 11, 2017 Introduction of the electricity market: July 01, 2019
The Law of Ukraine dated April 25,	regulatory	State support delivery to	Producers of energy	existing	Enacted: May

<p>2019 No. 2712-VIII "On amendments to certain laws of Ukraine on ensuring competitive conditions for production of electricity from alternative energy sources"</p>		<p>economic entities in the field of renewable energy exclusively through auctions for the distribution of quotas, which will ensure the development of alternative energy in a more controlled and efficient way and reduce the financial burden on consumers and the threat of violation of the operational security of the IPS of Ukraine in future</p>	<p>from renewable sources</p>		<p>22, 2019</p>
<p>Resolution of the Cabinet of Ministers of Ukraine dated April 17, 2019 No. 324 "On the establishment of state enterprises "Guaranteed Buyer" and "Market Operator"</p>	<p>regulatory</p>	<p>Established state enterprises "Guaranteed Buyer" and "Market Operator". The "Guaranteed buyer" and "Market Operator" are the legal successors of the property, rights and obligations of the State Enterprise "Energorynok" in accordance with the distribution balance sheets.</p>	<p>Guaranteed buyer, Market operator, Electricity producers operating under the feed-in tariff,</p>	<p>existing</p>	<p>Enacted: April 20, 2019</p>
<p>Resolutions of the Cabinet of Ministers of Ukraine dated May 22, 2019 No. 454 "On approval of the Charter of the State Enterprise "Guaranteed Buyer" and dated May 22, 2019 No. 455 "On approval of the Charter of the State Enterprise "Market Operator"</p>	<p>regulatory</p>	<p>Approval of the Charter of the State Enterprise "Guaranteed Buyer", which was established to ensure purchase of all electric energy produced at electricity generation facilities that use alternative energy sources. Approval of the Charter of the State Enterprise "Market</p>	<p>Guaranteed buyer, Market operator Electricity producers operating under the feed-in tariff,</p>	<p>existing</p>	<p>Enacted: June 01, 2019</p>

		Operator" to ensure functioning of the "day-ahead" and "intra-day" electricity markets, organization of purchase and sale of electricity in such markets.			
Resolution of the Cabinet of Ministers of Ukraine dated December 27, 2019 No. 1175 "On the implementation of competitive conditions for production of electricity from alternative energy sources"	regulatory	<p>1. Approval of the Procedure for holding auctions for the distribution of support quotas, which defines the procedure for preparing and holding an auction for the distribution of support quotas to stimulate electricity producers from alternative energy sources</p> <p>2. Approval of the Procedure for selecting operators of electronic platforms for holding auctions for the distribution of support quotas.</p>	Economic entities intended to produce and/or produce electricity from alternative energy sources	existing	Enacted: January 31, 2020
NEURC Resolution dated April 26, 2019 No. 641 "On approval of regulatory legal acts regulating activities of a guaranteed buyer and purchase of electricity at a "feed-in" tariff and at an auction price"	regulatory	<p>1. Approval of the Procedure for purchase of electricity produced from alternative energy sources by the guaranteed buyer.</p> <p>2. Approval of the Methodology for preparing the guaranteed buyer's estimate, which regulates relations regarding financing of the guaranteed</p>	Producers of electricity at a "feed-in" tariff, potential producers, auction winners, guaranteed buyer, suppliers of electricity performing a function of a universal service suppliers (hereinafter	existing	Enacted: July 01, 2019

		<p>buyer's activities.</p> <p>3. Approval of a Standard contract for the purchase and sale of electricity at a "feed-in" tariff.</p> <p>4. Approval of a Standard service agreement to ensure an increase in the share of electricity production from alternative sources.</p>	<p>referred to as the "USS"), transmission system operators (hereinafter referred to as the "TSO") and commercial metering administrators.</p>		
<p>NEURC Resolution dated August 30, 2019 No. 1817 "On approval of the procedure for establishment, adjustment and termination of the "feed-in" tariff for electricity for economic entities, electricity consumers, including energy cooperatives and private households, whose electricity generating installations produce electricity from alternative energy sources"</p>	Regulatory	<p>Improvement of the procedure for establishment, adjustment and termination of the "feed-in" tariff for electricity for economic entities and private households</p>	<p>economic entities, electricity consumers, including energy cooperatives, private households, whose electricity generating installations produce electricity from alternative energy sources</p>	Existing	<p>Effective: September 15, 2019</p>
<p>NEURC Resolution dated November 26, 2019 No. 2529 "On approval of amendments to the NEURC Resolution dated December 10, 2015 No. 2932 "On approval of the procedure for determining the level of use of equipment manufactured in Ukraine at power plants, including the commissioned construction stages of power plants</p>	Regulatory	<p>Application of a mechanism for stimulating the production of electricity from renewable energy sources in a form of a "feed-in" tariff premium for economic entities which have gained the right to support of electricity production from alternative energy sources based on the results of an auction for</p>	<p>Economic entities that have obtained a license to pursue economic activities of electricity production from renewable energy sources.</p>	Existing	<p>Effective: December 06, 2019</p>

(start-up facilities) producing electricity from alternative sources of energy (with the exception of blast furnace and coke gas, and using hydropower – only micro, mini and small hydropower plants) and setting an appropriate "feed-in" tariff premium"		the distribution of support quotas, as well as bringing the current regulatory act in line with the current legislation and regulatory legal acts approved by NEURC.			
Government program "Tepli kredyty" ("Warm loans") State support for thermal modernization of dwellings in Ukraine (resolution of the Cabinet of Ministers of Ukraine dated October 17, 2011 No. 1056 "Some issues of funds use in the area of energy efficiency and energy saving", as amended, and Resolution of the Cabinet of Ministers of Ukraine dated March 1, 2010 No. 243 "On approval of the State target economic program for energy efficiency and development of the energy sector for renewable energy sources and alternative fuels for the years of 2010-2020")	financial	Stimulation of population to engage into energy efficient activities	Manufacturers and suppliers of equipment producing thermal energy from renewable sources of energy, population, apartment building co-owners associations, house development cooperatives	existing	Enacted: May 06, 2015  Validity period: 2020
International conference dedicated to the "Auction system for support of renewable energy sector in	Organizational and information	Introduction of a new auction system for stimulating the development of renewable	Renewable energy market players, IRENA experts,	Organizational and information	February 21, 2019

Ukraine"		energy sector in Ukraine and its impact on the country's economy.	representatives of the European Commission, the Energy Community, EBRD, IFC and other international organizations		
Arrangement of specialized exhibit dedicated to alternative energy sources "Biofuels" within the framework of the XXXI International Agro-Industrial Exhibition "AGRO-2019"	Organizational and information	Enhancing awareness regarding modern technologies, machinery and equipment for biofuel production	- enterprises using renewable energy sources, - enterprises producing biological feedstock - academic institutions	Organizational and information	June 04 - 07, 2019
X International Renewable Energy Investment Forum	Organizational and information	Shaping a conscious public attitude to the need for efficient use of fuel and energy resources and renewable energy sources.	Investors, end users, government authorities (Production of energy from renewable sources and alternative fuels).	Organizational and information	November 28, 2019

\* Please specify whether the event is (mostly) regulatory, financial, or organizational and information one (for example, an information campaign).

\*\* Does the expected outcome lead to a change in behavior, installed capacity (MW; t/year), generated energy (thousand toe)?

\*\*\* Who are the target individuals: investors, end users, public administration, planners, architects, mounters, etc? Or what is the target type of activity/sector: biofuel production, use of animal manure for energy purposes, etc?

\*\*\*\* Does this activity replace or supplement the activities specified in Table 5 of the National Renewable Energy Action Plan?

According to the Action Plan for implementation of Directive 2009/28/EC, the official websites of ministries and regional state administrations continuously highlight information about the support provided to implementation of activities aimed at generation of energy from renewable sources, as well as the benefits, cost, and energy efficiency of the equipment and systems operating with the use of renewable sources of energy.

The central and local executive authorities as well as local self-governance authorities are reporting on a quarterly basis to the State Agency on Energy Efficiency and Energy Saving about the renewable energy promotional activities conducted, as well as the meetings, round tables, public hearings, forums, conferences, public service announcements arranged with the aim of increasing the amount of energy obtained from renewable sources and alternative fuels in the country.

In addition, in the years of 2016-2017 the international technical assistance programs promoted elaboration of manuals for highlighting technical, legal, organizational, environmental, financial and economic, as well as social aspects of renewable energy projects implementation, including:

- Series of manuals on use of biomass as fuel in a municipal sector (UNDP Project “Development and commercialization of bio-energy technologies in the municipal sector of Ukraine”);
- Manuals on comprehensive analysis of the Ukrainian markets of pellets and biomass boilers (UNDP Project “Development and commercialization of bio-energy technologies in the municipal sector of Ukraine”);
- Guidance on technologies selection “The best available technologies for housing and utilities sector of Ukraine”, 2016 (USAID Project “Municipal energy reform in Ukraine”);
- Practical guide “Preparation and implementation of projects on replacement of natural gas with biomass for heat generation in Ukraine”, 2016 (prepared by NGO “Agency for renewable energy” (ARE) within the framework of USAID Project “Municipal energy reform in Ukraine”).



**2.a. Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of energy from renewable sources. (Article 22(1)e of Directive 2009/28/EC)**

During the years of 2018-2019 the following regulatory acts were adopted to promote growth of renewable energy sphere and improve administrative procedures:

1. The Law of Ukraine dated September 04, 2018, No. 2517-VIII «On amendments to certain laws of Ukraine regarding the investment attractiveness of renewable energy facilities construction», which has relaxed regulatory requirements for the construction of electric power facilities that produce electricity from alternative energy sources, in particular, for wind farms.

At the design stage, all construction facilities in Ukraine are classified in 3 categories of consequences with different requirements for each of them: facilities with insignificant (CC1), medium (CC2) and significant (CC3) consequences. According to the Law, wind farms can be assigned to CC1 consequences category, provided there is a positive expert opinion of the relevant authority in charge of environmental impact assessment. The threshold reduced to CC1 category of consequences provides for:

- exemption from project assessment (the Law places restrictions on assessment of a wind farm project for which an Environmental Impact Assessment is provided, only by its compliance with the results of an Environmental Impact Assessment);
- there are simpler authorization procedures and submission of a notification on the launch of construction works (prior to the commencement of construction works) and a declaration of facility readiness for operation (upon completion of construction works);
- contractors without a relevant license are allowed to perform construction works.

Notwithstanding the above, construction facilities can still be classified as facilities with CC2 and CC3 consequences based on other requirements for categories of consequences established by the laws of Ukraine.

2. The Law of Ukraine dated November 23, 2018, No. 2628-VIII «On amendments to the Tax Code of Ukraine and certain other legislative acts of Ukraine on improving the administration and revision of rates of some taxes and duties», which, among other things, simplifies the construction of renewable energy facilities and provides tax incentives for importing renewable energy equipment to Ukraine.

It is allowed to place renewable energy facilities on lands of industry, transport, communications, energy and defense without changing their designation.

Certain imports into the customs territory of Ukraine will be temporarily (until December 31, 2022) exempt from value-added tax:

- electric vehicles;
- wind turbines;
- solar photovoltaic panels;
- inverters with over 7.5 kW capacity;
- transformers with 10 MW capacity.

3. In order to ensure conditions for implementation of a new electricity market model provided for by the Law of Ukraine "On electricity market", NEURC has approved a number of by-laws, in particular:

- Market Rules (NEURC Resolution dated March 14, 2018 No. 307)
- The Day-Ahead Market and Intra-day Market Rules (NEURC Resolution dated March 14, 2018 No. 308);
- The Retail Electricity Market Rules (NEURC Resolution dated March 14, 2018 No. 312);
- Transmission System Code (NEURC Resolution dated March 14, 2018 No. 309);
- Distribution System Code (NEURC Resolution dated March 14, 2018 No. 310);
- Code of commercial electricity metering (NEURC Resolution dated March 14, 2018 No. 311).

4. NEURC Resolution dated December 18, 2018 No. 1965 "On approval of the Methodology (procedure) for calculating the fee for connection to transmission system and distribution system", which establishes transparent and non-discriminatory conditions to calculate fees for the connection of customers' electric installations to electric grids. The Methodology establishes the procedure for calculating the fee for a

standard connection, the procedure for calculating the fee for a non-standard connection, and the procedure for calculating the fee for connecting electric installations intended for electricity generation.

5. On the basis of the Methodology, NEURC approved Resolution dated December 28, 2018 No. 2069 "On approval of payment rates for non-standard connection of capacity and payment rates for the linear part of connection for the year of 2019", establishing corresponding payment rates for capacity connection and for the linear part of connection for the year of 2019 for all distribution systems operators.

6. Pursuant to the Law of Ukraine dated April 13, 2017 No. 2019-VIII "On electricity market":

- starting from January 1, 2019 - the retail electricity market has been launched;
- starting from July 1, 2019 - the wholesale electricity market has been launched (market of bilateral agreements, "day-ahead" market and "intra-day" market, balancing market);
- starting from December 12, 2019 - the auxiliary services market has been launched.

7. Taking into account the global trends in promoting development of "green" energy in order to introduce a competitive and transparent auction mechanism instead of the outdated tool of "feed-in" tariffs, the Law of Ukraine dated April 25, 2019 No. 2712-VIII "On amendments to certain laws of Ukraine on ensuring competitive conditions for production of electricity from alternative energy sources" was adopted. The Law provides for the transition to the auction system for promoting renewable electricity generation starting from 2020.

The key provisions of the Law are:

–mandatory participation in the auction for solar power plants  $\geq 1$  MW and wind farms  $\geq 5$  MW starting from 2020;

–auction winners gain state support for the sale of "green" energy during 20 years (PPA);

–holding auctions twice a year (no later than April 1 and October 1);

–ensuring an opportunity to participate in auctions for all types of renewable energy generation.

Setting an annual quota for the distribution of alternative energy capacity. The scope of the annual quota that will be auctioned is approved by the Cabinet of Ministers of Ukraine.

In addition, in order to unlock the reserved capacities, attract real investors and prevent speculation with technical specifications (TS), the Law limits the period of validity (TS):

- for SPPs - up to 2 years;
- for wind farms, biomass CHPs, small HPPs - up to 3 years.

8. Resolution of the Cabinet of Ministers of Ukraine dated December 27, 2019 No. 1175 "On the implementation of competitive conditions for production of electricity from alternative energy sources" approves:

- the procedure defining the manner of preparing and holding an auction for the distribution of support quotas for stimulating electricity producers from alternative energy sources

- the procedure for selecting operators of electronic platforms to hold auctions for the distribution of support quotas

This resolution allows holding "green auctions" for the sale of energy produced from alternative sources at transparent auctions through "PROZZORO.SALES" platform, which will stimulate production of alternative energy and reduce the price of "clean" energy."

9. NEURC Resolution dated April 26, 2019 No. 641 "On approval of regulatory legal acts regulating activities of a guaranteed buyer and purchase of electricity at a "feed-in" tariff and at an auction price" approves:

- the procedure for purchase of electricity produced from alternative energy sources by the guaranteed buyer;

- the methodology for preparing the guaranteed buyer's estimate, which regulates relations regarding financing of the guaranteed buyer's activities.

- standard agreement for the purchase and sale of electricity at a "feed-in" tariff;

- standard service agreement to ensure an increase in the share of electricity production from alternative sources

***Regarding regulatory support to fulfillment of sustainability criteria for production of biomass for liquid and gaseous fuel set forth in the aforementioned Directive 2009/28/EC.***

Producers of biological feedstock used for biofuel production, which export the mentioned feedstock to the EU countries, undergo a certification procedure to confirm their compliance with sustainability criteria set forth in Directive 2009/28/EC. Certification schemes relevant for Ukraine and already approved (under approval) by the European Commission are applied.

At the same time, it is not compulsory to apply any certification schemes when selling biomass in the domestic market for further biofuel production, and it can be sold on a voluntary basis under the terms specified in concluded agreements.

In order to support fulfillment of sustainability criteria for biomass production, the Ministry of Agrarian Policy and Food posted “Guidelines regarding establishment of sustainability criteria for biomass production” on its web-site.

The State Agency on Energy Efficiency and Energy Saving jointly with deputies have elaborated the Draft Law of Ukraine “On amendments to certain legislative acts of Ukraine regarding mandatory use of liquid biofuel (biocomponents) by the transport sector” (registration No. 3356 dated April 17, 2020).

The main purpose of the draft law is to establish an efficient regulatory mechanism for development of a competitive bioethanol and biocomponents market in the Ukrainian transport sector.

The key provisions of the draft law are as follows:

- establishing a mandatory share of liquid biofuel (quotas) in the annual total volumes of gasoline sales:

- starting from July 1, 2021 - at least 5% by volume;
- starting from July 1, 2023 - at least 6% by volume;
- starting from July 1, 2025 - at least 7% by volume.

introduction of metering and control over biocomponents content in gasoline;

- establishing liability (fines) for non-compliance with quotas.  
- introducing standards as to compliance of biofuels with sustainability criteria starting from July 1, 2022.

In general, the adoption of the draft law will promote:

- ✓ attraction of investments in production of liquid biofuels;
- ✓ construction of new facilities for bioethanol production;
- ✓ enhancement of agricultural holdings and distilleries;
- ✓ creation of new jobs;
- ✓ increase of tax revenues to the budgets of various levels;
- ✓ reduction of greenhouse gas emissions in the transport sector.

**2.b. Please describe the measures taken to ensure the transmission and distribution of electricity produced from renewable energy sources, and to improve the framework and rules for bearing and sharing of costs related to connection to the grid and grid strengthening. (Article 22(1)f of Directive 2009/28/EC)**

Pursuant to Article 21 of the Law of Ukraine “On electricity market”:

The transmission system operator and distribution system operators shall not be entitled to refuse the connection of electric installations of a customer to the transmission or distribution systems subject to compliance with the requirements of the transmission system code and distribution system code by a customer.

Connection of customer's electric installations to the transmission and distribution systems shall be a fee-based service and shall be provided by a transmission system operator or distribution system operator pursuant to the connection agreement.

Calculation of the tariff for a standard connection to grids of a distribution system operator shall comprise a component of fee for capacity connection (taking into account the power generated), which is defined as the product of the value ordered prior to capacity connection and the payment rate for standard connection.

Calculation of the tariff for a standard connection to grids of a distribution system operator shall comprise:

- a component of fee for capacity connection (taking into account the power generated), which is defined as the product of the value ordered prior to capacity connection and the payment rate for non-standard connection;

- a component of fee for establishment of electric grids of the linear part of connection.

Funds received by a transmission system operator, distribution system operators as a connection fee for establishing (constructing) electric grids of the linear part of connection shall be reimbursed to a customer upon the condition that a transmission system operator, distribution system operator refer such assets to a regulatory assets database upon engagement of a respective transmission system operator, distribution system operator in stimulating regulation.

Reimbursement of funds attracted as connection fee for establishment (construction) of electric grids of the linear part of connection by a transmission system operator, distribution system operators shall be done pursuant to the procedure set forth by the Regulator.

### **3. Please describe the support schemes and other available activities to promote use of energy from renewable sources, and indicate any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan. (Article 22(1)b of Directive 2009/28/EC)**

The main tools for promoting renewable energy growth in Ukraine are:

- setting a "feed-in" tariff for electric energy produced from alternative sources;
- auction system for support of energy produced from renewable sources;
- setting a stimulating tariff for thermal energy produced from alternative sources.

#### *1. Regarding the "feed-in" tariff mechanism.*

The Law of Ukraine "On alternative sources of energy" envisages setting a "feed-in" tariff for stimulating electricity generation from alternative sources of energy (with the exception of blast furnace and coke gas, and using hydropower generated only by micro, mini and small hydropower plants).

The "feed-in" tariff shall be fixed before January 1, 2030 for electricity produced from renewable sources:

1. for industrial power plants (under a license);
  - for solar power plants (SPPs) with a capacity of up to 1 MW;
  - for wind farms (WPPs) with a capacity of up to 5 MW;
  - for biomass/biogas power plants (regardless of capacity)
  - for small hydropower plants (with a capacity of up to 10 MW)
  - for geothermal power plants (regardless of capacity).
2. for electricity consumers, including energy cooperatives (minus their own consumption), it is allowed to install power plants with a capacity of up to 150 kW (wind farms, rooftop solar power plants, combined solar power plants and wind farms, biomass, biogas, small hydropower plants, geothermal station) (without a license);
3. for private households (without a license):
  - for SPPs – up to 30 kW;
  - for wind farms - up to 50 kW;
  - for combined solar power plants and wind farms - up to 50 kW

The facilities commissioned since 2020 will benefit from a "feed-in" tariff until 2030.

For industrial power plants commissioned before 2024, a "feed-in" tariff premium of 5% and 10% for the use of equipment manufactured in Ukraine is set at the level of 30% and 50%, respectively.

**"Feed-in" tariff rates**

Type of power plant	Power plant capacity and other factors impacting the "feed-in" tariff rate	Tariffs for commissioned facilities, €/kW·h		
		from 01.01.2017 until 31.12.2019	from 01.01.2020 until 31.12.2024	from 01.01.2025 until 31.12.2029
Wind farms	600kW or less	5,82	5,17	4,52*
	More than 600kW but less than 2 MW	6,79	6,03	5,28*
	2 MW or more	10,18	9,05	7,92*
Solar power plants	Ground-based power plants	15,02	13,52	12,01*
	Power plants on rooftops and/or facades of houses, buildings and constructions	16,37	14,75	13,09*
Biopower plants	Biomass is non-fossil biologically renewable substance of organic origin, in a form of products, waste and residues. Biogas is gas from biomass.	12,39	11,15	9,91*
Geothermal power plants	Geothermal energy	15,02	13,52	12,01*
Hydropower plants	Micro HPPs (rated for 200 kW inclusive)	17,45	15,72	13,95*
	Mini HPPs (rated for more than 200kW but less than 1 MW)	13,94	12,55	11,15*
	Small HPPs (rated for 10 MW inclusive)	10,45	9,42	8,35*
Private households power plants	Solar power plants rated for 30 kW or less	18,09	16,26	14,49*
	Winds farms rated for 30 kW or less	11,63	10,45	9,32*

*The "feed-in" tariff is pegged to EUR exchange rate and fixed in a national currency*

*\*- tariff is fixed as of the beginning of 2025 without quarterly calculations of conversions into EUR.*

**2. Regarding the auction system.**

On April 25, 2019 the Parliament adopted the Law of Ukraine No. 2712-VIII "On amendments to certain laws of Ukraine on ensuring competitive conditions for production of electricity from alternative energy sources", which provides for the transition to the auction system for promoting renewable electricity generation starting from 2020.

The key provisions of the Law are:

- mandatory participation in the auction for solar power plants  $\geq 1$  MW and wind farms  $\geq 5$  MW starting from 2020;
- auction winners gain state support for the sale of "green" energy during 20 years (PPA);
- ensuring an opportunity to participate in auctions for all types of renewable energy generation.

– a possibility to receive a premium of up to 10% to the auction price for use of equipment manufactured in Ukraine;

Basic requirements for bidders:

- confirmation of the right to own \ use a land plot;
- a signed agreement on the facility's connection to the grid.
- a bank guarantee as a security for the fulfillment of obligations for the construction

of a facility, amount to:

(EUR 15, 000 per 1 MW of facility capacity (EUR 5,000/1 MW - for participation in an auction, and EUR 10,000/1 MW for auction winners))

In addition, in order to unlock the reserved capacities, attract real investors and prevent speculation with technical specifications (TS), the Law limits the period of validity (TS):

- for SPPs - up to 2 years;
- for wind farms, biomass CHPs, small HPPs - up to 3 years.

### 3. Regarding setting a stimulating tariff for thermal energy

Aimed at stimulating heat generation from renewable sources of energy, the Verkhovna Rada of Ukraine adopted the Law of Ukraine dated March 21, 2017 No.1959-VIII “On amendments to the Law of Ukraine “On heat supply” regarding stimulating thermal energy production from alternative sources of energy”, which introduces the simplified and transparent procedure of setting a stimulating tariff for thermal energy from alternative sources. The tariff for thermal energy from alternative sources is fixed at the level of 90% of the acting tariff for thermal energy from gas (in case of its absence – at the level of average weighted tariff for thermal energy produced from natural gas in the context of regions).

Average weighted tariffs can be found here: <http://sae.gov.ua/uk/content/serednozvazheni-taryfy>

**Table 3. Renewable Energy Support Systems in 2017**

Year of applying renewable energy support systems (2017)		Energy production output, ktoe	Support amount per unit, €/toe	Total support amount (€ths)*
<b>1. Total annual estimated amount of support in energy generation sector:</b>		<b>508,3</b>	<b>1 195</b>	<b>607 664</b>
<i>a. Energy generated from solar radiation</i>				
Tools	Industrial solar power plants (Difference between the "feed-in" tariff and wholesale market price)	252,2	1 570	396 019
	Solar station household - by "feed-in" tariff	26,1	1 464	38 210
<i>b. Energy generated from wind</i>				
Tools	Industrial wind power plants (Difference between the "feed-in" tariff and wholesale market price)	173,9	703,5	122 333
<i>c. Energy generated from biomass</i>				
Tools	Industrial biomass power plants (Difference between the "feed-in" tariff and wholesale market price)	14,0	921,6	12 902
<i>c. Energy generated from biogas</i>				
Tool	Industrial biogas power plants (Difference between the "feed-in" tariff and wholesale market price)	21,3	899,2	19 154
<i>d. Energy generated by small hydropower plants</i>		20,8	915,8	19 049

Tool	Industrial small hydropower plants (Difference between the "feed-in" tariff and wholesale market price)			
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\*The exchange average rate for 2019 was used for the calculations: EUR 100 = UAH 2895,18.

**3.1. Please provide information on how supported electricity is allocated to final customers for purposes of Article 3(6) of Directive 2003/54/EC. (Article 22(1)b of Directive 2009/28/EC)**

**4. Please provide information on the structure of the support schemes to take into account renewable energy applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic materials and lignocellulosic materials. (Article 22(1)c of Directive 2009/28/EC)**

Article 22(1)c of Directive 2009/28/EC states that support schemes for renewable energy applications that give additional benefits shall be provided if needed.

Currently, no such support schemes are being developed in Ukraine.

**5. Please provide information on the functioning of the system of guarantees of origin for electricity generation and heating and cooling systems with the use of renewable energy sources and the measures taken to ensure the reliability and protection against fraud of the system. (Article 22(1)d of Directive 2009/28/EC)**

Resolution of the Cabinet of Ministers of Ukraine dated July 24, 2013 No. 771 approved the Procedure of issuance, use, and termination of the guarantees of origin for electricity for economic entities generating electricity from alternative sources of energy.

At present, the State Agency on Energy Efficiency and Energy Saving is authorized to issue the guarantees of origin. However, it is lacking the technological capacity and funds for implementing an electronic register for keeping record of data on issuance, use, and termination of guarantees, and has no control and supervisory powers for conducting relevant checks.

The party responsible for performance of these functions will be appointed upon launch of electricity market (pursuant to the Law of Ukraine "On electricity market").

**6. Please describe the developments in the preceding two years with regard to availability and use of biomass resources for energy purposes (Article 22(1)g of Directive 2009/28/EC)**

*Tables 4 and 4a are offered to provide more detailed information as to biomass stock.*





Biomass from household waste, **	-	-	-	-	-	-	-	-	-	-	-	-
Animal and plant waste	-	-	-	-	-	-	-	-	-	-	-	-
<i>Supply of biomass for transport:</i>												
General hoed crops for biofuel (specify main species)	-	-	-	-	-	-	-	-	-	-	-	-
a) sugar beet (in production of sugar and bioethanol from molasses), thousand tons	2539,2	-	-	-	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short-cycle trees for biofuel (specify main species)	-	-	-	-	-	-	-	-	-	-	-	-
Other (specify)	-	-	-	-	-	-	-	-	-	-	-	-

\* The amount of raw materials to be specified, if possible, **in cubic meters for biomass from forestry** and in **tons for biomass from agricultural and fisheries, and biomass from waste.**

\*\* Designation of this biomass category should be understood according to Table 7 of Part 4.6.1. of Commission Decision C (2009) 5174 final on approving the template for National Renewable Energy Action Plans pursuant to Directive 2009/28/EC.

**Table 4a. Current status of use of country's agricultural lands for cultivation of energy crops (ha)**

Land use	Area (ha)	
	2018	2019
1. Land used for general crops (wheat, sugar beet, etc.) and oil crops (rape, sunflower, etc.). (Specify main species)		
<i>Sugar beet (*) for production of biofuel (Molasses - a byproduct in sugar beet processing, used for the production of bioethanol)</i>	The total areas under sugar beet cultivation – 313,6 thousand hectares, of which for bioethanol production – 53,4 thousand hectares	The total areas under sugar beet cultivation – 221,9 thousand hectares,
<i>Sunflower seeds (*) for energy generation (sunflower seed husks are used for generation of thermal energy for the needs of vegetable oil extraction enterprises in agribusiness)</i>	The total areas under sunflower cultivation 6061 thousand hectares	The total areas under sunflower cultivation 5958,9 thousand hectares
<i>Wheat (*) for energy generation (straw is used for the production of solid biofuels for generation of thermal energy)</i>	For production of solid biofuel 33,0 thousand hectares	For production of solid biofuel 21,0 thousand hectares
2. Land planted with short-cycle trees (willow, poplar). (Specify main species)		
<i>Willow (**)</i>	4200	4200
3. Land used for other energy crops, such as grasses (reed canary grass, switch grass, silver grass), sorghum. (Specify main species)	600	600
<i>Silver grass (**)</i>	520	520
<i>Sorghum (**)</i>		The total areas under sorghum cultivation - 46,9 thousand hectares

Note: (\*) Listed in Table 4 are only the cultivation areas of crops, which have actually been used for cultivation of sunflower, sugar beet, and wheat, and their volumes (and/or of their waste and byproducts) used for the production of biofuel, electric and thermal energy are specified in Table 3.

(\*\*) The extent of cultivation of bioenergy crops (willow and silver grass) is given based on operational data of research institutions of the National Academy of Sciences of Ukraine and the Ministry of Agrarian Policy, which have pilot plantations for growing planting material, and of individual companies – economic entities, which are growing the said crops for sale or production of solid biofuel. The data are operational and could be updated or adjusted if statistical reporting is introduced.

***Regarding production volumes of liquid types of biofuel and volumes of biomass use in agribusiness***

***Regarding bioethanol production***

During the years of 2010-2018, the production of bioethanol and bioethanol-based components was launched at 9 agro-industrial enterprises: Naumivka, Haisyn, Zarubyntsi and Ivashky distilleries, Luzhany and Khorostkiv business sites of SOE "Ukrspyr", Bar distillery, Chervone food factory,

Additional Liability Company "Uzyn sugar plant".

Since 2015, pursuant to the Law of Ukraine dated February 12, 2015 No. 191-VIII "On amendments to certain legislative acts of Ukraine on simplification of business conditions (deregulation)", the Law of Ukraine "On amendments to certain laws of Ukraine concerning the production and use of motor fuels containing biocomponents", which established the mandatory use of bioethanol in the production of gasoline, has become invalid.

In 2018, bioethanol production was ensured only by 2 state-owned distilleries, bioethanol output constituted 22, 6 thousand tons.

The total volume of sugar beet production in Ukraine in 2019 was 10284, 5 thousand tons. Using the technological scheme for the production of sugar from sugar beet and the production of bioethanol from molasses, which is a by-product of sugar production, the production of alcohol or bioethanol can be calculated to be sufficient for the production of 96 thousand tons of bioethanol. However, due to the lack of demand for bioethanol among producers of mixed petroleum products that used bioethanol as additives in the production of gasoline, bioethanol production has significantly decreased.

In particular, the SOE "Ukrspyr" reported that the production of bioethanol in 2019 was not carried out by state-owned distilleries.

The legislation does not define the mandatory use of bioethanol in the production of mixed motor gasoline, and the lack of incentives for its use did not allow creating a domestic bioethanol market and fully using the capacity of state-owned distilleries for its production.

### ***Regarding biodiesel production***

In 2018, areas under winter and spring rapeseed cultivation in all categories (the basic raw material for biodiesel production) were 1039, 3 thousand hectares and harvested rapeseed crops were 2750,6 million tons annually in Ukraine.

According to calculations: the oil content is 35%-48% of the seed weight, the estimated volume of biodiesel production from 1 ton of rapeseed is 0, 33-0, 38 tons of biodiesel.

The total volume of rapeseed production in Ukraine in 2019 was 3,280 thousand tons, which is estimated to be enough to produce more than 1,093 thousand tons of biodiesel (rapeseed oil methyl esters).

Most of rapeseed is exported, because domestic enterprises are not able to produce biodiesel from rapeseed due to lack of tax incentives.

During the last years, production of biodiesel in Ukraine was terminated, which resulted from introduction of excise on the said types of fuel at almost equal level as the excise tax for diesel fuel from petroleum raw materials. For example, excise on biodiesel was fixed at the level of EUR 106 per 1000 litres, on diesel from petroleum - EUR 139, 5 per 1000 litres.

It should also be mentioned that pursuant to the Law of Ukraine No. 2628 "On amendments to the Tax Code of Ukraine and certain other legislative acts of Ukraine on improving the administration and revision of rates of some taxes and duties", new mechanisms for administering production and storage of fuel, including biodiesel, have been introduced.

Consequently, there are currently no incentives not only for producers, but also for consumers of biodiesel.

The Draft Law of Ukraine "On amendments to certain legislative acts of Ukraine regarding mandatory use of liquid biofuel (biocomponents) by the transport sector" (registration No. 3356 dated April 17, 2020) was submitted to the Verkhovna Rada of Ukraine, the adoption of which will regulate the issue of stimulating the use of bioethanol and biodiesel.

### ***Regarding biogas use.***

In agribusiness, there are 10 operating biogas plants that process wastes from livestock, crop production and sugar industry. Most of these biogas plants operate periodically and not at full capacity.

The largest operating complex of biogas plants in Ukraine is a facility constructed by the Danish company "Danosha" on the basis of a pig farm in Ivano-Frankivsk region.

Currently, the introduction of biogas technologies is provided mainly by powerful agricultural companies of the agro-industrial complex that have their own resources.

The production of biogas from livestock waste is more complex than from vegetable feedstock, but it provides both the disposal and disinfection of manure, the production of organic fertilizers for the development of organic farming.

### ***Regarding solid biofuels***

More than 300 enterprises store and/or produce solid biofuels (including briquettes, pellets and other fuels) from forestry waste in the amount of up to 380 thousand tons annually.

Over the past 5 years, less and less pellets produced have been exported from Ukraine to the European Union, and are instead used on the territory of Ukraine. Thus, the share of domestic consumption of solid biofuels is constantly increasing and in 2018 amounted to more than 50%.

Most enterprises of the oilseed industry featured a transition from steam boilers to burning husks. About 650 thousand tons of husks are burned annually saving up to 360 million m<sup>3</sup> of natural gas. In the total structure of energy consumption of oilseed enterprises, the use of sunflower husks equals to 50%.

In recent years, the production of solid biofuels from straw has begun to expand. The production of straw pellets is mainly carried out by low-capacity enterprises, which are equipped with straw pelletizing lines (or straw together with husks or wood) with a capacity of 600-2000 tons per year.

Currently, significant logistics costs reduce the competitiveness of straw pellet production, but in future this type of production may become promising, given the significant amount of raw materials available (straw and other types of agricultural production).

For further development of bioenergy, it is planned to increase areas for growing energy crops (such as energy willow, silver grass, switch grass, sweet sorghum).

During the period 2012-2018, the total area of technical willow, silver grass plantations increased from 100 to 4,600 hectares.

## **7. Please provide information on changes in commodity prices and land use within your Contracting Party during the preceding two years, associated with the increased use of biomass and other forms of energy from renewable sources. If available, provide references to the relevant documentation on this impact in your country. (Article 22(1)h of Directive 2009/28/EC)**

*When evaluating the impact on commodity prices, include at least the following commodities: general food and fodder crops, energy wood, pellets.*

### **According to data provided by the State Forest Resources Agency of Ukraine**

In 2019, enterprises that used or owned forests in Ukraine harvested 20,9 mln cu m of timber from all types of logging.

Volume of merchantable wood harvested in Ukraine is 17,9 mln cu m, including 15,5 mln cu m in the forests of the State Forest Resources Agency.

Within the scope of final felling, 7,9 mln cu m of merchantable wood were harvested (at the State Forest Resources Agency – 7,8 mln cu m).

Within the scope of final felling, forest management scope did not exceed the calculated felling rate which, as of the year of 2019, constituted 10,0 mln cu m (at the State Forest Resources Agency - 8,4 mln cu m).

Annual volume of timber which may be used for energy purposes in the forests of the State Forest Resources Agency equals to 6,2 mln cu m, including:

- non-merchantable wood - 1,7 mln cu m;
- fuel wood - 3,5 mln cu m;
- wood processing residues - 1,0 mln cu m;

Given the growth of heat and power facilities towards the increased use of biomass, the free resource of energy wood is reducing.

The free resource of energy wood proposed by enterprises of the State Forest Resources Agency in the domestic market and can be included to the energy balance of Ukraine constitutes about 1,6 mln cu m, including:

- non-merchantable wood (forest harvest residues) - 1,5 mln cu m;
- fuel wood (transitional residues) - 0,5 mln cu m;

In view of the above, principles of sustained management and expanded forest reproduction are applied to forestry, while the increased use of biomass does not lead to changes in land use.

**8. Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic materials and lignocellulosic materials. (Article 22(1)i of Directive 2009/28/EC)**

**Table 5 Biofuel production and consumption under Article 21(2) (ktoe)**

Biofuel under Article 21(2) <sup>6</sup>	2014	2015
Production – type X fuel (specify)		
Consumption – type X fuel (specify)		
Total production output of biofuel under Article 21.2		
Total consumption of biofuel under Article 21.2		
Share of fuel under Article 21.2 in the total RES volume in transport sector, %		

**9. Please provide information on the estimated impact of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality in your country in the preceding two years.** Please provide information on how this impact was evaluated, giving references to relevant documents on this impact in your country. (Article 22(1)j of Directive 2009/28/EC)

In 2019, the overall scope of activities and works dedicated to forest reproduction in Ukraine was conducted on an area of 48,8 thousand hectares.

Forestry enterprises belonging to the sphere of the State Forest Resources Agency management ensure compliance with the principles of sustainable forest management and expanded forest reproduction, which in their turn aim to protect biodiversity and natural biogeocenosis.

The National Forest Resources Agency's enterprises rehabilitated forests on an area of 42,0 thousand hectares, including 27,6 thousand hectares of forest crops and natural regeneration over an area of 14,4 thousand hectares. 2,2 thousand hectares of new forests have been planted.

In order to ensure highly productive plantations in the forest nurseries of forest enterprises, 252,9 million pieces of standard planting material have been grown.

The area of forests created in 2019 is 1.05 times greater than that of the clear cutting in 2018.

The sustainable growing of raw materials and biomass production meet the stability criteria for biofuels.

**According to data provided by the Ministry of Agrarian Policy and Food**

Article 17 of the Directive 2009/28/EC of the European Parliament and of the Council of April 23, 2009 on the promotion of the use of energy from renewable sources (hereinafter referred to as "Directive 2009/28/EC") defines basic sustainability criteria for biomass used for production of biofuel liquids for transport, or generation of thermal and electric energy, envisaging protection of areas with high biodiversity value and lands with high carbon stock (e.g., peatlands, grasslands, wetlands).

In Ukraine, the acting legislation provides for the protection of areas with high biodiversity value and lands with high carbon stock (e.g., peatlands, grasslands, wetlands).

In particular, the Land Code of Ukraine, the Laws of Ukraine "On Land Protection", "On Environmental Protection", "On the Nature Reserve Fund of Ukraine", "On Flora", "On Fauna", and the Water Code of Ukraine, prohibit the misuse of land with high biodiversity value, peatlands, grasslands, wetlands.

In accordance with Article 23 of the Land Code, lands used for cultivation of agricultural products (including raw materials for production of biofuels) are used for agricultural purposes and are determined based on data from the state land cadastre. At the same time, the owners or users use agricultural land plots exclusively within requirements to the land use of a certain type of use established by Articles 31,

<sup>6</sup> Biofuel made from wastes, residues, non-food cellulosic materials and lingocellulosic materials.

33-37 of the Code.

Thus, the main requirements of Directive 2009/28/EC regarding fulfillment of sustainability criteria are governed by the Ukrainian legislation.

**10. Please provide net reduction in greenhouse gas emissions due to the use of energy from renewable sources. (Article 22(1)k of Directive 2009/28/EC)**

*For calculating net reduction in greenhouse gas emissions due to the use of energy from renewable sources, the following methodology is proposed:*

- For biofuels: pursuant to Article 22(2) of Directive 2009/28/EC.
- For electricity and thermal energy, it is proposed to use the EU indicators of comparison of fossil fuels for electricity and thermal energy, as indicated in the report on requirements with regard to sustainable use of solid and gaseous sources of biomass in electric power generation, heating and cooling systems, if more recent evaluations are unavailable.

*If the Contracting Party decides against using the proposed methodology for evaluating the net reduction in greenhouse gas emissions, please describe any other methodology used for evaluating this reduction.*

**Table 6. Estimated greenhouse gas emission reduction due to use of energy from renewable sources (tons of CO2 equivalent)**

Environmental aspects	2016	2017
<b>Total estimated net greenhouse gas emission reduction due to use of energy from renewable sources</b>		
- Estimated net greenhouse gas emission reduction due to use of electricity from renewable sources of energy		
- Estimated net greenhouse gas emission reduction due to use of energy from renewable sources in heating and cooling systems		
- Estimated net greenhouse gas emission reduction due to use of energy from renewable sources in the transport sector		

**11. Please specify (for the preceding two years) and estimate (for subsequent years until 2020) any excess/deficit production of energy from renewable sources compared to the indicative trajectory, which could be transferred to other Contracting Parties and (or) to third parties or imported from other Contracting Parties and (or) third parties, as well as the estimated potential for joint projects, until 2020 (Article 22(1)l, m of Directive 2009/28/EC)**

**Table 7. The actual and estimated excess and (or) deficit (-) in the production of energy from renewable sources compared to the indicative trajectory, which could be transferred to other Contracting Parties, Member States, and (or) Third Parties, or imported from other Contracting Parties, Member States, and (or) Third Parties in [Contracting Party] (ktoe)**

	2014	2015	2016	2017	2018	2019	2020
The actual/estimated excess or deficit production (with break-down by type of energy from renewable sources and by origin/import/export purpose)	0						

**11.1. Please provide the data on statistical transfers, joint projects, and decision-making rules with regard to joint support system.** If the Contracting Party decides to implement Article 8 and (or) Article 9 of the Resolution of the Council of Ministers, it should inform about the measures taken for the conduct of an independent external audit pursuant to Article 13 of the Resolution of the Council of Ministers.

The National Renewable Energy Action Plan until 2020 makes no provisions for statistical transfers of energy from renewable sources.

**12. Please provide information on how the share of biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates. (Article 22(1)n of Directive 2009/28/EC)**

*Let us note that in the first progress report (for 2014) the Contracting Parties are requested to outline their intentions with regard to the questions presented in Article 22(3a-c). Also, we ask the Contracting Parties to provide any other information regarded as relevant for the specific situation of renewable energy development in each of the Contracting Parties.*

The basic document providing classification of wastes in Ukraine is the State Waste Classifier ДК 005-96, approved by the order of the State Committee of Ukraine for Standardization, Metrology and Certification dated February 29, 1996 No. 89. The given document defines wastes as any substances, materials and objects formed as a result of human activity and of no further use at the place of their formation or detection, where their owner disposes, intends or has to dispose them through disposal or removal.

Also, the Decree of the Ministry of Housing and Communal Services dated February 16, 2010 No. 39 approved the Methodological Guidelines for the Determination of the Morphological Composition of Solid Household Waste, aimed at introducing common approaches for research on the number of individual elements used in the composition of solid household waste with the purpose of further implementation within the communities of modern efficient technologies for the treatment of solid household waste and the long-term forecast of the volume of secondary raw materials available in the composition of solid waste.

In Ukraine, household waste is disposed by a waste incinerator in Kyiv. Also, a waste incineration installation in Kharkiv region and two mobile waste incineration installations in Kharkiv are used.

According to Ukrainian statistics in 2019, 441,5 million tonnes of waste were formed (excluding the AR Crimea and part of the anti-terrorist operations area) and incinerated to generate 960,1 thousand tonnes of energy.

According to the categories of waste incinerated for energy purposes, biomass-related materials were present, which notably represent 757,8 thousand tonnes:

- waste paper and cardboard - 0,1 thousand tonnes;
- wood waste - 334,6 thousand tonnes;
- phytogenic waste – 423,1 thousand tonnes.

As a result, the share of biodegradable waste in the waste incinerated for energy purposes is 78,9%.

The conversion of energy units into tons of oil equivalent as presented in this report was conducted according to Table A3.4 Conversion Equivalents between Units of Energy from the Energy Statistics Manual developed by the Energy Statistics Department of the International Energy Agency with support from the Eurostat.