



MINISTRY OF CLIMATE

2017-18 Progress Report on the promotion and use of energy from renewable sources in Poland

(prepared on the basis of Article 127(2) of the Renewable Energy Act)

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Introduction

Article 22(1) 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 and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (OJ L 140, 5.6.2009, p. 16, as amended) requires all Member States to submit a report to the European Commission on progress in the promotion and use of energy from renewable sources by 31 December 2011, and every two years thereafter. The Minister for Energy carries out the required reporting to the European Commission under Article 127(2) of the Renewable Energy Act of 20 February 2015 (Journal of Laws 2017, item 261, as amended), which transposes the Member States' reporting requirements set out in Article 22(1) of Directive 2009/28/EC.

Member State reports are used by the Commission to monitor overall renewable energy policy developments and Member State compliance with the measures set out in Directive 2009/28/EC and the National Renewable Energy Action Plan of each Member State. The data included in the reports will also serve to measure the impacts referred to in Article 23 of Directive 2009/28/EC.

In order to ensure that the reports prepared by Member States are complete and comparable, the Commission has issued a fixed template covering all the requirements laid down in Article 22 of Directive 2009/28/EC. The template is based to a large extent on the format of the National Renewable Energy Action Plans¹.

The data in this report concern the two-year period immediately preceding the 2019 reporting year, i.e. 2017-18. The report also contains information on legislative measures with a direct impact on the development of renewable energy taken up to the time of drafting this report.

The data presented below and in the previous report show that the production and consumption of renewable energy is following an upward trend in Poland, despite renewables representing a smaller share overall in 2017. However, the measures which have been taken are designed to achieve the intermediate and final targets laid down in Directive 2009/28/EC. The assumption is that the amendments made to the Biocomponents and Liquid Biofuels Act (e.g. introduction of an obligatory blending mechanism) and the optimisation of support schemes for producers of electricity from renewable energy sources (RES), proposed deregulation and administrative simplification under the Renewable Energy Act will eliminate negative phenomena on the renewable energy market and thereby stimulate further growth in renewable energy.

Decisions taken by the European Commission and legal solutions adopted at EU level on matters such as sustainable development are also important for further RES development in Poland. For growth in RES to be achieved, it is vital to ensure a level playing field and for the

¹ Commission Decision of 30 June 2009 establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC of the European Parliament and of the Council (notified under document number C(2009) 5174) (Text with EEA relevance); 2009/548/EC.

same requirements as those applicable in the EU under the Common Agricultural Policy and environment law to apply, e.g. to biomass from third countries.

Poland's energy efficiency policy has been defined in several documents, the most important of which are:

- *Poland's energy policy to 2030*;
- *Strategy for Responsible Development to 2020 (with a view to 2030)*;
- *National Energy Efficiency Action Plans (2007, 2011, 2014 and 2017)*.

Data from Statistics Poland (*Energy efficiency from 2007 to 2017*, Warsaw 2019) show that Poland has made significant progress in terms of increasing energy efficiency. Over the period 2007-17, the ODEX² index, which demonstrates progress in energy intensity, decreased from 79.4 to 66.0 compared with the base year. The average rate of improvement was 1.8% per year. The processing industry registered the fastest rate of improvement (2.7% per year), with an index value of 46.5 in 2017. The slowest rate of improvement was seen in the households sector, with an annual improvement of 1.3% between 2008 and 2017. The average rate of improvement in the transport sector was 2.3%, with an index value of 73.4 in 2017.

On 23 January 2018, the Fourth National Energy Efficiency Action Plan for Poland 2017 was adopted by the Cabinet. This document sets out energy efficiency improvement measures per sector of final energy consumption and calculations regarding final energy savings achieved over the period 2008-15 and due to be achieved in 2020. The measures included in the National Energy Efficiency Action Plan are expected to enable the national energy efficiency target to be met by 2020, namely a reduction in primary energy consumption of 13.6 Mtoe³ between 2010 and 2020, thereby also increasing the energy efficiency of the national economy. According to the 2017 National Energy Efficiency Action Plan, primary energy savings of 5.37 Mtoe were achieved in 2015.

²The ODEX index is calculated by aggregating changes in unit energy consumption, observed over a given period of time at certain levels of end use. It does not show the current level of energy intensity, but progress in relation to the base year. A drop in the value of the index means an increase in energy efficiency. To reduce accidental fluctuations, ODEX is calculated as a 3-year moving average.

³ Mtoe (millions of tonnes of oil equivalent), 1 Mtoe = 41868000 GJ.

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding two years (2017-18) (Article 22(1)(a) of Directive 2009/28/EC).

Table 1 shows the actual share and consumption of energy from renewable sources during the 2017-18 reporting period. The surplus RES share for the cooperation mechanism was calculated as the difference between the total actual RES share and the minimum RES share under the trajectory calculated in accordance with Annex I to Directive 2009/28/EC. The table corresponds to Table 3 from the NREAP. Data from the previous report and from Table 1 show that the total share of energy from renewable sources decreased in 2017 as a result of dynamic economic growth which led to an increase in energy demand. Changes to the RES support scheme nevertheless had a decisive influence on this (with the introduction of an auction system in 2015 to replace the green certificate system). As a consequence, the protracted notification process ended in a positive decision from the European Commission on 13 December 2017. However, the Ministry of Climate emphasises that the 2020 targets regarding the share of RES remain valid and achievable, as shown by the rebound in the total RES share in 2018 resulting from enhanced corrective measures.

Table 1:
The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources⁴

	2017	2018
RES-H&C ⁵ (%)	14.60	14.79
RES-E ⁶ (%)	13.09	13.03
RES-T ⁷ (%)	4.20	5.63
Overall RES share ⁸ (%)	10.96	11.28
<i>of which from cooperation mechanism⁹ (%)</i>	0.00	0.00
<i>Surplus for cooperation mechanism¹⁰ (%)</i>	-1.31	-0.99

Source: Statistics Poland and own calculations by the Ministry of Climate based on data from Statistics Poland and the trajectory established for Poland in Directive 2009/28/EC.

Table 1a contains RES consumption values for each sector and gross total RES consumption (in ktoe¹¹). The table corresponds to Table 4a from the NREAP.

⁴ Facilitates comparison with Table 3 and Table 4a of the NREAPs.

⁵ Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)(b) and 5(4) of Directive 2009/28/EC divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

⁶ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Articles 5(1)(a) and 5(3) of Directive 2009/28/EC) divided by total gross final consumption of electricity. The same methodology as in Table 3 of NREAPs applies.

⁷ Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)(c) and 5(5) of Directive 2009/28/EC) divided by consumption in transport of 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). The same methodology as in Table 3 of NREAPs applies.

⁸ Share of energy from renewable sources in gross final consumption. The same methodology as in Table 3 of NREAPs applies.

⁹ In percentage points of overall RES share.

¹⁰ In percentage points of overall RES share.

¹¹ ktoe (kilotonne of oil equivalent), 1 ktoe = 41,868 GJ.

Table 1a:**Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)¹²**

	2017	2018
(A) Gross final consumption of RES for heating and cooling	5579.9	5587.0
(B) Gross final consumption of electricity from RES	1856.5	1875.4
(C) Gross final consumption of energy from RES in transport	687.3	1000.7
(D) Gross total RES consumption ¹³	8123.6	8463.0
(E) Transfer of RES to other Member States	0.0	0.0
(F) Transfer of RES from other Member States and 3rd countries	0.0	0.0
(G) RES consumption adjusted for target (D)-(E)+(F)	8123.6	8463.0

Source: Statistics Poland

Table 1b presents the installed capacity of individual technologies in the electricity sector (in MW). It also indicates renewable electricity consumption values in the electricity sector (in GWh). The table corresponds to Tables 10a and 10b from the NREAP. It contains information on the status of RES technical infrastructure.

Table 1b:

Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Poland to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity¹⁴

	2017		2018	
	MW	GWh	MW	GWh
Hydro ¹⁵ :	2390.1	2326.9	2390.8	2335.3
non pumped	591.1	2088.8	591.8	2095.2
<1 MW	92.1	325.3	91.8	324.8
1MW–10 MW	182.2	643.7	183.5	649.9
>10 MW	316.8	1119.8	316.5	1120.5
pumped	1423.0	-	1423.0	-
mixed ¹⁶	376.0	238.1	376.0	240.1
Geothermal	0.0	0.0	0.0	0.0
Solar:	287.1	165.5	562.0	300.5
photovoltaic	287.1	165.5	562.0	300.5
concentrated solar power	0.0	0.0	0.0	0.0
Tide, wave, ocean	0.0	0.0	0.0	0.0
Wind:	5759.4	13570.8	5766.1	13655.9
onshore	5759.4	13570.8	5766.1	13655.9
offshore	0.0	0.0	0.0	0.0
Biomass ¹⁷ :	938.0	6405.0	960.6	6460.8
solid biomass	708.8	5308.6	735.2	5333.2
biogas	229.2	1096.4	225.5	1127.6
bioliquids	0.0	0.0	0.0	0.0

¹² Facilitates comparison with Table 4a of the NREAPs¹³ In accordance with Article 5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources is only considered once. No double counting is allowed.¹⁴ Facilitates comparison with Table 10a of the NREAPs¹⁵ Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.¹⁶ In accordance with new Eurostat methodology.¹⁷ Taking into account only those bioliquids and biofuels complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

TOTAL	9374.5	22468.2	9679.4	22752.5
<i>of which in CHP</i>	-	4992.0	-	4962.7

Source: Statistics Poland

Table 1c:

Total actual contribution (final energy consumption¹⁸) from each renewable energy technology in Poland to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)¹⁹

	2017	2018
Geothermal (excluding low temperature geothermal heat in heat pump applications)	22.6	23.7
Solar	54.5	56.9
Biomass ²⁰ :	5376.8	5373.9
<i>solid biomass</i>	5272.4	5269.7
<i>biogas</i>	104.4	104.2
<i>bioliquids</i>	0.0	0.0
Renewable energy from heat pumps:	56.5	59.7
- of which aerothermal	2.3	2.9
- of which geothermal	10.6	11.1
- of which hydrothermal	3.1	3.0
TOTAL	5510.4	5514.1
<i>Of which DH²¹</i>	0.0	0.0
<i>Of which biomass in households²²</i>	2620.7	2579.9

Source: Statistics Poland

Table 1d contains RES consumption values for the transport sector, broken down by technology (in ktoe).

Data on the quantity of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC were not compiled until 2019. This was due to the fact that the deadline for implementing Directive (EU) 2015/1513 was 10 September 2017. The Directive was transposed into Polish law by way of the Act of 24 November 2017 amending the Biocomponents and Liquid Biofuels Act and certain other acts, entering into force on 1 January 2018.

As such, data on the quantity of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC and used in Poland to meet the binding targets were first made available for the year 2018.

¹⁸ Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.

¹⁹ Facilitates comparison with Table 11 of the NREAPs.

²⁰ Taking into account only those bioliquids complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

²¹ District heating and/or cooling from total renewable heating and cooling consumption (RES- DH).

²² From total renewable heating and cooling consumption.

Table 1d:

Total actual contribution from each renewable energy technology in Poland to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)^{23, 24}

	2017	2018
- Bioethanol	176.16	172.84
- Biodiesel (FAME)	428.73	739.57
- Hydrotreated Vegetable Oil (HVO)	-	-
- Biomethane	-	-
- Fischer-Tropsch diesel	-	-
- Bio-ETBE	-	-
- Bio MTBE	-	-
- Bio-DME	-	-
- Bio-TAEE	-	-
- Biobutanol	-	-
- Biomethanol	-	-
- Pure vegetable oil	-	-
Total sustainable biofuels	604.89	912.40
Of which		
sustainable biofuels produced from the feedstocks listed in Annex IX Part A	0.00	0.00
other sustainable biofuels eligible for the target set out in Article 3(4)(e)	0.00	0.00
sustainable biofuels produced from the feedstocks listed in Annex IX Part B	0.00	0.00
sustainable biofuels for which the contribution towards the renewable energy target is limited under Article 3(4)(d)	604.89	912.40
Imports from third countries	-	-
Hydrogen from renewables	0.00	0.00
Renewable electricity	82.39	88.31
Of which		
consumed in road transport	0.66	0.72
consumed in rail transport	75.92	81.48
consumed in other transport sectors	5.81	6.11
Other	0.00	0.00

Source: Statistics Poland

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

**Table 2:
Overview of all policies and measures**

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
1. Increasing maximum capacity of micro-installations from 40 kW to 50 kW	Regulatory	Increased use of energy from RES	Energy producers using micro-installations with an installed capacity of up to 50 kW	Existing	Since 2018
2. Changing ceiling for small installations from 40 kW to	Regulatory	Increased use of energy from RES	Energy producers using small installations with	Existing	Since 2018

²³ For biofuels taking into account only those compliant with the sustainability criteria, cf. Article 5(1) last subparagraph.

²⁴ Facilitates comparison with Table 12 of the NREAPs.

50 kW and from 200 kW to 500 kW			an installed capacity of between 50 and 500 kW		
3. Increasing minimum capacity of RES installations subject to licensing from 200 kW to 500 kW	Regulatory	Simplified administrative procedures for energy production by small RES installations	Energy producers using small installations with an installed capacity of between 200 and 500 kW	Existing	Since 2018
4. Facilitating connection of micro-installations to electricity grid	Regulatory	Simplified administrative procedures for energy production by micro-installations	Energy producers using micro-installations with an installed capacity of up to 50 kW	Existing	Since 2013
5. Requiring sellers to cover commercial balancing costs for installations of up to 500 kW.	Regulatory/ financial	Increased use of energy from RES	Energy producers using RES installations with an installed capacity of between 50 and 500 kW	Existing	Since 2018
6. Facilitating installation of heat pumps and photovoltaic systems	Regulatory	Simplified administrative procedures for energy production by micro-installations	Energy producers using heat pumps and photovoltaic systems with an installed capacity of up to 50 kW	Existing	Since 2013
7. New forms of support for RES installations in the form of a fixed guaranteed purchase price system – feed-in-tariff (FIT) and a system of premiums on top of the market price – feed-in-premium (FIP)	Regulatory/ financial	Increased use of energy from RES	Energy producers using hydroelectric and biogas installations with capacity of less than 500 kW and installations with capacity not exceeding 1 MW	Existing	Since 2018
8. Introducing option for first-time electricity producers who begin generating electricity to use auction scheme even before winning auction for ‘new installations’	Regulatory	Increased use of energy from RES	Energy producers using installations producing electricity from onshore wind energy	Existing	Since 2018
9. Introducing option of ‘modernising’ functioning wind power plants ¹⁾ (i.e. implementing other activities necessary to their correct operation)	Regulatory	Increased use of energy from RES	Wind energy producers	Existing	Since 2018
10. Producing information booklets regarding energy clusters	Soft	Increased use of energy from RES	RES energy producers	Existing	Since 2018
11. Introducing co-financing to implement measures related to the production and use in transport of biocomponents, liquid biofuels and other renewable fuels	Regulatory/ financial	Increased use of biocomponents, liquid biofuels and other renewable fuels in transport	<ul style="list-style-type: none"> - biocomponent producers - liquid fuel and liquid biofuel producers - farmers producing liquid biofuels for their own use - public transport providers - scientific bodies and consortia - entrepreneurs - chambers of commerce - charities - employer associations - associations - farm advisory bodies - local government units 	Existing	Since 2013

* Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).

** Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?

*** Who are the targeted persons: investors, end users, public administration, planners, architects, installers, etc.? Or what is the targeted activity/sector: biofuel production, energetic use of animal manure, etc.?

****Does this measure replace or complement measures contained in Table 5 of the NREAP?

¹⁾ Amendments to Article 12 of the Investments in Wind Power Plants Act of 20 May 2016 (Journal of Laws 2019, items 654 and 1524) made pursuant to Article 3(4) of the Act of 7 June 2018 amending the Renewable Energy Act and certain other acts (Journal of Laws, item 1276) dated 14 July 2018.

Source: In-house study

Furthermore, a number of new provisions were added to the Renewable Energy Act in 2019 covering aspects such as:

- the possibility of extending the duration of connection contracts for existing RES projects,
- extending the list of RES prosumers to include entrepreneurs for whom producing electricity exclusively from RES for their own needs using micro-installations is not their principal economic activity,
- promoting the development of energy cooperatives²⁵.

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

Administrative procedures concerning the use of energy from renewable sources have been optimised to ensure they are adequate and proportionate to the development of the large-scale (industrial) energy sector, which is reflected in new installed capacity.

The Renewable Energy Act, the first law entirely dedicated to renewable energy, ensures implementation of the RES development objectives laid down in official Cabinet papers, i.e. Poland's energy policy to 2030 and the National Action Plan (NAP), and the continued coordination of the authorities' activity in this field.

The Act helps to ensure that measures, e.g. to implement a scheme of optimised aid mechanisms for producers of electricity from RES, with a particular focus on dispersed generation based on local resources, are cohesive and effective.

Under the Renewable Energy Act, as of 1 July 2016 operators can apply for aid through an auction scheme. Auctions organised by the President of the Energy Regulatory Office are won by the traders offering energy generation from RES at the lowest price, exclusive of VAT, and whose combined bids do not exceed 100% of the value or volume of electricity from RES specified in the auction notice and 80% of the volume of electricity covered by all the submitted bids. The winner thus receives aid in the form of a guaranteed purchase price for its electricity for a period of 15 years at the rate bid for in the auction, adjusted for inflation.

This also entitles the owners of the RES installations which win the auction to receive a 'negative balance', i.e. a monthly payment representing the difference between the auction price offered by the producer and the market price for electricity, subject to the maximum volume of electricity bid for at the auction. The auction support scheme is designed to enable the planned development of renewable energy to take place at the lowest possible cost to customers.

Amendments to the Renewable Energy Act dated 7 June 2018 introduced a raft of improvements to the auction scheme. In particular, amendments were made to the distribution of 'auction baskets' for the sale of electricity generated by renewable energy installations for which reference prices are set.

In addition, the list of installations generating electricity from renewable energy sources (for

²⁵ Legislative work is underway on the draft Regulation of the Minister for Climate on the registration, balancing, sharing of measurement data and billing of energy cooperatives, exercising the delegation of powers under Article 38c(14) of the Renewable Energy Act (draft still to be included in legislative work programme of the Ministry of Climate).

Draft Regulation defining the technical conditions for the registration, balancing, sharing of measurement data and billing of energy cooperatives.

which reference prices are published) was extended to installations with capacity of less than 500 kW. In view of the specific nature of the competitiveness of renewable energy technologies and, in particular, the capacity of small energy producers (especially in biogas installations and small hydropower plants), reference prices for the electricity produced by these installations are set at a higher level. Identifying reference prices for these installations therefore enables small electricity producers to bid a higher price for the sale of electricity under the auction scheme than energy producers in installations of the same type with a greater installed capacity, while complying with the competition rules. Furthermore, the reference price levels have a direct bearing on the amount of aid received under the feed-in tariff and feed-in premium systems.

The dedicated support schemes introduced by the 2018 amendments for small producers of electricity from renewable energy sources using selected technologies (installations with installed capacity of less than 500 kW and installed capacity of not more than 1 MW) are primarily • feed-in tariff (FIT); • feed-in premium (FIP) business-friendly systems addressed to RES installations using hydropower, biogas and agricultural biogas with installed capacity of less than 500 kW (FIT) and installed capacity of not less than 500 kW and not more than 1 MW (FIP).

Pursuant to Article 70c(6)(1) of the Renewable Energy Act, producers of electricity in installations with installed capacity of less than 500 kW (Article 70a(1) of the Renewable Energy Act) may also opt for payment under the FIP system (right to receive the negative balance).

The situation in the wind energy sector has also been resolved by introducing the option of ‘modernising’ functioning wind power plants²⁶ (i.e. implementing other activities necessary to their correct operation) and harmonising the tax rules.

Following changes in the regulatory environment, RES auctions were planned and carried out in 2017 and 2018, with the result that contracts were signed for significant volumes of electricity generated from RES (including 1,100 MW of new wind power generation and 550 MW of new photovoltaic power generation in 2018).

In addition, the number of prosumers grew more rapidly in 2017 and 2018, fluctuating between 0.7 or 0.8 and 1 of electricity fed into the grid as a percentage of electricity taken, which depends on the capacity of micro-installations (discounts). By end-2018 the number of prosumers was greater than 54,000, while installed capacity amounted to almost 343 MW for installations of this type, representing an increase of 235% in both cases in relation to end-2016.

As a result of activities carried out in this area in 2019, a group of business operators was added to the list of prosumers.

Prosumers can also benefit from dedicated support schemes provided *inter alia* by the National Fund for Environmental Protection and Water Management. Under the Renewable Energy Act, it is also possible to obtain aid under existing and future support schemes using EU funds such as ROPs and RDPs.

²⁶ Amendments to Article 12 of the Investments in Wind Power Plants Act of 20 May 2016 (Journal of Laws 2016, items 654 and 1524) made pursuant to Article 3(4) of the Act of 7 June 2018 amending the Renewable Energy Act and certain other acts (Journal of Laws, item 1276) dated 14 July 2018.

In 2018 the National Fund for Environmental Protection and Water Management launched the ‘Clean Air’ scheme, which aims to reduce emissions into the atmosphere of harmful substances by single-family houses using obsolete heat generators and low-quality fuel. The scheme provides funding for the replacement of old and inefficient solid fuel heat generators by modern heaters that meet the highest standards and for the requisite thermal modernisation work in buildings. It is addressed to owners or co-owners of single-family houses. Under the scheme, 3.5 million houses will be made more energy efficient, 3 million inefficient heat generators will be replaced by low-emission heaters in existing buildings, 50,000 low-emission heaters will be installed in newly-built buildings and installed photovoltaic cells will receive additional electricity generation capacity of at least 3,000 MW.

As at 22 November 2019 the number of funding applications for heating technologies in new buildings under the ‘Clean Air’ scheme had reached 26,000, of which more than 8,000 (32%) were for ground and air-source heat pumps and almost 4,500 (17%) for biomass boilers. In existing buildings heat pumps account for 9% of the heating appliances indicated in applications. Biomass boilers represent 22%.

In 2019 the National Fund for Environmental Protection and Water Management started setting up more schemes to support investment in RES. Of particular note is the ‘My electricity’ priority scheme with a budget of PLN 1 billion, which funds photovoltaic micro-installations with installed capacity between 2 kW and 10 kW. 200,000 of these installations with total installed capacity of approx. 1,200 MW are to be set up under this scheme. As at 30 December 2019, the total number of applications submitted under the scheme exceeded 18,000 and the amount of aid awarded equalled PLN 91 million, which has already been translated into more than 100 MW of installed capacity in photovoltaic micro-installations.

On the basis of a national funding offer, the National Fund for Environmental Protection and Water Management operates a raft of schemes which, directly or indirectly, contribute to air quality and efforts to combat smog and energy poverty. Beneficiaries include local authorities, private companies and individuals. In 2019, a call for proposals was launched under the District Heating — Pilot’ priority scheme (the beneficiaries are heating companies with a stake of at least 70% in JST’s capital, the budget is PLN 500 million) and the ‘Energy Plus’ priority scheme (the beneficiaries are companies, the budget is PLN 4 billion). These schemes are designed to reduce the negative impact of businesses on the environment, including improvements to air quality, by supporting investment projects e.g. in RES. The Fund has also launched a dedicated scheme for farmers focusing mainly on small individual energy sources, the ‘Agroenergy’ priority scheme with a budget of PLN 200 million. The scheme facilitates comprehensive support to reduce the environmental impact of farming by funding investments to boost energy independence in rural areas, which will help to increase local energy security and, amongst other things, improve air quality. The National Fund for Environmental Protection and Water Management is also implementing the ‘Polska Geotermia Plus’ scheme with a budget of PLN 600 million, which will contribute to the development, and increase the use, of geothermal resources in Poland. Another National Fund for Environmental Protection and Water Management scheme designed to support the implementation of geothermal projects in 2017-18 is the ‘Geology and Mining’ priority scheme part 1) Learning about Poland’s geology and management of mineral deposits and groundwater resources, the purpose of which is to identify potential uses for geothermal

resources, i.e. deposits of thermal water and dry rock geothermal energy. In 2017-18, within the framework of that scheme, the Minister for the Environment, assisted by Poland's head geologist, approved funding of almost PLN 200 million for ten geothermal projects. The approved projects were put forward by local authorities, i.e. municipalities. Giving the green light to ten geothermal projects in various parts of the country will significantly increase the number of thermal water outlets in Poland and will boost the district heating sector as well (some of the applications submitted under this scheme also provided for electricity generation). In addition, since 2017 the Ministry of the Environment has been implementing the 'Developing and exploiting Poland's geothermal potential' strategic project, which forms part of the Strategy for Responsible Development to 2020 (with a view to 2030) and aims to create the right conditions for the promotion and development of renewable energy based on geothermal sources. These schemes are a comprehensive aid instrument facilitating the development of new heat and electricity sources (including RES) and energy storage facilities.

On 8 October 2018 the Minister for Energy appointed the team responsible for producing a model for the operation of the heat market, which serves as an advisory body to the Minister, and tasked it with analysing the current state of the heat market in Poland and identifying arrangements to facilitate its future development. Some of the anticipated results of its activities are that the share of network heat accounted for by RES will be boosted (an increase in the share of heating from RES of 1,1 pps/a to 2030), that 85% of district heating or cooling systems in which capacity requested by customers exceeds 5 MW will comply with the energy efficient district heating system criterion by 2030 and that 100% of households' thermal needs will be covered by network heat or by low-carbon heating units by 2040.

The idea, first floated in 2016, of introducing and developing energy clusters in Poland has met with great interest not only on the part of the dispersed energy sector, but also - indeed mainly - on the part of local communities. Developing the energy cluster concept gives rise to stable energy supplies and self-sufficiency at district, municipal or local level, thanks *inter alia* to the construction of new, small generation sources which generate electricity locally. According to the definition set out in Article 2(15a) of the Renewable Energy Act, an energy cluster is a civil-law agreement between companies concluded for the purpose of generating and balancing demand, distribution or sales of energy from renewables or from other sources or fuel in a specific area. Energy clusters are represented by a coordinator, who may be any member of the cluster. Energy clusters do not have legal capacity, i.e. they do not have rights and responsibilities. In practice, therefore, it is necessary to designate, within the energy cluster, economic operators (e.g. commercial companies, associations or energy cooperatives) which, amongst other things, can supply energy at an operational level, thus enabling the members of the cluster to achieve self-sufficiency.

In the light of the above, we would emphasise that the efficiency of energy clusters depends to a large extent on the rational and efficient use of local innovation and enterprise potential. Indeed, the essence of this agreement is the self-organisation of the bodies forming part of the cluster, the aim being to create a small, free-standing area of energy generation and consumption. As such, excessive interference by the legislator in energy clusters' activities in the form of a rigid legal framework may be incompatible with the very notion of an energy cluster.

Nevertheless, the activities of the Ministry of Climate (formerly the Ministry of Energy) in this field will focus in future on clarifying provisions regulating the operation of energy clusters designed to create optimal economic, legal and organisational conditions for innovative projects of this type and for the promotion of a cluster model. The Ministry of Climate assumes that in future energy clusters will become a regional development policy tool deployed within the framework of ‘territorial contracts’ while also helping to achieve national RES targets.

The Ministry of Energy held two competitions for the Energy Cluster Pilot Certificate in 2017-18. 115 initiatives from 15 provinces took part in the first competition and certificates were awarded to 33 of them. 84 initiatives from 14 provinces took part in the second competition. In this instance too, 33 certificates were awarded. In total, 66 of the best participants received awards.

Another reason for developing the energy cluster concept is the ‘KlastER - Development of dispersed energy in energy clusters’ project conducted by the Ministry of Climate, which is the consortium leader (together with the University of Science and Technology (*Akademia Górniczo-Hutnicza*) and the National Centre for Nuclear Research). This project is being implemented under the Gospostrateg strategic initiative funded by the NCBR). The studies produced as part of the ‘Preparation of the concept of energy cluster deployment’ initiative, funded by the 2014-20 Technical Assistance Operational Programme and implemented pursuant to the Agreement of 11 April 2018 between the Minister for Investment and Development and the Minister for Energy will also help to prepare the concept of energy cluster deployment in Poland. There are plans to draft a dispersed energy generation bill based on those studies.

As regards biocomponents used for liquid fuels and liquid biofuels, you are referred to the Act of 24 November 2017 amending the Biocomponents and Liquid Biofuels Act and certain other acts (Journal of Laws 2017, item 2290) which has entered into force, in particular in the light of the need to transpose Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources (OJ L 239, 15.9.2015, p. 1) into Polish law.

In view of the above, the main changes introduced by the Biocomponents and Liquid Biofuels Act concerned:

- 1) a restriction on the use of biocomponents produced from cereal and other starch-rich crops, sugars and oilseeds and from other crops grown as main crops primarily for energy purposes on agricultural land (a 7% cap was introduced in 2020);
- 2) promotion of the use of biofuels produced from the feedstocks listed in Annex IX to Directive 2009/28/EC; arrangements were introduced whereby each of the feedstocks listed in Annex IX authorised double counting for operators implementing the NIT and required them to use biocomponents from these feedstocks at a rate of 0.1% in 2020;
- 3) minimum emission levels were updated in accordance with the revised requirements of Article 17(2) of Directive 2008/29/EC.

In addition, with a view to effectively promoting the use of biofuels produced from waste feedstocks, Annex IX to Directive 2009/28/EC and a list of the provisions enabling the NIT to take account of biofuels authorising double counting were incorporated into the Biocomponents and Liquid Biofuels Act.

Apart from activities directly linked to the transposal into national law of Directive (EU) 2015/1513, the 2017 amendments to the Biocomponents and Liquid Biofuels Act also made provision for arrangements to make implementation of the RES target in transport more efficient. These arrangements include:

- 1) the introduction of obligatory blending, i.e. an obligation to add a specific (minimum) quantity of biocomponents to petrol and diesel which is calculated on the basis of the calorific value of the added biocomponents (the obligation to add biocomponents to liquid fuels applies throughout the calendar year and is accounted for on a quarterly basis);
- the option of implementing the NIT using co-processing, combined with investment activities allowing for increased use to be made of this technology in Poland in the coming years and the development of a methodology to calculate the quantity of biocomponents generated by co-processing;
- 3) the introduction of a ban on issuing proof of sustainability by operators implementing the NIT for biocomponents which they have already used for that purpose, coupled with the introduction of penalties for non-compliance;
- 4) the introduction of amendments to Article 14 of the Biocomponents and Liquid Biofuels Act, which regulates the production of biofuels by farmers for their own use. An amendment allowing farmers without a tax warehouse to carry out these activities has been adopted. They will be able to produce liquid biofuels for their own use outside a tax warehouse by applying the excise duty advance payments referred to in the Excise Duty Act of 6 December 2008.

Various amendments have also been adopted with a view to streamlining specific procedures governing the operation of the market, particularly reporting by supervisory bodies such as the Agricultural Market Agency (later the National Centre for Agricultural Assistance) and the Energy Regulatory Office.

Further analyses have been carried out with a view to checking the feasibility of the 2020 RES target in transport.

2.b. Information on measures for ensuring the transmission and distribution of electricity produced from renewable energy sources and for improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (*Article 22(1)f) of Directive 2009/28/EC*).

Pursuant to Article 7(1) of the Energy Act of 10 April 1997 (Journal of Laws 2019, item 755, as amended), energy companies transporting or distributing electricity are required to conclude a grid connection contract with parties applying for a grid connection on the basis of equal treatment and connecting, as a priority, installations using RES, insofar as the technical and economic conditions for connection to the grid and supply of that electricity obtain, and the applicant complies with the conditions for grid connection and take-up.

In accordance with Article 7(2a) of the Act, grid connection contracts for RES installations, in addition to general provisions, should also include provisions specifying that:

- 1) the period of time which elapses between the contract being signed and the electricity generated by those installations being supplied to the grid for the first time may be no more than 48 months or, in the case of offshore wind installations, 120 months;

2) failure to supply electricity generated by those installations for the first time within the time limit specified in the grid connection contract constitutes grounds for terminating the contract.

In addition, pursuant to Article 7(8)(3)(a) of the Act, half of the fee calculated on the basis of real inputs is charged for connecting RES installations with installed capacity of 5 MW or less.

Energy companies transporting or distributing gaseous fuels or electricity must draw up a development plan for the area in which they operate indicating how they will meet current and future demand for gaseous fuels or electricity over at least the next 3 years.

The plan should indicate details of measures to modernise, extend or construct the grid and of planned new sources of gaseous fuels or electricity, including RES installations. The plan should also take account of demand for new capacity in the transmission or distribution system reported by grid customers or applicants for a grid connection.

Pursuant to the Energy Act, customers can connect micro-installations to the grid under a simplified procedure known informally as the 'on request' procedure.

Under Article 7(8d)⁴ of the Energy Act, in cases where customers requesting a connection to the distribution grid for micro-installations are connected to the grid as the final customer, and the installed capacity of the micro-installations for which they have applied for a connection is not greater than that specified in the connection conditions, connection to the grid takes place on the basis of the micro-installations' connection request to the relevant electricity company following the installation of the appropriate safety equipment and meter.

The cost of installing safety equipment and a meter for micro-installations is borne by the operator of the electricity distribution system.

Prosumers benefit from fee waivers. They do not pay - settlement fees to the seller based on the volume of electricity settled under the discount scheme;

- distribution service fees, the amount of which varies according to the volume of electricity taken by the prosumer; these fees are paid by the seller to the operator of the electricity distribution system to whose grid the micro-installations have been connected; accordingly, the volume of electricity fed by the prosumer into the grid surplus to the volume of electricity taken by them from the grid can be used by the seller to cover settlement costs, including distribution service fees.

3. Information on support schemes and other measures currently in place that are applied to promote energy from renewable sources and 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).

Support schemes for the generation of electricity from renewable energy sources

Certificates of origin scheme

In accordance with the Commission decision of 2 August 2016 in case SA.37345 (2015/NN) - Polish certificates of origin system to support renewables and reduction of burdens arising from the renewables certificate obligation for energy intensive users, as of 1 July 2016

this system is closed to new installations, which should also be understood as meaning that additional generation capacity resulting from the extension of existing RES installations using the certificates of origin system is not eligible for aid. This system is gradually being phased out.

Auction scheme

The auction support scheme for the generation of electricity from renewable energy sources, regulated by the Renewable Energy Act, was introduced in 2016. In principle, this scheme is characterised by competition between the parties to the auction, which should ensure the most favourable prices for electricity, impacting in turn on the cost of electricity consumed by final customers. The legislator assumed that the support scheme applied to date in the form of certificates of origin for electricity produced from renewable energy sources would be replaced by the auction scheme, and that producers would gradually migrate to the new scheme as a result.

Over the period 2015-18 multiple amendments were made to the rules governing the operation of this scheme and the rules governing auctions were amended too. Between 2016 and 2018 a total of 23 auctions were announced, 19 took place and 11 were concluded. Data on concluded auctions are presented in the following tables.

Overview 1. Data on auctions concluded to date for the purchase of energy from RES

Auction number	Contracted volume of electricity [MWh]	Contracted value of electricity [PLN]
2016	2 808 471.358	1 124 881 928.18
AZ/1/2016	824 629.000	415 358 262.21
AZ/3/2016	1 567 288.818	554 474 643.01
AZ/4/2016	416 553.540	155 049 022.96
2017	5 033 403.146	1 876 053 955.64
AZ/1/2017	4 720 961.816	1 760 121 889.27
AZ/2/2017	312 441.330	115 932 066.37
2018	56 161 735.012	14 218 493 365.55
AZ/6/2018	41 996 771.921	8 238 365 894.35
AZ/7/2018	above 972 000.000	388 000 000.00
AZ/9/2018	8 169 917.016	2 878 556 631.19
AZ/11/2018	3 489 766.000	1 972 333 472.66
AZ/12/2018	816,000.075	378 903 031.35
AZ/13/2018	717 280.000	362 334 336.00
TOTAL	64 003 609.516	17 219 429 249.37

Source: Energy Regulatory Office

FIT/FIP system

The amended provisions of the Renewable Energy Act introducing, *inter alia*, new forms of aid for electricity generation from renewable energy sources, i.e. FIT/FIP systems, entered into force on 14 July 2018.

According to Article 70a of the Renewable Energy Act, electricity producers using RES installations with total installed capacity of less than 500 kW who sell or will sell the unused electricity to the obliged vendor are eligible for the FIT system. The FIP system is intended for

electricity producers using RES installations with total installed capacity of not less than 500 kW and not more than 1 MW, who sell or will sell the unused electricity to a party other than the obliged vendor. As already indicated, pursuant to Article 70c(6)(1) of the Renewable Energy Act, producers of electricity using installations with installed capacity of less than 500 kW (Article 70a(1) of the Renewable Energy Act) may also opt for payment under the FIP system (right to receive negative balance).

According to Article 70a(1) and (2) of the Renewable Energy Act, FIT/FIP systems are dedicated to RES installations which solely use the following to generate electricity:

- 1) agricultural biogas, or
- 2) landfill biogas, or
- 3) sewage treatment plant biogas, or
- 4) biogas other than that indicated in paragraphs (1)-(3), or
- 5) hydropower.

Pursuant to Article 70e(1) of the Renewable Energy Act, the fixed purchase price in FIT/FIP systems amounts to 90% of the reference price set for the calendar year by regulation of the Minister for Energy (cf. Article 77(3)(1) of the Renewable Energy Act) applicable on the day on which the FIT/FIP declaration is submitted, where appropriate for installations using the type of renewable energy in question.

The following table provides an overview of the certificates issued in 2018 relating to the option of selling unused electricity at the fixed purchase price referred to in Article 70b(8) of the Renewable Energy Act, broken down by installation type.

Overview 2: data on certificates issued in 2018 relating to the option of selling unused electricity at a fixed purchase price

No	Type of installation	Number of certificates issued pursuant to Article 70b(8) of the Renewable Energy Act	Installed capacity [MW]
1	solely using agricultural biogas	6	3 317
2	solely using landfill biogas	32	15 830
3	solely using sewage treatment plant biogas	0	0.000
4	solely using biogas other than that indicated in Article 70a(1) and (2), paragraphs (1)-(3) of the Renewable Energy Act	0	0.000
5	solely using hydropower	257	57 654
	TOTAL:	295	76 801

Source: ENERGY REGULATORY OFFICE

Prosumer scheme

The Renewable Energy Act introduced a support scheme for prosumer energy which covers those electricity customers which also produce electricity in micro-installations (with total installed capacity of up to 50 kW). The difference between the volume of electricity fed into the grid by the prosumer and the volume of electricity taken from the grid is calculated at a ratio of 1 to 0.7, except for micro-installations with total installed electricity capacity of not more than 10 kW, for which this ratio is 1 to 0.8.

The system of discounts, which it is planned to amend and further develop in future, is in line with general trends in prosumer energy.

Table 3:
Support schemes for renewable energy

		Per unit support	Total [million EUR]* **	Per unit support	Total [million EUR]* **
		2017		2018	
A. Hydropower (electrical energy in MWh) ⁽¹⁾		803,646.16		565,258.71	
Instrument (provide data as relevant)	Obligation/quota (%) ⁽²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ⁽³⁾	38.34	30.81	45.51	25.72
	Average certificate price (EUR) ⁽⁴⁾	9.10	7.31	24.32	13.75
	Tax exemption/refund (EUR) ⁽⁵⁾	4.68	3.76	4.68	2.65
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁽⁶⁾	explanation below table			
	Production incentives				
	Feed-in tariffs (MWh) ⁽⁷⁾	-		3,913.40	
	Feed-in premiums (MWh) ⁽⁷⁾	-		5,704.88	
	Tendering:	not applicable			
B. Geothermal energy (electrical energy in MWh) ⁽¹⁾		0.00		0.00	
	Obligation/quota (%) ⁽²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ⁽³⁾	38.34	0.00	45.51	0.00
	Average certificate price (EUR) ⁽⁴⁾	9.10	0.00	24.32	0.00
	Tax exemption/refund (EUR) ⁽⁵⁾	4.68	0.00	4.68	0.00
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁽⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
C. Solar energy (electrical energy in MWh) ⁽¹⁾		81,685.91		94,547.88	
	Obligation/quota (%) ⁽²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ⁽³⁾	38.34	3.13	45.51	4.30
	Average certificate price (EUR) ⁽⁴⁾	9.10	0.74	24.32	2.30
	Tax exemption/refund (EUR) ⁽⁵⁾	4.68	0.38	4.68	0.44
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁽⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
D. Wave and tidal energy (electrical energy w MWh) ⁽¹⁾		0.00		0.00	
	Obligation/quota (%) ⁽²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ⁽³⁾	38.34	0.00	45.51	0.00
	Average certificate price (EUR) ⁽⁴⁾	9.10	0.00	24.32	0.00
	Tax exemption/refund (EUR) ⁽⁵⁾	4.68	0.00	4.68	0.00
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁽⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
E. Wind energy (electrical energy in MWh) ⁽¹⁾		14,951,718.57		12,790,976.72	
	Obligation/quota (%) ⁽²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ⁽³⁾	38.34	573.24	45.51	582.12
	Average certificate price (EUR) ⁽⁴⁾	9.10	136.06	24.32	311.08

	Tax exemption/refund (EUR) ⁵⁾	4.68	69.97	4.68	59.87
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
F. Biomass energy – solid (electrical energy in MWh) ⁽¹⁾		4,515,354.55		4,890,602.90	
	Obligation/quota (%) ²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾	38.34	173.12	45.51	222.57
	Average certificate price (EUR) ⁴⁾	9.10	41.09	24.32	118.94
	Tax exemption/refund (EUR) ⁵⁾	4.68	21.13	4.68	22.89
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tenders:	not applicable			
G. Biomass energy – biogas (electrical energy in MWh) ⁽¹⁾		1,035,254.60		1,010,542.00	
	Obligation/quota (%) ²⁾	100			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾	38.34	39.69	45.51	45.99
	Average certificate price (EUR) ⁴⁾	9.10	9.42	24.32	24.58
	Tax exemption/refund (EUR) ⁵⁾	4.68	4.84	4.68	4.73
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs (MWh) ⁷⁾	-	-	-	4,538.65
	Feed-in premiums (MWh) ⁷⁾	-	-	-	1,561.79
	Tendering:	not applicable			
H. Geothermal energy (heat in ktoe)		22.6		23.7	
I. Solar energy (heat in ktoe)		54.5		56.9	
J. Biomass energy - solid (heat in ktoe)		5,222.3		5,161.3	
K. Biomass energy - biogas (heat in ktoe)		104.4		104.2	
L. Heat pumps (heat in ktoe)		56.5		59.7	
M. Waste-to-energy (heat in ktoe)		-		-	
N. Bioethanol (transport in ktoe)		176.16		172.84	
	Obligation/quota (%) ²⁾	explanation below table			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾	explanation below table			
	Average certificate price (EUR) ⁴⁾	explanation below table			
	Tax exemption/refund (EUR) ⁵⁾	explanation below table			
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
O. Biodiesel (transport in ktoe)		428.73		739.57	
	Obligation/quota (%) ²⁾	explanation below table			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾	explanation below table			
	Average certificate price (EUR) ⁴⁾	explanation below table			
	Tax exemption/refund (EUR) ⁵⁾	explanation below table			
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾	explanation below table			
	Production incentives	not applicable			
	Feed-in tariffs	not applicable			
	Feed-in premiums	not applicable			
	Tendering:	not applicable			
P. Electrical energy (transport in ktoe)		82.39		88.31	
	Obligation/quota (%) ²⁾	not applicable			
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾	not applicable			

	Average certificate price (EUR) ⁴⁾		
	Tax exemption/refund (EUR) ⁵⁾		
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾		
	Production incentives		
	Feed-in tariffs		
	Feed-in premiums		
	Tendering:		
R. Other (e.g., biogas, plant oils etc.) - (transport in ktoe)		0.00	0.00
	Obligation/quota (%) ²⁾		
	Penalty/Buy out option/ Buy out price (EUR/MWh) ³⁾		
	Average certificate price (EUR) ⁴⁾		
	Tax exemption/refund (EUR) ⁵⁾		
	Investment subsidies (capital grants or loans) (EUR/MWh) ⁶⁾		
	Production incentives		
	Feed-in tariffs		not applicable
	Feed-in premiums		
	Tendering:		
Total annual estimated support in the electricity sector (in ktoe)		1,839.01	1,665.32
Total annual estimated support in the heating sector (in ktoe)		5,460.3	5,405.8
Total annual estimated support in the transport sector (in ktoe)		687.28	1,000.72
* The quantity of energy supported by the per unit support gives an indication of the effectiveness of the support for each type of technology			
** For the purposes of calculating prices in EUR a rate of €1=PLN 4.2693 was used in accordance with the Regulation of the Prime Minister of 18 December 2019 on the average zloty-to-euro exchange rate serving as the basis for calculating the value of public contracts (Journal of Laws, item 2453).			

1) Using data from the President of the Energy Regulatory Office concerning the electrical energy produced in 2017 and 2018, for which certificates of origin were issued.

2) In Poland, 100% of electrical energy or heat from RES is covered by obligatory take up.

3) The price given is the price received by RES for electrical energy produced and fed into the grid, which is based on the average electricity sales price on the competitive market (reports of the President of the Energy Regulatory Office No 28/2018 and 20/2019).

4) The value given is the average value of certificates of origin in 2017 and 2018, calculated on the basis of Polish Power Exchange data.

5) In Poland all RES electrical energy is exempt from excise duty based on documents confirming the redemption of the certificate of origin within the meaning of energy legislation. Until the end of 2018, the applicable excise rate for electrical energy was PLN 20/MWh.

6) No level of direct support was determined in advance for specific technologies; individual projects may apply for support independently and without restrictions. There is a competition procedure for most programmes, additional explanations from the National Fund for Environmental Protection and Water Management have been provided below the table.

7) Feed-in tariff and feed-in premium systems are dedicated to biogas plants and hydropower plants. These were introduced in Poland during the second half of 2018.

Source: Study by the Ministry of Climate based on data provided by the NREAP, URE, Statistics Poland, Zarządca Rozliczeń S.A. and national legislation.

As the key institution for the funding of environmental protection in Poland, the National Fund for Environmental Protection and Water Management provides financial assistance for the promotion and development of RES technologies and RES education.

This is implemented by means of:

- the National Fund for Environmental Protection and Water Management ‘priority schemes’ utilising the Fund’s own resources;
- Green Investment Scheme programmes, for which the National Fund for Environmental Protection and Water Management is the national operator;
- EEA Norwegian Financial Mechanism projects, for which the National Fund for Environmental Protection and Water Management is the institution supporting the programme operator (the Ministry of the Environment);

- Measures and sub-measures of priority axis I of the Operational Programme Infrastructure and Environment 2014-2020 for which the National Fund for Environmental Protection and Water Management, the Provincial Fund for Environmental Protection and Water Management in Katowice and the Minister for State Assets have been appointed the Implementing Body (IB).

2017:

1. Programmes, the main objective of which was to support investment in RES:
 - a. 'SYSTEM' priority scheme - support for environmental protection and water management measures implemented by external partners, part 3) Prosument [prosumer] - funding line for the purchase and assembly of RES microinstallations - PLN 42,568,000 in loans and PLN 27,404,000 in subsidies have been paid out;
 - b. Priority scheme 'Improvement of air quality', part 1) Bocian [stork] - dispersed RES - loans worth PLN 6,284,000 have been paid out;
 - c. Priority scheme 'Green Investment Scheme', part 4) Construction, extension and reconstruction of grids in order to enable the connection of wind power generation sources (RES) – subsidies amounting to PLN 2,766,000 have been paid out;
 - d. Priority scheme 'Support for dispersed RES. Programme for investments in RES and high efficiency co-generation plants' - PLN 2,500,000 in loans paid out;
 - e. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.1.1 Support for investment involving electricity generation from renewable sources and connecting such sources to the distribution/transmission network. - PLN 9,058,000 in EU subsidies have been paid out²⁷;
 - f. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.1.2 Support for projects involving grid construction and reconstruction to enable the connection of units generating energy from RES - PLN 9,006,000 in EU subsidies have been paid out²⁸.
2. Programmes, which included the objective of supporting investment in RES:
 - a. Priority scheme 'Improvement of air quality', part 1) Reduction of energy consumption in the construction industry - PLN 565,000 in subsidies have been paid out;
 - b. Priority scheme 'Improvement of air quality'. Part 4) LEMUR - Energy Efficient Public Facilities - PLN 15,380,000 in loans and PLN 408,000 in subsidies have been paid out;
 - c. Priority scheme 'Improving energy efficiency' - Subsidised loans for constructing energy efficient houses - PLN 1,861,000 in subsidies have been paid out;
 - d. 'Green Investment Scheme', part 1) Energy management in public facilities - PLN 10,591,000 in subsidies and PLN 5,005,000 in loans have been paid out;

²⁷ National Fund for Environmental Protection and Water Management, Report on the activities of the National Fund for Environmental Protection and Water Management in 2017, Annex to Resolution No 61/18 of the National Fund for Environmental Protection and Water Management Supervisory Board of 28 April 2018, Warsaw 2018, p. 27.

²⁸ Ministry of Climate own data.

- e. ‘Green Investment Scheme’, part 5) Energy management in buildings of selected entities from the public finance sector – PLN 208,000 in subsidies have been paid out;
- f. ‘SYSTEM’ Priority scheme - support for environmental protection and water management measures implemented by external partners, part 4) KAWKA– elimination of near-ground emissions to help increase energy efficiency and the development of dispersed RES – PLN 46,996,000 in subsidies have been paid out;
- g. Operational Programme PL04 ‘Saving energy and promoting renewable energy sources’ - PLN 3,665,000 in subsidies have been paid out from the State budget and PLN 203,514,000 in subsidies from foreign funds;
- h. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.3.1 Supporting energy efficiency in public buildings - PLN 30,848,000 in EU subsidies have been paid out²⁹.
- i. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.6.1 High efficiency co-generation sources - PLN 17,899,000 in EU subsidies have been paid out³⁰;
- j. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.6.2 Heating and cooling networks for high efficiency co-generation sources - PLN 17,900,000 in EU subsidies have been paid out³¹;
- k. Priority scheme ‘Geology and Mining’. Part 1) Learning about Poland’s geology and management of mineral deposits and groundwater resources.

2018:

1. Programmes, the main objective of which was support of investment into RES:
 - a. ‘SYSTEM’ Priority scheme - support for environmental protection and water management measures implemented by external partners, part 3) Prosumpt [prosumer] - funding line for the purchase and assembly of RES microinstallations - loans worth PLN 26,850,000 and subsidies worth PLN 12,471,000 have been paid out;
 - b. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.1.1 Support for investment involving electricity generation from renewable sources and connecting such sources to the distribution/transmission network. - PLN 27,203,000 in EU subsidies have been paid out³²;
 - c. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.1.2 Support for projects involving grid construction and reconstruction to enable the connection of units generating energy from RES - PLN 17,444,000 in EU subsidies have been paid out³³.

²⁹National Fund for Environmental Protection and Water Management, Report on the activities of the National Fund for Environmental Protection and Water Management in 2017, Annex to Resolution No 61/18 of the National Fund for Environmental Protection and Water Management Supervisory Board of 28 April 2018, Warsaw 2018, p. 27.

³⁰Ibid.

³¹Ibid.

³²National Fund for Environmental Protection and Water Management, Report on the activities of the National Fund for Environmental Protection and Water Management in 2018, Annex to Resolution No 77/2019 of the National Fund for Environmental Protection and Water Management Supervisory Board of 18 April 2019, Warsaw 2019, p. 29.

³³ Ministry of Climate own data.

2. Programmes, which included the objective of supporting investment in RES:
- a. Priority scheme ‘Improvement of air quality’, part 2) Reduction of energy consumption in the construction industry - PLN 13,182,000 in subsidies and PLN 8,000 in loans have been paid out;
 - b. Priority scheme ‘Improvement of air quality’, part 4) LEMUR - Energy Efficient Public Facilities - PLN 4 468 000 in loans and PLN 95,000 in subsidies have been paid out;
 - c. Priority scheme ‘Improving energy efficiency’ - Subsidised loans for constructing energy efficient houses - PLN 1,070,000 in subsidies have been paid out;
 - d. ‘Green Investment Scheme’, part 1) Energy management in public facilities - PLN 4,565,000 in subsidies and PLN 5,432,000 in loans have been paid out;
 - e. ‘Improvement of air quality’ scheme, part 5) Public facilities with improved energy efficiency standard – PLN 1,096,000 in subsidies and PLN 561,000 in loans have been paid out;
 - f. Priority scheme ‘SYSTEM’ - support for environmental protection and water management measures implemented by external partners, part 4) KAWKA– elimination of near-ground emissions to help increase energy efficiency and the development of dispersed RES – PLN 41,125,000 in subsidies have been paid out;
 - g. Support for projects related to a low-emission and resource-efficient economy. Part 2) Co-financing of projects under OP I & E 2014-2020 priority axis I - Low-emission economy - PLN 32,484,000 in loans paid out;
 - h. OP I & E 2014-2020 priority axis I Low-emission economy Measure 1.2 promoting energy efficiency and the use of renewable energy sources - PLN 296,000 in EU subsidies have been paid³⁴;
 - i. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.3.1 Supporting energy efficiency in public buildings - PLN 64 253 000 of EU subsidies have been paid out³⁵;
 - j. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.3.2 Supporting energy efficiency in the residential sector - PLN 3,724,000 in EU subsidies have been paid out³⁶;
 - k. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.6.1 High efficiency co-generation sources - PLN 31,041,000 in EU subsidies have been paid out³⁷;

³⁴National Fund for Environmental Protection and Water Management, Report on the activities of the National Fund for Environmental Protection and Water Management in 2018, Annex to Resolution No 77/2019 of the National Fund for Environmental Protection and Water Management Supervisory Board of 18 April 2019, Warsaw 2019, p. 29.

³⁵Ibid.

³⁶Ibid.

³⁷Ibid.

- l. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.6.2 Heating and cooling networks for high efficiency co-generation sources - PLN 57 263 000 of EU subsidies have been paid out³⁸;
- m. OP I & E 2014-2020 priority axis I Low-emission economy Sub-measure 1.7.1 Supporting energy efficiency in residential facilities in the Śląskie Province - PLN 7,895,000 in EU funds have been paid out³⁹;
- n. Priority scheme ‘Geology and Mining’. Part 1) Learning about Poland’s geology and management of mineral deposits and groundwater resources.

The National Fund is a beneficiary of sub-measure 1.3.3 ‘National advisory support scheme for the public, residential and entrepreneurial sector with regard to energy efficiency and RES’. The National Fund for Environmental Protection and Water Management is the lead partner of the project, cooperating with 16 partners, i.e. 15 Provincial Funds for Environmental Protection and Water Management and the Marshal’s Office in Lublin. Since 2015, the project has been operating across the whole country based on a network of Professional Energy Advisors [*Profesjonalni Doradcy Energetyczni*, PDE].

Interest in the project has remained high. Between 1 January 2017 and the end of 2018, the PDE supported the preparation of around 340 Low Emission Plans by verifying their provisions. During that same period, more than 19,000 individual consultations were held and advice was provided on more than 15,000 occasions under the project. These measures helped support the preparation of more than 960 modern energy efficiency and RES investments benefitting the environment. In total, advisory services were provided on almost 39,000 occasions.

In 2017-2018, almost 120 conferences in the ‘Energy efficiency and RES - funding offer and advisory support’ series were organised as part of the information and promotion activities, reaching more than 16,000 persons across Poland. There were also other periodically organised events under the project, allowing all interested persons to obtain information about the benefits of investments related to energy efficiency and RES. These included: European Funds Open Days, Pomeranian Energy Days in Gdańsk, training conferences during the international POL ECO SYSTEM fair in Poznań, training conferences during the National Economic Summit in Siedlce. Relevant information was also circulated via: press publications, brochures and information leaflets, online publications (including in social media), active participation by Energy Advisors in a number of mass events.

Since the EU promotes a policy of sustainable development based on the assumption that climate neutrality should go hand in hand with rising employment and social inclusion, we would also present the employment figures for the individual RES sectors in Poland. Based on data from 2017, ‘The state of renewable energies in Europe. Edition 2018. 18th EurObserv’ER Report’ gives the following employment figures for RES in Poland (figures indicate the number of persons employed in establishments of the given category):

- wind energy - 8000,

³⁸Ibid.

³⁹ 2018 Implementation Report for the Operational Programme Infrastructure and Environment 2014-2020.

- photovoltaics - 1100,
- thermal solar energy – 300,
- hydropower – 1100,
- geothermal energy - 100,
- heat pumps – 3000,
- biogas – 2300,
- biofuels – 31 400,
- renewable municipal waste – 700,
- biomass – 25 900.

The above data may serve not only as an indicator of growth in the individual RES sectors, but also as one of the main indicators of the implementation of sustainable development. Data concerning the increase in employment also help assess the growth of these sectors and therefore also the demand for specific qualifications in the near future.

In 2017, on the recommendation of the Ministry of the Environment and in the context of the ‘Clean Air’ scheme adopted by the Cabinet on 17 January 2017, a start was made on the provision of training for social workers from Social Assistance Centres (OPS). Training covered areas such as improving air quality, thermal modernisation, RES in the residential sector, correct use of flats and houses, rational use of thermal energy and funding opportunities for natural persons with regard to projects related to EE and RES. In 2017, a series of 16 pilot training modules was organised, involving 338 OSP social workers. In 2018, a series of 121 training modules was organised for more than 2800 OSP social workers. In total, 137 training sessions for 3140 persons were organised in the context of the activities from the start of the cooperation until 31 December 2018. Due to demand, a decision was taken to continue offering training in 2019.

In 2018, Energy Advisors also began to offer training for candidate Municipal Energy Officers. Training comprises three areas, including information on RES, totalling 6 days of training culminating in an examination. 6 training sessions for more than 126 persons were organised up to the end of 2018. Training continued to be offered in 2019.

Under the project, funds are transferred to the project partners to refund the costs incurred in implementing it. More than PLN 20.6 million was refunded in 2017-2018.

The National Fund for Environmental Protection and Water Management also carried out activities to raise public awareness with regard to renewable energy sources under the ‘Environmental Education’ priority scheme. In 2017, PLN 527,211.77 in subsidies provided by the National Fund for Environmental Protection and Water Management contributed to 8 education initiatives directly or indirectly related to RES. In 2018 there were two such initiatives, without funding from the National Fund for Environmental Protection and Water Management (funding provided in 2019.)

In order to support and promote RES the National Fund for Environmental Protection and Water Management implemented the following initiatives:

Conferences, meetings and workshops organised by the National Fund for Environmental Protection and Water Management

- Press conference by the Board of the National Fund for Environmental Protection and Water Management ‘Geothermal energy as a priority of the National Fund for Environmental Protection and Water Management’, held in Zakopane on 21 March 2017.
- Conference ‘Environmental protection challenges in energy and heating’ held on 3 April 2017.
- Press conference ‘The National Fund for Environmental Protection and Water Management supports the development of geothermal energy in Poland - 5 new grant agreements signed for PLN 107 million’, held on 26 September 2017.
- Conference ‘Heating systems cooperating with RES and thermal storage facilities’ held on 17 January 2018.
- Workshop seminar ‘Effective heating systems - heat from RES’ held on 31 August 2018.
- Press conference organised jointly with a study trip for journalists under Axis I of the Operational Programme Infrastructure and Environment 2014-2020 ‘Geothermal energy - clean energy from inside the Earth. Support from the National Fund for Environmental Protection and Water Management for local governments and the environment’ (Warsaw, 11 September 2018).
- National conference on Axis I of the Operational Programme Infrastructure and Environment 2014-2020, for which the National Fund for Environmental Protection and Water Management is the implementing body, held on 24 September 2018 at the Marriott Hotel in Warsaw.
- Training workshops Covenant of Mayors under the project ‘National advisory system for the public sector, residential sector and business sector on energy efficiency and RES’ organised on 16 October 2018.
- Meeting concerning participation in the ‘Heat from RES’ pilot programme on the modernisation of heating systems working with RES and thermal storage facilities on 18 October 2018.
- Training for applicants and beneficiaries of national RES programmes.
- Training for applicants and beneficiaries of Axis I of the Operational Programme Infrastructure and Environment 2014-2020.
- Conferences and training organised under the Energy Advice Project.

Implementation of RES-related activities under the Operational Programme Infrastructure and Environment 2014-2020 (as of 31 December 2018)

Activities to increase the use of energy from renewable sources are implemented under priority axis I ‘Low-emission economy’ of the Operational Programme Infrastructure and Environment, in particular under measure 1.1 *support for generation and distribution of electricity from renewable energy sources*.

This is further subdivided into two sub-measures:

1.1.1 Support for investment involving electricity generation from renewable sources and connecting such sources to the distribution/transmission network (for which the National Fund for Environmental Protection and Water Management is the implementing body).

1.1.2 Support for projects involving grid construction and reconstruction to enable the connection of units generating energy from RES, for which the implementing body is the Ministry of Climate (previously the Ministry of Energy and the Ministry of State Assets).

Sub-measure 1.1.1. is aimed at investment projects related to: the construction or reconstruction of generation units increasing electricity generation from renewable sources and connecting such sources to the distribution/transmission network. Connecting to an electricity grid or heat grid that belongs to the project's beneficiary (energy producer) can be an element of the project.

The types of RES projects are based on the National Action Plan for RES. Support covers construction or reconstruction of generation units utilising wind energy (over 5 MWe), biomass (over 5 MWth/MWe), biogas (over 1 MWe), hydropower (over 5 MWe), solar energy (over 2 MWe/MWth) and geothermal energy (over 2 MWth). Support for RES units using hydroelectric energy will be possible for existing dam installations where it is possible to deploy hydroelectric plants while maintaining the morphological continuity of the watercourse by ensuring that the installation is fully penetrable for the displacement of water fauna. The sub-measure will contribute to meeting the requirements arising from the EU Climate and Energy Package and the Europe 2020 strategy. The sub-measure will directly enable the requirements of Directive 2009/28/EC to be met.

Support under sub-measure 1.1.2 is aimed at projects concerning the construction or reconstruction of electrical grids to increase the capacity of electricity infrastructure permitting the connection of new RES generation capacity to the electricity grid of the transmission system operator or to the electricity grid of distribution systems operators with a voltage of 110 kV. The sub-measure will also eliminate a significant barrier to the development of renewable energy, i.e. the lack of sufficiently developed network infrastructure permitting the uptake of energy from areas where RES electricity generating units are built. Sub-measure 1.1.2. will also impact on regional development, in particular by implementing environmental objectives (improved air quality), creating jobs and optimising the use of local renewable energy resources.

Support under these measures is available to renewable energy producers (sub-measure 1.1.1), as well as to the Transmission System Operator and distribution system operators (sub-measure 1.1.2).

EUR 360 million is available for measure 1.1., including EUR 150 million earmarked for investments related to producing energy from renewable sources.

Support under sub-measure 1.1.1 is offered through competitions and granted pursuant to the Regulation of the Minister for the Economy of 23 November 2016 awarding State aid for investment projects involving the construction or reconstruction of units generating power from RES under the 2014-2020 Infrastructure and Environment Operational Programme (Journal of Laws item 1941). The first competition under sub-measure 1.1.1 was announced in

December 2016, with selection starting in 2017. 14 support agreements under this measure were signed up to the end of 2018, totalling PLN 157,886,415.28 (EU contribution).

Support under sub-measure 1.1.2 is implemented without competition procedures. Projects eligible for support should result from the List of Strategic Projects for energy infrastructure within the framework of the 2014-2020 Infrastructure and Environment Operational Programme, which is the Project pipeline for the energy sector under of the 2014-2020 Infrastructure and Environment Operational Programme. The first version of this document was drawn up in 2015 and version 3.1 (which is applicable for this report) was drawn up in October 2018. By the end of 2018 there were 16 grant agreements under sub-measure 1.1.2 for a total of PLN 825,857,135.33 (in 2017-2018 there were 11 grant agreements for PLN 768,443,179.29). Support is offered pursuant to the Regulation of the Minister of the Economy of 23 October 2015 awarding State aid for investment projects involving the construction or reconstruction energy infrastructure under the 2014-2020 Infrastructure and Environment Operational Programme (Journal of Laws item 1803, as amended), as well as Commission decisions issued following the notification of individual aid awards compatible with the internal market pursuant to Article 107(3)(c) TFEU.

Allocation of funds under national and regional schemes for the period 2014-2020

11 thematic objectives were adopted under the Partnership Agreement passed by the Commission on 23 May 2014 specifying the lines of intervention for EU policies in Poland in 2014-2020. This includes thematic objective No 4: *‘Supporting the shift towards a low-carbon economy in all sectors’*, consisting of 6 priorities:

4.1 – *promoting the production and distribution of energy derived from renewable sources,*

4.2 – *promoting energy efficiency and renewable energy use in enterprises,*

4.3 – *supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector,*

4.4 – *developing and implementing smart distribution systems at low and medium voltage levels,*

4.5 – *promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures,*

4.6 – *promoting the use of high-efficiency co-generation of heat and power based on useful heat demand,*

which should contribute to a dynamic and harmonious increase in the use of RES in Poland. Detailed allocation of EU funds under the individual operational programmes is shown in overview 2.

**Overview 3. Allocation of funds under national and regional schemes
for the period 2014-2020 under RES investment priorities (4.1.-4.3) [EUR]**

Thematic objective		Investment priority			
		4.1. Promoting the production and distribution of energy derived from renewable sources	4.2. Promoting energy efficiency and renewable energy use in enterprises	4.3. Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure including public buildings and in the housing sector	TOTAL
Programme	OP Infrastructure and Environment	360,000,000	90,322,921	516,543,650	966,866,571
	Dolnośląskie Regional Operational Programme	55,608,280	32,405,520	179,638,903	267,652,703
	Kujawsko-Pomorskie Regional Operational Programme	30,718,118	38,397,646	100,443,720	169,559,484
	Lubelskie Regional Operational Programme	180,698,971	45,787,659	129,891,734	356,378,364
	Lubuskie Regional Operational Programme	17,301,052		50,969,472	68,270,524
	Łódzkie Regional Operational Programme	54,578,417		124,529,817	179,108,234
	Małopolskie Regional Operational Programme	60,072,921	19,000,000	96,131,839	175,204,760
	Mazowieckie Regional Operational Programme	56,375,309		109,541,043	165,916,352
	Opolskie Regional Operational Programme	10,400,000	10,000,000	27,037,833	47,437,833
	Podkarpackie Regional Operational Programme	109,993,244		87,323,162	197,316,406
	Podlaskie Regional Operational Programme	70,000,000	15,530,000	52,250,000	137,780,000
	Pomorskie Regional Operational Programme	42,990,200		139,718,151	182,708,351
	Śląskie Regional Operational Programme	62,913,372	33,000,000	234,672,997	330,586,369
	Świętokrzyskie Regional Operational Programme	34,086,206	20,453,874	72,871,262	127,411,342
	Warmińsko-Mazurskie Regional Operational Programme	98,812,136	20,000,000	80,942,239	199,754,375
	Wielkopolskie Regional Operational Programme	30,200,000		101,000,000	131,200,000
	Zachodniopomorskie Regional Operational Programme	57,135,000		50,576,416	107,711,416
TOTAL	1,331,883,226	324,897,620	2,154,082,238	3,810,863,084	

Source: Ministry of Funds and Regional Policy

3.1. 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)

Pursuant to Article 5(6a) of the Energy Act, electricity sellers must inform their consumers about the structure of the fuels used or other energy carriers used to produce the electrical energy sold by them in the preceding calendar year. They must also explain how to access information on the environmental impact of producing this energy, at least with regard to carbon dioxide emissions and radioactive waste. Article 5(6b) states that in the case of electrical energy purchased on a commodity exchange or imported from the electricity systems of countries that are not EU Member States, information concerning the structure of the fuels used or other energy

carriers used to produce electrical energy may be drawn up on the basis of collective data concerning the share of the individual kinds of electrical energy sources used to produce this energy in the preceding calendar year.

In Poland, all electrical energy from renewable sources that is covered by the national support mechanism is included in the volume of energy delivered to final customers. The share of electrical energy from renewable energy sources in the electrical energy volume delivered to final customers in 2017-2018 was 13.09% and 13.03%, respectively (according to Statistics Poland).

4. Information on how support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(c) of Directive 2009/28/EC)

Information on RES support schemes that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material that was included in the 2015-2016 report concerning the progress in the promotion and use of renewable energy sources in Poland remains up-to-date.

With regard to the use of biocomponents made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material it should be noted that applicable provisions have been included in the Biocomponents and Liquid Biofuels Act. Pursuant to Article 23(4a) and (4b) of the Biocomponents and Liquid Biofuels Act, the share of biocomponents made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material calculated on the basis of the calorific value is deemed to be two times higher in the general volume of liquid fuels and liquid biofuels sold or otherwise disposed of in Poland by operators implementing the NIT (all operators, including operators having a seat or place of residence outside Poland, performing economic activity involving production, import or intra-Community acquisition of liquid fuels or liquid biofuels, operators selling or otherwise disposing of liquid fuels or biofuels in Poland or using them for their own needs in Poland) or used by these operators for their own needs in Poland.

Waste that is food-based raw material and which owing to accidental or intentional activity or inappropriate conditions of production, storage, transport or processing have acquired characteristics making them unfit for consumption or no longer meet the requirements for consumption, and cellulosic and ligno-cellulosic materials made of high quality wood, are not considered feedstocks whose share calculated on the basis of the calorific value is deemed to be twice as high within the meaning of Article 23(4a) of the Biocomponents and Liquid Biofuels Act.

5. Information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system (Article 22(1)(d) of Directive 2009/28/EC)

In 2017-2018, a system of guarantees of origin for electricity produced from renewable energy sources in renewable energy installations was in operation, having been introduced into

the Polish legal order in 2013. Since 2015, this system has been operating on the basis of rules governed by Chapter V of the Renewable Energy Act.

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

Table 4 contains information on biomass supplies for energy purposes in Poland. Currently, it is impossible to fill in this table in full for 2017 and 2018, owing to the lack of detailed data on indirect supply.

Furthermore, reporting rules concerning supplies of energy crops used to produce biocomponents that were applicable in 2017-2018 do not make it possible for the quantity and type of feedstocks to be precisely determined, specifying:

- feedstocks imported from other EU Member States,
- feedstocks imported from third countries.

Given the above, overview 3 and overview 4 provide supplementary information on the quantity and kind of feedstocks used to produce the individual biocomponent types.

Pursuant to the Renewable Energy Act, energy companies performing economic activity involving the production of agricultural biogas or electrical energy from agricultural biogas are obliged to submit quarterly reports to the Director-General of the KOWR within 45 days of the end of the quarter, stating the following information:

- the volume and type of all substrates used to produce agricultural biogas or to produce electrical energy from biogas,
- the total volume of agricultural gas produced, indicating the volume of agricultural biogas fed into the gas distribution grid, of gas used to produce electricity in a separate or co-generation unit or used otherwise,
- the total volume of electricity produced from agricultural biogas in a separate or co-generation unit,
- the volume of electricity sold (including electricity sold to obliged vendors), produced from agricultural biogas and fed into the distribution grid.

Agricultural biogas production in Poland uses mostly agricultural by-products and residues from the agro-food industry (80% of all feedstocks), which do not compete with the food market, in particular with regard to the use of agricultural land. The relevant information is presented in overview 5.

Table 4a shows the current domestic agricultural land use for production of crops dedicated to energy production (in ha). Information on the surface area used for the cultivation of short rotation coppices (birch trees, willow trees, poplar trees) is managed by the Agency for Restructuring and Modernisation of Agriculture [*Agencja Restrukturyzacji i Modernizacji Rolnictwa, ARiMR*].

Table 4:
Biomass supply for energy use

	Amount of domestic raw material (*)		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU(*)		Primary energy in amount of imported raw material from non EU (ktoe)	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	21,143,315	21,135,223	4,797	4,796	215,701	229,419	49	52	1,528,619	2,078,059	347	472
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	-	-	-	-	-	-	-	-	-	-	-	-
Agricultural by-products / processed residues and fishery by-products **	890,688	618,995	283	196	-	-	-	-	-	-	-	-
Biomass from waste (municipal, industrial etc.) **	3,382,541	3,327,137	905	845	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short rotation trees (please specify)	134,550	186,877	29	43	-	-	-	-	-	-	-	-
Other sold waste organic fractions	305,764	309,270	92	98	-	-	-	-	-	-	-	-
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)	Data on the use of energy feedstocks used for transport have been provided in overview 4 and overview 5.											
Energy crops (grasses etc.) and short rotation trees for biofuels	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-

* Amount of raw material if possible in m3 for biomass from forestry and in tonnes for biomass from agriculture and fishery and biomass from waste

** The definition of this biomass category should be understood in line with table 7 of part 4.6.1 of Commission Decision C (2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC

Source: Statistics Poland

Overview 4. Basic feedstocks of agricultural origin and products of feedstock processing used for production of esters (in tonnes)

Feedstock type	Year 2017	Year 2018
Rapeseed oil	896,402,196	861,030,321
Soya oil	-	-
Fatty acids	512,300	537,460
Rapeseed	-	-
Animal fats	-	-
Biomass oil	-	-
Used frying grease oil	-	-
Used cooking oil	3,850,840	22,520,654
Rendered animal fat 2	1,415,050	2,119,911
Vegetable oil	-	-
Palm olein	-	511,870
methyl esters that do not meet the quality criteria for biocomponents	-	96,640
TOTAL	902,180.386	886,816.856

Source: National Agriculture Support Centre (KOWR)

Overview 5. Basic feedstocks of agricultural origin and products of feedstock processing used for production of bioethanol (in tonnes)

Feedstock type	Year 2017	Year 2018
Maize	427,313.762	447,394.576
Distillate of agricultural origin	38,835.309	23,789.098
Residual fractions from alcohol rectification	6,829.325	6,729.839
Molasses	23,112.433	32,866.479
Potatoes	-	-
Rye	-	-
Sugar syrup	-	-
Alcohol slops	-	-
Rectified alcohol	-	-
Spelt	-	-
Bran	-	-
Sugar	-	-
Dehydrated alcohol	-	-
Food waste	3,645.045	8,331.331
Starch slurry	330,482.048	157,374.462
Suspension of waste starch (waste code 02 03 80) (richly hydrated solution)	-	167,125.610
Waste and residue distillate	-	4,127.8844
TOTAL	830,217.922	847,739.279

Source: KOWR

Overview 6. Declared production capacity of biocomponent producers (as of 31 December of the year concerned) (in thousand tonnes)

Biocomponent type	Year 2017	Year 2018
Esters	1,356.438	1,356.438
Bioethanol	667.897	707.575
Liquid biohydrocarbons	25.123	25.123

Source: KOWR

Overview 7. Biocomponent production volumes (in thousand tonnes)

Biocomponent type	Year 2017	Year 2018
Esters	896.957	883.264
Bioethanol	203.652	203.886

Source: KOWR

Overview 8. Feedstocks used to produce agricultural biogas (in tonnes)

Feedstock type	Year 2017	Year 2018
Slurry	807,223.458	757,554.750
Fruit and vegetable waste	756,929.171	770,952.822
Distilling dregs	762,295.604	839,983.121
Maize silage	472,151.990	482,426.716
Sugar beet pulp	280,208.757	291,648.405
Technological sludge from the agri-food industry	158,174.085	179,800.761
Waste from the dairy industry	75,977.311	107,972.444
Manure	82,703.208	85,422.018
Green fodder	96,090.469	40,715.342
Plant-tissue waste	24,223.322	54,656.930
Food processing waste	32,563.751	66,345.423
Stale food	35,250.440	73,620.296
Fruit and vegetables	46,013.022	38,397.139
Bird manure	21,083.680	22,524.870
Gastric contents	24,477.218	18,387.455
Fat residues	11,810.940	5,171.160
Cereals, cereal waste	21,316.685	13,137.147
Post-slaughter waste	15,379.995	66,827.715
Grass and cereals silage	25,141.426	25,418.990
Straw	11,584.860	6,849.060
Digestate	-	-
Feed	7,178.196	12,879.019
Fat	7,116.893	11,909.360
Protein and fat waste	4,400.360	3,590.090
Catering reflux [catering recycling]	4,184.054	4,919.539
Liquid wheat waste	1,368.500	1,435.842
Yeast residues	3,898.780	865.410
Backwash water	1,043.680	150.360
Vegetable oil production waste	1,475.639	615.920
Protein and fat sludge	-	-
Glycerol	484.009	356.670
Fusel oils	234.280	140.460
Extraction marcs from the production of herb pharmaceuticals	68.140	39.920
Vegetable oils	78.299	204.330
Residues from the processing of vegetable oils	1,494.080	13,046.020
Coffee	3,305.450	2,223.660
Lecithin and soap blend	-	40,040
TOTAL	3,796,929.752	4,000,229.204

Source: KOWR

The report has been extended to include information concerning the installed capacity of agricultural biogas plants, the volume of agricultural biogas produced and electrical energy produced from agricultural biogas.

Overview 9. Total installed electrical capacity of agricultural biogas plants [MWe], (as of 31 December of the year concerned).

Year 2017	Year 2018
101.093	101.767

Source: KOWR

Overview 10. Production data of agricultural biogas plants.

Production data	Year 2017	Year 2018
Volume of agricultural biogas produced [in mln m3]	291.742	303.609
Volume of electrical energy produced from agricultural biogas [in GWh]	608.270	638.510

Source: KOWR

By using agricultural feedstocks for the production of biocomponents used in liquid fuels and liquid biofuels, and for the production of biogas and heat, this may result in more agricultural land being used for the production of biomass for energy purposes.

In the case of crops such as rapeseed and cereals used to produce biocomponents used in transport fuels, by-products are widely used to produce animal feed. With regard to the use of rapeseed for biofuel production it should be noted that rapeseed meal accounts for around 60% of the mass of rapeseed seeds.

This means that a considerable proportion of land is in fact used for livestock production rather than for the production of biofuels only. Thus, the development of the biofuel (biocomponent) sector in Poland increases the potential to obtain valuable protein components, such as rapeseed meal and dried distillers grains with solubles.

Table 4a:
Current domestic agricultural land use for production of crops dedicated to energy production (ha)

Land used			Surface area (ha)	
Point	Crop type	Crop	Year 2017	Year 2018
1. Land used for crops	Food crops	Rapeseed	762.7	824.9
		Maize	85.2	99.8
2. Land used for short rotation trees	Short rotation coppices	Birch trees, poplar trees, willow trees, other coppices	22.4	20.1
3. Land used for other energy crops	Grasses	Giant miscanthus	1.3	0.8
		Other grasses	10.1	7.2
Total			881.7	952.8

Source: Ministry of Agriculture and Rural Development estimate based on data from KOWR, Statistics Poland and the Agency for Restructuring and Modernisation of Agriculture.

7. Information on any changes in commodity prices and land use within Poland in the preceding two years associated with increased use of biomass and other forms of energy from renewable sources (Article 22(1)(h) of Directive 2009/28/EC)

Overview 11. Agricultural area by type (in thousand hectares)

Specification	Geodesic area - agricultural land in total	Agricultural land use								Other	
		Total	In good condition					Kitchen gardens	Permanent meadows		Permanent grasslands
			Total	Sown	Fallow land	Permanent crops					
						Total	including orchards				

	thousand hectares										
Year 2017	18,810	14,620	14,490	10,757	150	384	362	28	2,796	375	130
Year 2018	18,776	14,669	14,540	10,829	180	352	331	28	2,754	395	129

Source: KOWR

Overview 12. Area corresponding to forests, agricultural land in good condition and estimated area on which energy crops are grown (in thousand hectares).

Specification	Year 2017	Year 2018
Area covered by forest, woods and bushes*	22.4	20.1
Agricultural land in good condition	14,489.1	14,539.6
Estimated area on which energy crops are grown	879.0	952.8
Share of total area of agricultural land in good agricultural condition corresponding to land used for energy purposes	6.07%	6.55 %

* concerns land subject to payment for agricultural land, does not include forest areas

** includes areas taken into account under 'areas covered by forest, woods and bushes'

Source: Ministry of Agriculture and Rural Development estimate based on data from KOWR, Statistics Poland and the Agency for Restructuring and Modernisation of Agriculture.

By analysing the area of agricultural land in good condition in 2018 it was revealed that this area had increased by 505 hectares (0.35%) to 14,539.6 hectares in comparison to 2017. The estimated area on which energy crops were grown was 952.8 thousand hectares in 2018, exceeding the sown area from 2017 by 73.8 thousand hectares, or 7.75% (overview 11).

An analysis of feedstock prices carried out in Poland indicated that there is a clear link between prices on the national market and prices of agricultural raw materials on the global market. Since in Poland the share of agricultural raw materials used for energy purposes is negligible, no significant impact was noticed on market prices due to this type of use of agricultural production.

The structure of land use in agricultural holdings has remained relatively stable according to data in overview 11, even if an increase in the area on which energy crops are grown has been observed in recent years.

Overview 13. Average purchase prices of key agricultural products (PLN/t).

Commodities	Year 2017	Year 2018
Wheat	664	726
Rye	547	597
Barley	612	680
Maize	542	619
Rapeseed	1,576	1,553
Potatoes	371	426

Source: KOWR

The data in overview 11 and overview 12 indicate that apart from rapeseed, the average price of agricultural products increased in the period covered by this report, while at the same time the area of agricultural land increased and the area covered by forest, woods and bushes, decreased.

8. Information on the development and share of biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(i) of Directive 2009/28/EC)

As we have explained in point 1, data on the quantity of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC were not compiled until 2019. This was due to the fact that the deadline for implementing Directive (EU) 2015/1513 was 10 September 2017. The Directive was transposed into Polish law by the Act of

24 November 2017 amending the Biocomponents and Liquid Biofuels Act and certain other acts, This Act entered into force on 1 January 2018.

As such, data on the volume of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC and used in Poland to meet the binding targets were first made available for the year 2018.

It should also be pointed out that prior to 2018, in Poland there was no double counting of biocomponents produced from the feedstocks referred to in Article 21(2) of Directive 2009/28/EC.

**Table 5:
Development Biofuels**

<i>Feedstock as listed in Annex IX Part A of Directive 2009/28/EC</i>	Year 2017*	Year 2018
<i>a) Algae if cultivated on land, in ponds or photobioreactors;</i>	-	-
<i>b) Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under point (a) of Article 11(2) of Directive 2008/98/EC</i>	-	-
<i>c) Biowaste as defined in Article 3(4) of Directive 2008/98/EC from private households subject to separate collection as defined in Article 3(11) of that Directive</i>	-	-
<i>d) Biomass fraction of industrial waste not fit for use in the food or feed chain, including material from retail and wholesale and the agro-food and fish and aquaculture industry, and excluding feedstocks listed in part B of this Annex;</i>	-	175,547.033
<i>e) Straw</i>	-	-
<i>f) Animal manure and sewage sludge;</i>	-	-
<i>g) Palm oil mill effluent and empty palm fruit bunches;</i>	-	-
<i>h) Tall oil</i>	-	-
<i>i) Crude glycerine</i>	-	-
<i>j) Bagasse;</i>	-	-
<i>k) Grape marcs and wine lees</i>	-	-
<i>l) Nut shells</i>	-	-
<i>m) Husks</i>	-	-
<i>n) Cobs cleaned of kernels of corn</i>	-	-
<i>o) Biomass fraction of wastes and residues from forestry and forest-based industries, i.e. bark, branches, pre-commercial thinnings, leaves, needles, tree tops, saw dust, cutter shavings, black liquor, brown liquor, fibre sludge, lignin and tall oil</i>	-	-
<i>p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2.</i>	-	-
<i>q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs.</i>	-	-
<i>Feedstock as listed in Annex IX Part B of Directive 2009/28/EC</i>	Year 2017*	Year 2018
<i>a) Used cooking oil</i>	-	22,203.160
<i>b) Animal fats classified as categories 1 and 2 in accordance with Regulation (EC) No 1069/2009 of the European Parliament and of the Council</i>	-	2,119.911

* the mechanism for double counting of biocomponents produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC for implementing the National Indicative Target was applied in Poland for this first time in 2018.

Source: KOWR

9. Information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality in Poland during the preceding two years and information on how these impacts were assessed, with references to relevant documentation on these impacts in Poland (Article 22(1)(j) of Directive 2009/28/EC).

In order to carry out the aforementioned estimates, an analysis was performed to measure the impact of the production of biocomponents and bioliquids on water resources and the quality

of water and soil. The impact of the production of biocomponents and biofuels on water resources and the quality of water and soil in Poland was examined with regard to the following three aspects:

- the environmental impact of cultivating crops for biofuels
- the environmental impact of producing biofuels
- the environmental impact of using biofuels.

The basic crops used to produce biofuels in Poland are maize, wheat and rapeseed. According to KOWR data, in Poland the area grown with maize and wheat for bioethanol production is around 200,000 hectares, while the area grown with rapeseed for biodiesel production is around 900,000 hectares. Crops grown for biofuels do not differ in any way from food crops. Therefore, under proper conditions the environmental impact of the production of maize, wheat and rapeseed for biofuels is the same as the environmental impact of producing these plants for food purposes. However, it is necessary to take account of the current EU rules indicating the need to limit the production of biofuels from agricultural raw materials, which according to some may be in competition with plants cultivated for food purposes. In the light of the above, despite the increase in the production of biofuels in Poland in the recent years, the situation should be expected to be similar to Austria or Germany, where for a decade the production of biofuels has remained on the same level. Directive (EU) 2015/1513 supports the production of biofuels on the basis of non-food raw materials, which may originate chiefly from ligno-cellulosic material obtained from forest residues, energy crops, agricultural residues and organic municipal waste. Biofuels can also be produced from algae bred under special conditions.

As a result of these changes, in the future the current area grown with crops for the production of biofuels from food-based raw materials will be retained, alongside an increase in the share of advanced biofuels made from raw materials that are not used in the food industry.

In Poland, biofuels are produced in comparatively big production facilities, where the standards of safety and environmental protection are high. The by-products - mainly glycerol (with regard to biodiesel production) and distilling dregs (bioethanol production) are used in other industry branches. Glycerol is used to produce biogas or as a raw material for diverse pharmaceutical and cosmetics products. Distilling dregs are used to produce biogas, as well as a valuable substrate for the production of animal feed.

Biofuels are used for the propulsion of combustion engine vehicles. Burning biofuels reduces emissions of carbon monoxide, particulate matter and hydrocarbons in comparison to petroleum-derived fuels. However, biofuels emit greater volumes of nitrogen oxides than conventional fuels. Carbon dioxide emissions are independent of the type of fuel and are similar for both types of fuels. This is due to the energy balance of the thermodynamic system.

The analysis performed indicates that cultivation of crops for biofuels has no impact on the quality of soil and water resources in comparison to the traditional cultivation of these crops for food purposes. In the recent years there has been an increase in the cultivation of crops for biofuels in Poland, unlike in other Member States - such as Germany and Austria - where there has been no significant increase. However, Directive (EU) 2015/1513 imposes restrictions on the development of food crops for the production of biofuels, while at the same time creating conditions for the production of biofuels, the development of which is to be based on algae

conversion and by-products from forestry, agriculture and municipal organic waste. In Poland, the production of biocomponents has no negative environmental impact, as it is based on high safety and environmental protection standards. The use of biofuels reduces emissions of pollutants into the environment, apart from nitrogen oxides which account for a greater share of exhaust fumes.

It should also be noted that in Poland the production of biofuels and bioliquids is based mainly on the use of solid biofuels in the production of heat, production of biodiesel from vegetable fat raw materials (mainly rapeseed), production of bioethanol from raw materials containing sugar or starch (cereal grains, in particular maize), and the production of gas biofuels through methane fermentation of plant or animal biomass.

In the case of soil quality, the impact of this branch of agricultural production chiefly concerns potential changes to the balance of organic coal in the soil as a result of distortions to the organic materials cycle, as well as in the soil being potentially depleted of nutrients due to simplified crop rotation.

Biodiesel production in Poland is based mainly on the cultivation of rapeseed, which for decades has been the basic source of vegetable fat for the food industry. This means that any decrease or increase in how much of the final product (i.e. vegetable oil) is used to produce fuel at the expense of human consumption is irrelevant for the soil environment. In both cases, the straw left on the field, once incorporated, is an invaluable source of organic matter and plant nutrients (macro- and micro-nutrients).

Bioethanol production is based mainly on wheat and maize seeds, as well as potatoes in distilleries. These crops have been present in the crop rotation system for a long time and the related farming techniques are known. Therefore no risk is associated with the use of these products to produce alcohol instead of using them for food or feed. Furthermore, they have been used to produce alcohol for centuries. They are also the basis for products from the spirits industry intended for consumption. Similarly, there is no risk of the soil being potentially depleted of organic matter or nutrients due to an increase in the area occupied by cereals or maize harvested for grain, since it has been shown in numerous studies that cultivating these plants when straw is left for incorporation results in the soil being richer in these nutrients (positive nutrient balance).

Some risk may result from an increase in the share of crops intended for producing gas biofuels through methane fermentation. This is particularly relevant with regard to maize cultivated for silage, which is a substrate used in agricultural biogas plants. Maize cultivation requires comparatively intensive farming techniques and high fertilisation.

To some extent, this can be prevented if the by-product (the digestate) from the biogas plant is returned to the field as fertiliser. Since the share of maize used in agricultural biogas plants is insignificant, it is not considered a threat to biodiversity, water resources or the water or soil quality.

10. Information on the estimated net greenhouse gas emission savings due to the use of energy from renewable sources (*Article 22(1)(k) of Directive 2009/28/EC*).

The estimated reduction in greenhouse gas emissions into the atmosphere resulting from the construction of new RES sources (electricity, heating and cooling sector) is based on the methodology described in the 2009-2010 report concerning the progress in the promotion and use of renewable energy sources in Poland, as well as on the data in table 1a.

Table 6 shows the reduction in emissions of carbon dioxide into the atmosphere (in tonnes of CO₂), resulting from the increased use of renewable energy sources in Poland.

Table 6:
Estimated GHG emission savings from the use of renewable energy (t CO₂eq)

Environmental aspects	Year 2017	Year 2018
<i>Total estimated net GHG emission saving from using renewable energy⁴⁰</i>	38,125,946	39,408,221
- estimated net GHG saving from the use of renewable electricity	15,389,748	15,546,564
- estimated net GHG saving from the use of renewable energy in heating and cooling	20,324,853	20,350,605
- estimated net GHG saving from the use of renewable energy in transport	2,411,345	3,511,052

Source: Study by the National Centre for Emissions Balancing and Management (Institute of Environmental Protection - National Research Institute).

11. Information on the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, and the estimated potential for joint projects until 2020 (Article 22(1)(l) and (m) of Directive 2009/28/EC)

Table 7:
Actual and estimated excess and/or deficit (-) production of renewable energy in Poland compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries (ktoe)^{41, 42}

Actual/estimated excess or deficit production	2009 *	2010 **	2011 **	2012 **	2013 **	2014 **	2015 **	2016 **	2017 ***	2018 ***	2019 *	2020 ****
heating and cooling	-	656	847.7	1,086	982.9	567	584.4	662.7	500.9	237.0	-	-
electricity generation	-	-19	-35.7	128.6	-4.1	75.9	117.5	-3.9	-153.5	-	-	-
transport	-	-94	-83.7	-284.9	-448.6	-549.9	-527.9	-919.0	-891.7	-	-	-
TOTAL	-	543	729.3	928.7	530.2	93	174.0	-260.2	-544.3	-790.9	-	344.5

* no reference period

** data in the following documents: '2009-2010 report concerning the progress in the promotion and use of renewable energy sources in Poland', '2011-2012 report concerning the progress in the promotion and use of renewable energy sources in Poland', '2013-2014 report concerning the progress in the promotion and use of renewable energy sources in Poland' and '2015-2016 report concerning the progress in the promotion and use of renewable energy sources in Poland'.

*** calculations based on the difference between the values in table 1a (columns '2017' and '2018') of this report and the values in table 4a (columns '2017' and '2018') of the National Action Plan for RES. A positive number indicates an excess that can be potentially used for the cooperation mechanism. A negative number indicates a deficit of energy in comparison to the established trajectory.

**** calculations based on the difference between the values in table 4a NREAP (row G), and the values in table 3 NREAP (row: RES minimum trajectory [ktoe]); currently, there are no estimates allowing for a distinction to be made with regard to the RES sector.

Source: Study by the Ministry of Climate based on data provided by Statistics Poland and NREAP.

11.1. Details of statistical transfers, joint projects and joint support scheme decision rules

⁴⁰ The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

⁴¹ Please use actual figures to report on the excess production in the two years preceding submission of the report, and estimates for the following years up to 2020. In each report Member State may correct the data of the previous reports.

⁴² When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

The rules on statistical transfers have been specified in chapter VIII of the RES Act, laying down ‘*The rules governing international cooperation with regard to RES and joint investment projects*’.

Pursuant to the applicable Polish provisions, statistical transfers may take place only on the basis of an international agreement or a civil law contract concluded with the consent of the Cabinet.

Electricity undertakings interested in implementing a joint energy project in Poland or in the Polish Exclusive Economic Zone need to obtain, by way of a decision, the permission of the minister competent for energy.

12. 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).

In line with the reply submitted in the previous reporting period we would point out that the share of energy generated from RES in waste subjected to thermal processing is calculated on the basis of direct measurement, i.e. on the basis of measuring the share of biodegradable fractions contained in waste or taking into account the flat rate share of chemical energy in the biodegradable fractions contained in waste determined for certain types of waste. The share of biodegradable fractions contained in waste was assessed based on the relevant methodology specified in the harmonised standards for solid recovered fuels. The flat rate value was determined on the basis of an expert opinion commissioned for this purpose.

The Regulation of the Minister for the Environment of 8 June 2016 concerning the technical requirements for the recognition of energy recovered from thermal treatment of waste (Journal of Laws item 847) lays down both the frequency and the reference methods of testing.

13. Information on the quantity of biofuels and bioliquids in energy units (ktoe) corresponding to each category of feedstock group listed in part A of Annex VIII taken into account for the purpose of complying with the targets set out in Article 3(1) and (2), and in the first subparagraph of Article 3(4) of Directive 2009/28/EC.

As we have explained in point 1, data on the quantity of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC were not compiled until 2019. This was due to the fact that the deadline for implementing Directive (EU) 2015/1513 was 10 September 2017. The Directive was transposed into Polish law by the Act of 24 November 2017 amending the Biocomponents and Liquid Biofuels Act and certain other acts, This Act entered into force on 1 January 2018.

As such, data on the quantity of biofuels produced from the feedstocks referred to in Annex IX to Directive 2009/28/EC and used in Poland to meet the binding targets were first made available for the year 2018.

Feedstock group	Year 2017	Year 2018
Cereals and other starch-rich crops	no data	149.46
Sugars	no data	8.01
Oilseeds	no data	1,027.08

Source: ENERGY REGULATORY OFFICE