

Report on the Promotion and Use of Energy from Renewable Sources in Ukraine in 2019–2020

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

The share of energy from renewable sources in the final consumption in Ukraine in 2019–2020 was calculated in accordance with the SHARES programme developed by Eurostat.

Table 1. Sectoral (electricity generation, heating and cooling systems, and transport sector) 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 of Ukraine)

	2019	2020
RES in heating and cooling systems (%)	9,03	9,28
RES in electricity (%)	10,89	13,92
RES in transport sector (%)	3,07	2,47
Overall share of RES (%), including:	8,08	9,19
<i>Borrowings in 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 calculating the share of energy produced by heat pumps and renewable energy sources, approved by Order of the Ministry of Regional Development, Construction and Housing and Communal Services No. 52 of 12.03.2018, registered in the Ministry of Justice of Ukraine as of 03.04.2018 under 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 of Ukraine)

	2019	2020
(A) Gross final consumption of energy from renewable sources in heating and cooling systems	2851,9	2868,3
(B) Gross final consumption of electricity from renewable sources	1343,7	1684,8
(C) Gross final consumption of energy from renewable sources in the transport sector*	137,3	95
(D) Total gross consumption of energy from renewable sources	4332,9	4648,1
(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 generation) of each renewable energy technology of Ukraine to achieve the 2020 mandatory targets and indicative intermediate trajectory of achieving the share of energy from renewable sources in electricity generation
(according to the data from the Energy Balance developed by the State Statistics Service of Ukraine)

	2019		2020	
	MW	GWh		
Hydropower plants ¹ :	6 354	7 854,8	6362	7559
non-storage (²):	4844	6 508 (10865,3)	4847	6 002 (10 371,7)
<i>with a capacity of less than 1 MW</i>	50	110	52	90
<i>with a capacity of 1-10 MW</i>	64	132	65	119
<i>with a capacity of more than 10 MW</i>	4 730	6 266	4730	5 793
storage	1 510	1346,8	1515	1 557
mixed ³				
Geothermal power plants				
Solar power plants:	5478	2932,8	6873	5 969,4
<i>photovoltaic</i>	5478	2932,8	6873	5 969,4
<i>concentrated solar power plants</i>				
<i>Tidal, wave, ocean power plants</i>				
Wind power plants (⁴):	1170	2 020,2 (1994,3)	1314	3270,6 (3007,3)
<i>onshore</i>	1170	2 020,2(1994,3)	1314	3270,6 (3007,3)
<i>offshore</i>				
Biomass:	181	406,9	212	755,4
<i>solid</i>	95	194,9	109	284
<i>biogas</i>	86	212,0	103	471,4
<i>bioliquids</i>				
TOTAL (including normalization)	13 183	13 214,7 (17 546,1)	14 761	17 554,4 (21 924,1)
<i>Without pumped hydroelectric energy storage (PHES) (including normalization)</i>	11 673	11 867,9 (16 199,3)	13 246	15 997,4 (20 103,8)
<i>of which combined heat and power (CHP)</i>				

not including renewable energy installations located in the occupied territory of the Autonomous Republic of Crimea, the total capacity of which is 494.87 MW, of which: solar power plants — 407.09 MW, wind power plants — 87.768 MW.

¹ Normalized according to Directive 2009/28/EC and Eurostat methodology.

² Normalized according to Directive 2009/28/EC and Eurostat methodology.

³ According to the new Eurostat methodology.

⁴ Normalized according to Directive 2009/28/EC and Eurostat methodology.

Table 1c. Overall actual share (final energy consumption⁵) of each renewable energy technology of Ukraine to achieve the 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 of Ukraine)

	2019	2020
Geothermal energy (other than heat pumps)	-	
Solar energy	0,6	0,6
Biomass:	2783,3	2816,1
<i>solid</i>	2762,6	2796,7
<i>biogas</i>	20,7	19,4
<i>bioliquids</i>		
Renewable energy from heat pumps, including:	68,0	51,7
- aerothermal		
- geothermal	37,9	36,2
- hydrothermal	18,8	9,7
	11,3	5,8
TOTAL	2851,9	2868,3
<i>of which in centralized systems</i>		
<i>biomass in private households</i>	1857,1	1891,6

Table 1d. Overall actual share of each renewable energy technology in [Contracting Party] to achieve the 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 of Ukraine)

	2019	2020
Bioethanol/ethyl tertiary butyl ether produced from bioethanol	88,1	51,1
<i>including biofuels under Art. 21.2</i>		
<i>including imported</i>		
Biodiesel		
<i>including biofuels under Art. 21.2</i>		
<i>including imported</i>		
Hydrogen from renewable sources		
Electricity from renewable sources (with 2.5 coefficient)	49,2 (109)	43,9 (97)
<i>including vehicular transport</i>		
<i>Energy from renewable sources consumed by railway transport (with 2.5 coefficients)</i>	39,9 (99,7)	35,4 (88,5)
<i>Energy from renewable sources consumed by other types of transport</i>	9,3	8,5
<i>including non-vehicular transport</i>		
Other (biogas, vegetable oils, etc.) — specify		
<i>including biofuels under Art. 21.2</i>		
TOTAL (with 2.5 coefficient for energy from renewable sources consumed by railway transport)	137,3 (197.1)	95 (148)

⁵ Direct use and centralized systems according to Art. 5.4 of Directive 2009/28/EC.

2. Actions taken in 2019–2020 and (or) planned at the national level to promote the growth of energy generation from renewable sources, taking into account the indicative trajectory of achieving the national renewable energy targets set out in your National Renewable Energy Action Plan. (Art. 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	Introduced or planned	Action start and end
2019					
The Law of Ukraine No. 2019-VIII of 13.04.2017 “On Electricity Market”	regulatory	Introduction of an electricity market.	All electricity market players	introduced	Entered into force on 11.06.2017 Introduction of an electricity market from 01.07.2019
The Law of Ukraine No. 2712 of 25.04.2019 “On Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources”	regulatory	Providing state support to economic entities in the field of renewable energy exclusively through quota auctions, which will ensure the development of alternative energy in a more controlled and efficient way and reduce the financial burden on consumers, as well as the threat of violating the operational safety of the United Energy Systems of Ukraine (UESU) in the future	Producers of electricity from renewable sources	introduced	Entered into force on 22.05.2019
Resolution of the CMU No. 324 of 17.04.2019 “On the establishment of state-owned enterprises “Guaranteed Buyer” and “Market Operator”,	regulatory	State-owned enterprises “Guaranteed Buyer” and “Market Operator” were established. “Guaranteed Buyer” and “Market Operator” are the legal successors of the	Guaranteed buyer, Market operator, Electricity producers operating under the feed-in tariff,	introduced	Entered into force on 20.04.2019

		property, rights and obligations of the state-owned enterprise “Energorynok” in accordance with the distribution balance sheets.			
Resolutions of the CMU No. 454 of 22.05.2019 “On approval of the Charter of the state-owned enterprise “Guaranteed Buyer”” and No. 455 of 22.05.2019 “On approval of the Charter of the state-owned enterprise “Market Operator””	regulatory	Approval of the Charter of the SoE “Guaranteed Buyer”, which is established to ensure the purchase of all electricity produced at electricity generation facilities that use alternative energy sources. Approval of the Charter of the SoE “Market Operator” in order to ensure the functioning of the “day-ahead” and “intraday” electricity markets, organization of purchase and sale of electricity in such markets.	Guaranteed buyer, Market operator Electricity producers operating under the feed-in tariff,	introduced	Entered into force on 01.06.2019
Resolution of the CMU No. 1175 of 27.12.2019 “On introducing competitive conditions to stimulate electricity production from alternative energy sources”	regulatory	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 2. Approval of the Procedure for selection electronic platform operators for holding auctions for the distribution of support quotas.	Economic entities intending to generate and/or generating electricity from alternative energy sources	introduced	Entered into force on 31.01.2020
Resolution of the NEURC No. 641	regulatory	1. Approval of the Procedure	Producers of	introduced	Entered into

<p>of 26.04.2019 “On approval of legal and normative acts regulating activities of a guaranteed buyer and purchase of electricity at a feed-in tariff and at an auction price”</p>		<p>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 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 increase the share of electricity production from alternative sources.</p>	<p>electricity operating under the feed-in tariff, potential producers, auction winners, guaranteed buyer, suppliers of electricity performing a function of a universal service suppliers (hereinafter — USP), transmission system operators (hereinafter — TSO) and commercial metering administrators.</p>		<p>force on 01.07.2019</p>
<p>Resolution of the NEURC No. 1817 of 30.08.2019 “On approval of the procedure for establishing, revising and terminating 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>	<p>Regulatory</p>	<p>Improving the Procedure for establishing, revising and terminating the feed-in tariff for electricity for economic entities and private households</p>	<p>economic entities, electricity consumers, including energy cooperatives and private households whose electricity generating installations produce electricity from alternative energy sources</p>	<p>Introduced</p>	<p>Entered into force on 15.09.2019</p>
<p>Resolution of the NEURC No. 2529 of 26.11.2019 “On approval of</p>	<p>Regulatory</p>	<p>Applying a mechanism to stimulate electricity production</p>	<p>Economic entities that have received a</p>	<p>Introduced</p>	<p>Entered into force on</p>

amendments to the Resolution of the NEURC No. 2932 of 10.12.2015 “On approval of the Procedure for determining the level of use of Ukrainian-made equipment at power facilities, including the commissioned stages of construction of power plants (start-up complexes) that produce electricity from alternative energy sources (except blast furnace and coke oven gases, and using hydropower — only micro-, mini- and small hydropower plants) and setting an appropriate feed-in tariff premium		from RES in a form of a feed-in tariff premium for economic entities that have acquired the right to support in electricity production from alternative energy sources as a result of the auction for the distribution of support quotas, as well as bringing the current regulatory act in compliance with the current legislation and legal and normative acts approved by the NEURC.	license to pursue economic activities of electricity production from RES.		06.12.2019
Resolution of the NEURC No. 2802 of 13.12.2019 “On amendments to the Resolution of the NEURC No. 641 of 26 April 2019”	regulatory	Bringing in line with the requirements of the Law of Ukraine “On Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources” of 25.04.2019 No. 2712-VIII	Market players: producers, guaranteed buyer, transmission system operator.	introduced	Entered into force on 28.12.2019
Resolution of the NEURC No. 2803 of 13.12.2019 “On approval of a Standard contract for the purchase and sale of electricity between the guaranteed buyer and the economic entity that according to the results of the auction acquired the right to support”	Regulatory	Approval of a standard form of the contract, which will be concluded between the winner of the auction for distribution of support quotas and the guaranteed buyer	Economic entities intending to generate and/or generating electricity from alternative energy sources, guaranteed buyer	introduced	Entered into force on 28.12.2019
Resolution of the NEURC No. 2804 of 13.12.2019 “On approval of the Procedure for the sale and metering of electricity produced by	regulatory	Compliance with the Law of Ukraine No. 2712-VIII of 25.04.2019 “On Amendments to Certain Laws of Ukraine on	Market players: consumers, transmission system operator, guaranteed	introduced	Entered into force on 28.12.2019

consumers, as well as payments for it”		Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources” and determination of the order of purchase and sale by the guaranteed buyer of electricity from consumers who have a feed-in tariff, such electricity metering, as well as payments for it.	buyer.		
“Warm Loans” Government Programme State support for thermal modernization of residential buildings in Ukraine (Resolution of the Cabinet of Ministers of Ukraine No. 1056 of 17.10.2011 “On some issues of using funds in the field of energy efficiency and energy saving”, as amended, as well as the Resolution of the Cabinet of Ministers of Ukraine No. 243 of 01.03.2010 “On approval of the State target economic programme of energy efficiency and development of the sphere of production of energy carriers from renewable energy resources and alternative types of fuel for 2010-2020”)	financial	Encouraging the population to implement energy efficient measures	Manufacturers and suppliers of equipment that produce thermal energy from renewable energy sources, population, association of co-owners of multi-apartment buildings, housing cooperatives	introduced	Entered into force on 06.05.2015 Valid until 2020
International conference on the topic: “Auction support system for renewable energy sector in Ukraine”	awareness raising	Introduction of a new auction system in Ukraine to stimulate the development of renewable	Renewable energy market players, IRENA experts,	awareness raising	21.02.2019

		energy and its impact on the country's economy.	representatives of the European Commission, the Energy Community, the EBRD, the IFC and other international organizations		
Specialized exhibit dedicated to alternative energy sources "Biofuels" within the framework of the XXXI International Agro-Industrial Exhibition "AGRO-2019"	awareness raising	Enhancing awareness regarding modern technologies, machinery and equipment for biofuel production	- enterprises using renewable energy sources, - enterprises producing biological feedstock - academic institutions	awareness raising	04-07.06.2019
X International Renewable Energy Investment Forum	awareness raising	Formation of social consciousness in a society to the need for efficient use of fuel and energy resources and renewable energy sources.	Investors, end consumers, public authorities (production of energy from renewable sources and alternative fuels).	awareness raising	28.11.2019
2020					
The Law of Ukraine No. 466-IX of 16.01.2020 "On Amendments to the Tax Code of Ukraine on Improving Tax Administration, Eliminating Technical and Logical Inconsistencies in Tax Legislation"	financial	power equipment for solar and wind power plants is excluded from the list of goods whose import into the customs territory of Ukraine is exempt from the value added tax.	Economic entities intending to generate and/or generating electricity from alternative energy sources	introduced	Entered into force on 23.05.2020
Memorandum of Understanding on the Settlement of Problematic Issues in the Renewable Energy Sector in Ukraine	regulatory	Holding successful negotiations as a result of which compromise agreements have been reached between public authorities and investors in the renewable	Investors, public authorities	introduced	Entered into force on 10.06.2020

		energy sector, the key ones of which are: consent on the part of investors to voluntary reduction of feed-in tariffs, limitation of terms of commissioning of SPPs under feed-in tariff, strengthening of responsibility for imbalances; ensuring on the part of the state of stable current payments, repayment of accumulated debt, the invariability of legislation and further development of the RES industry on a competitive basis, including through auctions and the introduction of market models of RES in the electricity market.			
The Law of Ukraine No. 810-IX of 21.07.2020 “On Amendments to Certain Laws of Ukraine on Improving the Conditions for Supporting the Electricity Production from Alternative Energy Sources”	regulatory	Implementation at the legislative level of the terms of the Memorandum of Understanding on the Settlement of Problematic Issues in the Renewable Energy Sector in Ukraine.	Producers of energy from alternative energy sources operating under the feed-in tariff, electricity consumers, guaranteed buyer, transmission system operator	introduced	Entered into force on 01.08.2020
Resolution of the Cabinet of Ministers of Ukraine No. 887 of 28.09.2020 “On amending the Procedure for conducting electronic auctions for the sale of electricity under bilateral agreements”	regulatory	Creating conditions for the sale by a guaranteed buyer of electricity produced from alternative energy sources, under bilateral agreements at electronic auctions directly to consumers.	Producers of energy from alternative energy sources operating under the feed-in tariff, guaranteed buyer, electricity consumers	introduced	Entered into force on 29.09.2020
Resolution of the NEURC No. 548 of 03.03.2020	regulatory	the procedure for issuing, renewing, suspending, revoking	All electricity	introduced	Entered into force on

<p>“On approval of the licensing terms for the types of economic activities, the state regulation of which is performed by the NEURC”</p>		<p>licenses and other issues related to the licensing of economic activities, the state regulation of which is carried out by the NEURC, is determined.</p>	<p>market players:</p>		<p>04.03.2020</p>
<p>Resolution of the NEURC No. 2084 of 11.11.2020 “On approval of Amendments to Market Rules”</p>	<p>regulatory</p>	<p>Defining the procedure for reimbursement by transmission system operators of the electricity unreleased by the producers who sell at the feed-in tariff or at the auction price in case of execution of the dispatcher's command to reduce the load in accordance with the requirements of the Law of Ukraine “On the Electricity Market”.</p>	<p>Electricity market players: producers operating under the feed-in tariff or auction price; transmission system operators; guaranteed buyer.</p>	<p>introduced</p>	<p>Entered into force on 18.11.2020</p>
<p>Resolutions of the NEURC on approval of the cost of the service on ensuring an increase in the share of electricity production from alternative energy sources provided by the guaranteed buyer (hereinafter — GB Service) No. 715 of 20.03.2020, No. 902 of 29.04.2020, No. 995 of 27.05.2020, No. 1211 of 24.06.2020, No. 1435 of 22.07.2020, No. 1600 of 19.08.2020, No. 1740 of 23.09.2020, No. 1937 of 21.10.2020, No. 2138 of 20.11.2020, No. 2682 of 23.12.2020. Resolutions of the NEURC on adjusting the cost of the GB Service</p>	<p>financial</p>	<p>Approving and adjusting the cost of the GB Service in accordance with the Procedure for the purchase by the guaranteed buyer of electricity produced from alternative energy sources, approved by the Resolution of the NEURC No. 641 of 26.04.2019</p>	<p>Electricity market players: guaranteed buyer, producers belonging to the balancing group of the guaranteed buyer, transmission system operator.</p>	<p>introduced</p>	<p>During the year</p>

<p>No. 1630 of 02.09.2020, No. 1879 of 13.10.2020, No. 2059 of 11.11.2020, No. 2414 of 09.12.2020.</p>					
<p>Resolutions of the NEURC on approval of the cost of the service to increase the share of electricity production from alternative energy sources provided by universal service providers (hereinafter — USP Service) No. 259 of 28.01.2020, No. 485 of 25.02.2020, No. 727 of 25.03.2020, No. 864 of 22.04.2020, No. 996 of 27.05.2020, No. 1210 of 24.06.2020, No. 1472 of 29.07.2020, No. 1612 of 26.08.2020, No. 1741 of 23.09.2020, No. 1939 of 21.10.2020, No. 2137 of 20.11.2020 and No. 2683 of 23.12.2020.</p> <p>Resolutions of the NEURC on adjusting the cost of the USP Service No. 260 of 28.01.2020, No. 363 of 07.02.2020, No. 514 of 28.02.2020, No. 751 of 01.04.2020, No. 904 of 29.04.2020, No. 1072 of 03.06.2020, No. 1431 of 15.07.2020, No. 1436 of 22.07.2020, No. 1738 of 16.09.2020, No. 1832 of 07.10.2020, No. 1953 of 30.10.2020, No. 2204 of 27.11.2020 and No. 2816 of 30.12.2020.</p>	<p>financial</p>	<p>Approving and adjusting the cost of the USP Service in accordance with the Procedure for the purchase by the guaranteed buyer of electricity produced from alternative energy sources, approved by the Resolution of the NEURC No. 641 of 26.04.2019</p>	<p>Electricity market players: universal service providers, private households (producers of electricity from alternative energy sources), transmission system operator</p>	<p>introduced</p>	<p>During the year</p>

Resolutions of the NEURC No. 158 of 14.01.2020 “On approval of Amendments to the Resolution of the NEURC No. 1817 of 30.08.2019 “On approval of the procedure for establishing, revising and terminating 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”	Regulatory	Improving in terms of clarification of the simplified procedure for establishing a feed-in tariff for electricity produced at electricity facilities operating under the feed-in tariff, in case of change of property rights to such electricity facilities and consideration at a meeting of the NEURC, which is held in the form of an open hearing, the issue of refusal to establish a feed-in tariff.	Economic entities that have received or intend to receive a license to pursue their economic activities of electricity production; electricity consumers, including energy cooperatives, private households whose electricity generating installations produce electricity from alternative energy sources	introduced	Entered into force on 21.01.2020
Resolution of the NEURC No. 1209 of 24.06.2020 on approval of Amendments to the Code of Distribution Systems	regulatory	Establishing the procedure for connecting generating units of private households	Retail electricity market players: distribution system operators; consumers.	introduced	Entered into force on 01.07.2020
Order of the MinEnergy No. 596 of 14.09.2020 “On approval of a Standard agreement on holding electronic auctions for distribution of support quotas between the auction procuring entity and the electronic platform operator” (registered in the Ministry of Justice of Ukraine as of 27.11.2020 under No. 1186/35469)	regulatory	Settlement of contractual relations between the auction procuring entity and the electronic trading platform operators, which will ensure the holding of auctions for distribution of support quotas in the electronic trading system.	Guaranteed buyer, electronic trading platform operators	introduced	Entered into force on 15.12.2020
The Law of Ukraine No. 1006-IX “On Amendments to the Law of	regulatory	Granting the right to the Cabinet of Ministers of Ukraine	Transmission system operator, guaranteed	introduced	Entered into force on

Ukraine "On State Budget of Ukraine for 2020"		to provide state guarantees for the fulfilment of debt obligations of the transmission system operator in order to repay the debt to the guaranteed buyer and, accordingly, producers operating under the feed-in tariff.	buyer, producers of electricity from alternative energy sources operating under the feed-in tariff		28.11.2020
Resolution of the Cabinet of Ministers of Ukraine No. 1203 of 09.12.2020 "On some issues of the implementation of the Law of Ukraine "On the State Budget of Ukraine for 2020"	regulatory	Creating and approving conditions for providing state guarantees in 2020 to ensure the fulfilment of debt obligations under credits (loans) taken out by PJSC NEC Ukrenergo from public sector banks in order to repay debts to the SoE "Guaranteed Buyer"	Transmission system operator, guaranteed buyer, producers of electricity from alternative energy sources operating under the feed-in tariff	introduced	Entered into force on 10.12.2020
"Warm Loans" Government Programme State support for thermal modernization of residential buildings in Ukraine (Resolution of the Cabinet of Ministers of Ukraine No. 1056 of 17.10.2011 "On some issues of using funds in the field of energy efficiency and energy saving", as amended, as well as the Resolution of the Cabinet of Ministers of Ukraine No. 243 of 01.03.2010 "On approval of the State target economic programme of energy efficiency and development of the sphere of production of energy carriers from renewable energy resources and alternative types of	financial	Encouraging the population to implement energy efficient measures	Manufacturers and suppliers of equipment that produce thermal energy from renewable energy sources, population, association of co-owners of multi-apartment buildings, housing cooperatives	introduced	Entered into force on 06.05.2015 Valid until 2020

fuel for 2010-2020”)					
Specialized exhibit dedicated to alternative energy sources “Biofuels” within the framework of the XXXII International Agro-Industrial Exhibition “AGRO-2020”	awareness raising	Enhancing awareness regarding modern technologies, machinery and equipment for biofuel production	<ul style="list-style-type: none"> - enterprises using renewable energy sources, - enterprises producing biological feedstock - academic institutions 	awareness raising	11–14.08.2020
All-Ukrainian online-forum "Energy-independent regions of Ukraine: how to substitute natural gas, find investments and stimulate business", organized by the State Agency on Energy Efficiency and Energy Saving of Ukraine	awareness raising	Improving the awareness of local governments and businesses about ways to reduce dependence on traditional energy resources and the transition to the use of renewable energy sources	<ul style="list-style-type: none"> - central executive bodies; - local authorities and local governments; - enterprises that use renewable energy sources, - enterprises that produce biological raw materials; - local communities; - experts; - scientific institutions; - mass media. 	awareness raising	24.11.2020
Discussion «Green transition. Realities of Ukraine», organized by the State Agency on Energy Efficiency and Energy Saving of Ukraine	awareness raising	Discussing effective ways to provide Ukrainian "green" course in view of the EU Green Deal introduction	<ul style="list-style-type: none"> - profile ministries; - profile associations; - international organizations; - experts. 	awareness raising	10.12.2020
Awareness-raising campaign under the EU Twinning Project on the benefits of renewable energy in households - "Clean Energy for	awareness raising	Informing the public about the benefits of implementing technologies using renewable	<ul style="list-style-type: none"> - local authorities and local governments; - regional TV 	awareness raising	July 2020 - July 2021

Your Family" initiated by the State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE) with the support of the EU Twinning Project		energy sources	channels.		
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* 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 behaviour, installed capacity (MW; t/year), generated energy (ktoe)?

*** Who are the target individuals: investors, end consumers, 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 oblast 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-governing bodies 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 2016–2017 the international technical assistance programmes 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 2019-2020 the following legal and normative acts were adopted to promote growth of renewable energy sphere and improve administrative procedures:

1. Given 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 No. 2712-VIII of 25.04.2019 “On Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources” was adopted. The Law provides for the transition to the auction system for promoting renewable electricity production starting from 2020.

The key provisions of the Law are:

- mandatory participation in the auction for SPPs ≥ 1 MW and WPPs ≥ 5 MW from 2020;
- auction winners gain state support for the sale of “green” energy for 20 years (PPA agreement);
- 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, investors and prevent speculation with technical specifications (TS), the Law limits the period of validity (TS):

- for SPPs — up to 2 years;
- for WPPs, biomass CHPs, small HPPs — up to 3 years.

2. Resolution of the CMU No. 1175 of 27.12.2019 “On ensuring competitive conditions for electricity production from alternative energy sources” approves:

- the procedure defining the manner of preparing and holding an auction for the distribution of support quotas to stimulate producers of electricity 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.”

3. Resolution of the NEURC No. 641 of 26.04.2019 “On approval of legal and normative 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.

4. The rapid growth of electricity production from alternative energy sources has created a number of economic and technical challenges related to both the high cost of generated “green” electricity and the limited capacity of the unified energy system of Ukraine to integrate such facilities.

Thus, this led to a significant increase in payments to electricity producers operating under the feed-in tariff and caused an increase in subsidies, which is realized through the imposition of special obligations on state-owned enterprises SoE “Guaranteed Buyer” and PJSC NEC Ukrenergo. The settlements of the SoE “Guaranteed Buyer” with the producers operating under the feed-in tariff in April-

July 2020 amounted to 3-5%, which led to the enterprise's debt in the amount of UAH 22.4 billion as of 01.08.2020.

In addition to financial challenges, there are technical risks associated with the complexity of ensuring the operational safety of the UES of Ukraine in terms of a significant share of RES. The UES of Ukraine lacks flexible (shunting) generating capacity, which is necessary to ensure the integration of renewable energy facilities, especially with a variable generation schedule, which leads to uneconomical modes of operation of the power system.

In order to resolve problematic issues in the industry, the Government and the MinEnergy have been holding public discussions since October 2019, involving a wide range of representatives of the concerned public authorities, their institutions, investors, relevant associations and financial institutions, experts and industry specialists. Also, at the initiative of investors, the Energy Community Secretariat Dispute Resolution and Negotiation Centre was involved in the discussions as a mediator of negotiations.

Through lengthy discussions and complex negotiations, the Government and the MinEnergy managed to reach compromise agreements with investors in the renewable energy sector, taking into account the interests of different producer groups, the state and consumers, which were set out in the Memorandum of Understanding on the settlement of problematic issues in the field of renewable energy in Ukraine (hereinafter — the Memorandum).

On 10.06.2020, the terms of the Memorandum were supported by the Government of Ukraine and on the same day it was signed by the Prime Minister of Ukraine, the Acting Minister of Energy of Ukraine, as well as the Chairman of the European-Ukrainian Energy Agency and the Ukrainian Wind Energy Association, who represent the interests of investors in the renewable energy sector and were the initiators and active participants in the mediation process.

Also, at the meeting of the National Energy and Utilities Regulatory Commission, which took place in the form of an open hearing, the Resolution No. 1141 of 17.06.2020 “On approval of the Memorandum of Understanding on the settlement of problematic issues in the field of renewable energy of Ukraine” was adopted, under which the Memorandum was signed by the Chairman of the NEURC.

At the same time, the MinEnergy received a letter dated 12.04.2021 from Mr. Dirk Buschle, the Chairman of Energy Community Secretariat Dispute Resolution and Negotiation Centre, with an attached Memorandum signed by the Chairman of Energy Community Secretariat Dispute Resolution and Negotiation Centre.

The Memorandum provides for voluntary consent of investors to:

- reduce feed-in tariff rates;
- reduce the terms of putting SPPs into operation within the framework of the feed-in tariff model;
- strengthen the responsibility for imbalances created by RES electricity producers;
- improve the auction support system.

The state provides for:

- ensuring stable current payment for electricity generated;
- repaying debt formed before 01.08.2020 in the amount of UAH 22.4 billion, according to the schedule agreed by the parties
- guaranteeing the invariability of legislation for producers operating under the feed-in tariff;
- implementing market models of functioning of electricity producers from alternative energy sources;
- ensuring further development of the industry on a competitive basis by holding auctions for the allocation of support quotas.

Ukraine did not unilaterally reduce feed-in tariffs, but reached a solution to this issue through lengthy negotiations with investors, finding compromises and concluding a Memorandum, which became the basis of the law.

5. On 21.07.2020, the Verkhovna Rada of Ukraine adopted the Law of Ukraine No. 810-IX “On Amendments to Certain Laws of Ukraine on Improving the Conditions for Supporting the Electricity Production from Alternative Energy Sources”, which was drafted by the MinEnergy and provides for the implementation of the agreements set out in the Memorandum.

The Law provides for:

1) reduction in the feed-in tariff rates from 01.08.2020 for facilities commissioned from 01.07.2015 to 31.12.2019 for SPPs rated for more than 1 MW by 15%, for SPPs rated for less than 1 MW by 7.5% and for WPPs by 7.5%;

2) reduction in the feed-in tariff rates from 01.08.2020 for SPPs and WPPs commissioned from 01.01.2020 by 2.5%;

3) setting from 01.08.2020 a maximum feed-in tariff rate for renewable energy facilities commissioned by 30.06.2015;

4) limiting the commissioning of SPPs operating under the feed-in tariff by reducing a feed-in tariff for SPPs with installed capacity of 1 to 75 MW from 01.11.2020 by 30% and from 01.04.2021 by 60%. For SPPs with installed capacity of 75 MW or more from 01.11.2020 by 60%. It should be noted that for WPPs the commissioning dates remained unchanged;

5) introducing from 2022 (50% in 2021) a full responsibility of RES producers with installed capacity of more than 1 MW for the imbalance of their actual and accepted (forecast) schedules of electricity production, which will create economic incentives for such entities to improve the accuracy of forecasting their schedules supply of electricity and will promote the development of the balancing capacity sector. Meanwhile, the size of an acceptable forecast error is 10% for WPPs and 5% for SPPs;

6) identifying the transmission system operator responsible for compensation of electricity not supplied by RES producers, as a result of their execution of dispatching commands to reduce and/or limit the load, in accordance with the methodology approved by the NEURC;

7) providing state guarantees the invariability of the legislation in force on the day of adoption of this Law for producers operating under the feed-in tariff;

8) improving the auction support model, which is designed to make it more transparent, flexible and adaptable. In particular:

- specifying the procedure for forming annual support quotas and determining the schedule of holding auctions;

- the possibility of holding auctions in certain oblasts (regions), which will make it possible to offer annual support quotas in energy-deficient oblasts and will promote the even distribution of renewable energy facilities throughout Ukraine;

- the possibility to determine the maximum capacity of renewable energy facilities in respect of which economic entities may acquire the right to support based on the results of the relevant auction. This will allow for auctions with limited capacity for RES facilities (e.g., up to 1 MW), which will promote the development of small distributed generation;

- introducing a mechanism for holding auctions for buildings (by analogy with the existing mechanism for holding auctions for land plots), which can be leased for the construction of solar power plants. This will allow to attract the almost untapped potential of roofs and facades of buildings, including in cities (condominiums, public and municipal institutions, etc.), which will help bring renewable generation closer to consumers;

- providing opportunities to participate in auctions for SPPs located on the roofs;

- determining the maximum sizes of price offers of auction participants in the context of technologies.

Regarding regulatory support to fulfilment 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.

Thanks to the effective cooperation of the State Agency on Energy Efficiency and Energy Saving, the Ministry of Energy of Ukraine, the MPs and the associations of oil refining and alcohol industries, the draft Law of Ukraine No. 3356-d of 05.11.2020 “On Amendments to Certain Legislative Acts of Ukraine regarding Mandatory Use of Liquid Biofuel (Biocomponents) in the Transport Sector” was developed and registered in the Parliament http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=70345.

On 30.06.2021, the Verkhovna Rada of Ukraine adopted in the first reading as a basis the draft Law

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. Its adoption is an important step towards replacing oil and oil products, which in 2020 took first place in the commodity structure of Ukraine's imports in the amount of USD 3.8 billion.

In addition, Ukraine annually imports up to 55 thousand tons of bioethanol in gasoline, of which 78% — from Belarus, 21% — from Lithuania and another 1% — from other countries. At the same time, the total production capacity of the SoE “Ukrspyr” reaches about 110 thousand tons of bioethanol per year, which are currently untapped.

The draft Law provides for:

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

➔ starting from 1 May 2022 — at least 5% by volume;

introduction of metering and control over biocomponents content in gasoline;

- establishing liability (fines) for non-compliance with quotas by economic entities engaged in the production, import and sale of gasoline in the customs territory of Ukraine;

- introducing requirements as to compliance of biofuels with sustainability criteria starting from 1 July 2022.

Meanwhile, the technical characteristics of fuels with biocomponents must meet the requirements of technical regulations, harmonized European standards and other legal and normative acts.

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 for the production of liquid biofuels;

✓ creation of new jobs;

✓ increase the level of workload of distilleries and production potential of related areas;

✓ 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 the 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 customers.

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 nonstandard 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 electricity 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" provides for 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 1 January 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 power plants (WPPs) with a capacity of up to 5 MW;
 - for biomass/biogas power plants (for facilities commissioned before 31.12.2022)
 - 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 (WPPs, rooftop SPPs, combined SPPs and WPPs, biomass, biogas, small HPPs, geothermal station) (for WPPs and SPPs without a license);
3. for private households (without a license):
 - for SPPs — up to 30 kW;

- for WPPs — up to 50 kW;
- for combined SPPs and WPPs — up to 50 kW

The facilities commissioned since 2020 will benefit from a feed-in tariff until 2030. *The feed-in tariff is pegged to EUR exchange rate and is fixed in a national currency*

For industrial power plants commissioned before 2024, a premium for the use of equipment manufactured in Ukraine is set and will apply till 2030.

A feed-in tariff premium

The level of a feed-in tariff premium	Compliance with the level of the use of Ukrainian equipment, %
5	30–50
10	50–70
20	70 and more

Feed-in tariff rates €ct/kW·h (excluding VAT) according to the Law No. 810

Type of power plant	Power plant capacity and other factors impacting the feed-in tariff rate	Tariffs for commissioned facilities				
		from 01.01.21 until 31.03.21	from 01.04.21 until 31.12.21	from 01.01.22 until 31.12.22	from 01.01.23 until 31.12.24	01.01.25 to 31.12.29
WPPs	600 kW or less	5.06		4.95	4.9	4.52
	More than 600 kW less than 2000 kW	5.92		5.82	5.71	5.28
	2000 kW or more	8.82				7.72
SPPs	Ground-based power plants rated for 1 MW or less	10.61		10.23	9.87	9.51
	Ground-based power plants rated for 1 to 75 MW	7.61	4.35	4.2	4.08	3.9
	Ground-based power plants rated for 75 MW or more	4.35		4.2	4.08	3.9
	Power plants on rooftops and/or façades of houses, buildings and constructions	11.85		11.47	11.04	10.66
Biopower plants	Biomass. Biogas is gas from biomass	12.39			---	
Geothermal power plants	Geothermal energy	13.52				12.01
HPPs	Micro hydroelectric power stations (rated for 200 kW or less	15.72				13.95

	Mini hydroelectric power stations (rated for more than 200 kW but less than 1000 kW)	12.55	11.15
	Small hydroelectric power stations (rated for 10000 kW or less)	9.42	8.35
Private households power plants	Solar power plants rated for 30 kW or less	16.26	14.49
	Wind power plants rated for 50 kW or less	10.45	9.32
	Combined solar power plants and wind power plants rated for 50 kW or less	12.28	10.66

Feed-in tariff rates €/kW·h for electricity generated by generating installations of consumers, including energy cooperatives, the installed capacity of which does not exceed 150 kW

Type of power plant	Power plant capacity and other factors impacting the feed-in tariff rate	Tariffs for commissioned facilities, €/kW·h	
		from 01.01.20 until 31.12.24	01.01.25 to 31.12.29
WPPs	up to 150 kW	10.45	9.32
SPPs	rated for 150 kW or less, on rooftops and/or façades of houses	12.28	10.66
Biomass and biogas	up to 150 kW	12.39	
Geothermal power plants	up to 150 kW	13.52	12.01
Combined solar power plants and wind power plants	up to 150 kW	12.28	10.66
Hydropower plants	up to 150 kW	15.72	13.95

2. Regarding the auction system.

On 25.04.2019, the Parliament adopted the Law of Ukraine No. 2712-VIII “On Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for Electricity Production from Alternative Energy Sources”, which provides for the transition to the auction system for promoting renewable electricity production.

At the same time, the Law of Ukraine No. 810-IX of 21.07.2020 “On Amendments to Certain Laws of Ukraine on Improving Conditions for Supporting Electricity Production from Alternative Energy Sources” made amendments in terms of improving the auction model of support.

The key provisions of the auction support system are:

- mandatory participation in the auction for SPPs ≥ 1 MW and WPPs ≥ 5 MW;
- auction winners gain state support for the sale of “green” energy for 20 years (PPA agreement) by concluding an appropriate agreement with a guaranteed buyer;
- holding auctions in the electronic trading system administered by the SoE “Prozorro.Sales”

- the Cabinet of Ministers of Ukraine sets the annual support quota and the schedule of auctions for the next year, as well as indicative forecast indicators of annual support quotas for 4 years following the next;
- holding auctions with separate technologies and, if necessary, technology-neutral auctions;
- holding auctions with defined land plots or rooftops and/or façades of buildings.

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 No. 1959-VIII of 21.03.2017 “On Amendments to the Law of Ukraine “On heat supply” regarding stimulating thermal energy production from alternative sources of energy”, which provides for 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 an average weighted tariff for thermal energy produced from natural gas in the context of regions).

The average weighted tariffs are available at: <http://sae.gov.ua/uk/content/serednozvazheni-taryfy>

Table 3. Renewable Energy Support Systems in 2020

Year of applying RES support systems (2020)		Energy production output, ktoe	Support amount per unit, €/toe	Total support amount (€ ths)*
1. Total annual estimated amount of support in electricity generation sector:		942.6	1015	957,160
<i>a. Electricity generated from solar radiation</i>				
Instruments	Difference between the feed-in tariff and the wholesale market price	513.4	1256	644,847
	Solar plant household — at feed-in tariff	65	984	63,951
<i>b. Electricity generated from wind</i>				
Instruments	Difference between the feed-in tariff and the wholesale market price	281.3	616	173,252
<i>c. Electricity generated from biomass</i>				
Instruments	Difference between the feed-in tariff and the wholesale market price	24.4	1003	24,479
<i>d. Electricity generated from biogas</i>				
Instrument	Difference between the feed-in tariff and the wholesale market price	40.5	853	34,557
<i>e. Electricity generated by small hydropower plants</i>				
Instrument	Difference between the feed-in tariff and the wholesale market price	18	893	16,073

The exchange average rate for 2020 was used for the calculations: EUR 1 = UAH 30.79

3.1. Please provide information on how supported electricity is allocated to end users 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 RES and the measures taken to ensure the reliability and protection of the system against fraud. (Article 22(1)d of Directive 2009/28/EC)

The Resolution of the Cabinet of Ministers of Ukraine No. 771 of 24.07.13 approved the Procedure on 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 entity responsible for performance of these functions will be appointed upon launch of the electricity market (pursuant to the Law of Ukraine “On the Electricity Market”).

6. Please describe the developments in the preceding 2 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.

Table 4. Biomass supply for energy purposes

	Amount of domestic raw materials (*)		Primary energy in domestic raw materials (ktoe)		Amount of raw materials imported from the EU (*)		Primary energy in the amount of raw materials imported from EU (ktoe)		Amount of raw materials imported from outside the EU (*)		Primary energy in the amount of raw materials imported from outside the EU (ktoe)	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Supply of biomass for heating and electricity generation:												
Direct supply of wood biomass from forests and other wooded areas for generation of energy (from logging, etc.)** thousand cubic metres	5,115.1	4,704.8	951.4	875.1	-	-	-	-	-	-	-	-
a) timber logging — firewood thousand cubic metres	3,463.0	3,093.8	644.1	575.4	-	-	-	-	-	-	-	-
b) forest product residues thousand cubic metres	1,652.1	1,611.0	307.3	299.6	-	-	-	-	-	-	-	-
Indirect supply of wood biomass (residues and byproducts of woodworking industry, etc.)** thousand cubic metres	955.9	903.6	177.8	168.1	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short-cycle trees (specify)	-	-	-	-	-	-	-	-	-	-	-	-
Byproducts of agriculture / processed residues and byproducts of fisheries**	-	-	-	-	-	-	-	-	-	-	-	-
a) Sunflower seed husks, thousand tons (for thermal energy)	1,250	1,280	328.5	336	-	-	-	-	-	-	-	-
b) Wheat straw,	30	12	7	3	-	-	-	-	-	-	-	-

thousand tons (for production of solid biofuel)												
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	-	-	-	-	-	-	-	-	-	-	-	-
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 metres 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 (thousand ha)

Land use	Area (thousand ha)	
	2019	2020
1. Land used for general crops (wheat, sugar beet, etc.) and oil crops (rape, sunflower, etc.). (Specify main species)	14,164.3	14,288.7
<i>Sugar beet (*) for production of biofuel (Molasses — a byproduct in sugar beet processing, used for the production of bioethanol)</i>	220.6	218.9
<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>	5,849.3	6,383.3
<i>Rapeseed</i>	1,285.4	1,115.2
<i>Wheat (*) for energy generation (straw is used for the production of solid biofuels for generation of thermal energy)</i>	6,809	6,571.3
2. Land planted with short-cycle trees (willow, poplar). (Specify main species)	4.2	5.88
<i>Willow</i>	4.2	5.88
3. Land used for other energy crops, such as grasses (reed canary grass, switch grass, silver grass), sorghum. (Specify main species)	136.82	201.02
<i>Silver grass</i>	0.52	0.52
<i>Panicgrass</i>	89.9	150.5
<i>Sorghum</i>	46.4	50

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.

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 the SoE “Ukrspyrnt”, Bar distillery, Chervone food factory, Uzyn sugar plant SLC

Since 2015, pursuant to the Law of Ukraine No. 191-VIII of 12 February 2015 “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 2020, areas under winter and spring rapeseed cultivation in all categories (the basic raw material for biodiesel production) were 1085.1 thousand ha and harvested rapeseed crops were 24920.4 thousand cwt 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 2020 was 2492 thousand tons, which is estimated to be enough to produce around 831 thousand tons of biodiesel (rapeseed oil methyl esters)

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

During the last years, production of biodiesel in Ukraine was terminated, which resulted from introduction of excise. The excise on biodiesel was fixed at the level of EUR 106 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-d of 05.11.2020) was submitted to the Verkhovna Rada of Ukraine, the adoption of which will regulate the issue of stimulating the use of liquid biofuel.

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 oblast.

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 2019 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 m³ 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 of 2012-2020, the total area of technical willow, silver grass plantations increased from 100 to 5880 ha.

7. Please provide information on changes in commodity prices and land use within your Contracting Party during the preceding 2 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 2020, enterprises that used or owned forests in Ukraine harvested 17.8 million cubic metres of timber from all types of logging.

Volume of merchantable wood harvested in Ukraine is 16.8 million cubic metres, including 15.2 million cubic metres in the forests of the State Forest Resources Agency.

Within the scope of final felling, 7.1 million cubic metres of merchantable wood were harvested (at the State Forest Resources Agency — 6.3 million cubic metres).

Within the scope of final felling, forest management scope did not exceed the calculated felling rate which, as of the year of 2020, constituted 10.0 million cubic metres (at the State Forest Resources Agency — 8.4 million cubic metres).

Annual volume of timber which may be used for energy purposes in the forests of the State Forest Resources Agency equals to 5.6 million cubic metres, including:

- non-merchantable wood — 1.6 million cubic metres;
- fuel wood — 3.1 million cubic metres;
- wood processing residues — 0.9 thousand cubic metres;

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 1.9 million cubic metres, including:

- non-merchantable wood (forest harvest residues) — 1.5 million cubic metres;
- fuel wood (transitional residues) — 0.4 million cubic metres;

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 Art. 21(2) (ktoe)

Biofuel under Art. 21(2) ⁶	2014	2015
Production — type X fuel (specify)		
Consumption — type X fuel (specify)		

⁶ Biofuels made from wastes, residues, non-food cellulosic materials and lignocellulosic materials.

Total production output of biofuel under Art. 21.2		
Total consumption of biofuel under Art. 21.2		
Share of fuel under Art. 21.2 in the total RES volume in the 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 2 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 2020, the overall scope of activities and works dedicated to forest reproduction in Ukraine was conducted on an area of 44,8 thousand ha.

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 39.3 thousand ha, including 26.7 thousand ha of forest crops and a natural regeneration over an area of 12.6 thousand ha. They have also planted 2.1 thousand ha of new forests.

In order to ensure highly productive plantations in the forest nurseries of forest enterprises, 231.9 million pieces of standard planting material have been grown.

The area of forests created in 2020 is 1.1 times greater than that of the clear cutting in 2019.

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 of Ukraine

Article 17 of 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 (hereinafter — 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).

The current Ukrainian 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, 33-37 of the Code.

Thus, the main requirements of Directive 2009/28/EC regarding fulfilment 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
Total estimated net greenhouse gas emission reduction due to use of energy from renewable sources		
- Estimated net greenhouse gas emission reduction due to use of electricity from RES		
- Estimated net greenhouse gas emission reduction due to use of energy from RES in heating and cooling systems		
- Estimated net greenhouse gas emission reduction due to use of energy from RES in the transport sector		

11. Please specify (for the preceding 2 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 breakdown 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 systems. 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 No. 89 of 29 February 1996. The 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 No. 39 of 16 February 2010 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 oblast and two mobile waste incineration installations in Kharkiv are used.

According to Ukrainian statistics in 2020, 462.4 million tons of waste were formed (excluding the Autonomous Republic of Crimea and part of the anti-terrorist operations area) and incinerated to generate 1008 thousand tons of energy.

According to the categories of waste incinerated for energy purposes, biomass-related materials were present, which notably represent 824.1 thousand tons, in particular:

- waste paper and cardboard — 0.3 thousand tons;
- wood waste — 343.6 thousand tons;
- - phytogenic waste — 480.2 thousand tons.

Thus, the share of biodegradable waste in the waste incinerated for energy purposes is 81.8%.

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.