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INTRODUCTION

In accordance with Article 22 of Directive 2009/28/EC, Member States must submit to the European Commission the fifth report on progress in the promotion of the use of energy from renewable sources in 2017 and 2018. The deadline for submission of the fifth report is 31 December 2019.

In this context, the reporting obligation lies with the Ministry of Energy, as an obligation of the Member States in the context of the implementation of the Renewable Energy Directive 2009/28/EC on energy from renewable sources.

Member State reports are important for monitoring the renewable energy policy developments in the Union and the application of the requirements of Directive 2009/28/EC and of the measures of the National Renewable Energy Action Plan (NREAP) prepared in 2010.

The Union law promoting the use of energy from renewable sources has been in force since 2001, when the first Directive on the promotion and use of energy from renewable sources was adopted.

The fifth report of Romania was drawn up in accordance with the recommendations of the European Commission set out in the document entitled “Template for the Contracting Party Progress Reports under Renewable Energy Directive 2009/28/EC as adapted by the Ministerial Council Decision 2012/04/MC-EnC”. When the report was prepared, consistency was ensured with the definitions, calculation rules and terminology laid down in Directive 2009/28/EC and Regulation (EC) No 1099/2008 of the European Parliament and of the Council.

The reporting was updated by including additional provisions following Directive (EU) 2015/1513 of 9 September 2015 amending Directive 2009/28/EC. The share of energy from renewable sources in the transport sector and the overall share of RES in 2016 were revised as a result of the update. The share of RES-T has thus increased from 1.76 % to 6.17 % and the overall share of RES has increased from 24.22 % to 25.03 %.

THE PROGRESS REPORT OF ROMANIA ON THE PROMOTION AND USE OF ENERGY FROM RENEWABLE SOURCES UNDER ARTICLE 22 OF DIRECTIVE 2009/28/EC

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (2017-2018) [Article 22(1)(a) of Directive 2009/28/EC]

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

	2017	2018
RES-H&C (%)	26.58	25.43
RES-E (%)	41.97	41.79
RES-T (%)	6.56	6.34
Overall RES share (%)	24.45	23.87
Of which from cooperation mechanism (%)	0	0
Surplus for cooperation mechanism (%)	0	0

The total shares of consumption of energy from RES in the gross energy consumption in 2017 and 2018 are 24.45 % and 23.87 %, exceeding by far the shares set for the indicative trajectory of 21.83 % for the period 2017-2018, as calculated in accordance with the specifications in Directive 2009/28/EC (Annex I).

The shares in the heating and cooling sector (RES-H&C) in 2017 and 2018 are higher than the NREAP estimated trajectory values, however, the situation is not similar for the electricity and transport sectors (**Table 2**).

***Table 2*: Comparison of shares in the reporting years 2017 and 2018 with the NREAP estimated values**

	Estimation of trajectory as per NREAP		Data from the reporting years	
	2017	2018	2017	2018
RES-H&C (%)	18.07	18.86	26.58	25.43
RES-E (%)	42.57	42.63	41.97	41.79
RES-T (%)	8.80	9.23	6.56	6.34
Overall RES share (%)	21.21	21.83	24.45	23.87
Of which from cooperation mechanism (%)	0	0	0	0
Surplus for cooperation mechanism (%)	0	0	0	0

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

	2017	2018
(A) Gross final consumption of RES for heating and cooling	3 557.4	3 469.5
(B) Gross final consumption of electricity from RES	2 141.6	2 154.7
(C) Gross final consumption of energy from RES in transport	337.6	335.9
(D) Gross total consumption of energy from RES	6 036.6	5 960.1
(E) Transfer of RES to other Contracting Parties or Member States	0	0
(F) Transfer of RES from other Member States and third countries	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	6 036.6	5 960.1
Gross final consumption of energy adjusted for aviation under Article 5(6)	-	-
Share of RES in the final energy consumption %	24.45	23.87

Source: The National Statistics Institute (Institutul Național de Statistică)

As the quantity of energy consumed in the aviation sector in the period 2017-2018 accounts for 1.56 % and 0.77 % of the gross final consumption of energy, respectively, the adjustment of the final energy consumption under Article 5(6) of Directive 2009/28/EC was not necessary.

Table 1.b: **Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Romania to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity**

	2017		2018	
	MW	**GWh**	**MW**	**GWh**
Hydro	**6 691.9**	**16 405.1**	**6 700.7**	**16 663.0**
non pumped	6 328.1	16 405.1	6 341.5	16 663.0
pumped	91.5	931[1]	91.5	1 292.3[1]
mixed	272.3	-	267.6	-
Geothermal	**0.1**	**0.0**	**0.1**	**0.0**
Solar:	**1 374.2**	**1 855.7**	**1 385.9**	**1 771.0**
photovoltaic	1 374.1	1 855.7	1 385.8	1 771.0
thermal solar power	0.1	-	0.1	-
Tide, wave, ocean	-	-	-	-
Wind:	**3 029.8**	**6 590.9**	**3 032.3**	**6 639.4**
onshore	3 029.8	7 406.7[1]	3 032.3	6 322.2[1]
offshore	-	-	-	-
Biomass:	**140.5**	**525.2**	**141.4**	**437.1**
solid	118.9	458.5	119.3	367.0
biogas	21.6	66.7	22.1	70.2
bioliquids	0	0	0	0
TOTAL	**11 236.4**	**25 376.8**	**11 260.2**	**25 510.6**
of which in CHP		423.1		375.8
Gross final consumption of electricity (GWh)		60 471.4		61 039.8
RES-E share (%)	**41.97**		**41.79**	

Note: [1] Non-normalised values

Source: The National Statistics Institute (Institutul Național de Statistică)

The values of the electricity produced by hydropower plants and wind power plants are normalised values calculated in accordance with the requirements of Annex 1 to Directive 2009/28/EC.

Table 1.c: **Total actual contribution (final energy consumption) from each renewable energy technology in Romania to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)**

	2017	**2018**
Geothermal (excluding low temperature geothermal heat in heat pump applications)	32.5	31.3
Solar energy	0.7	0.7
Biomass	3 522.2	3 435.4
solid	3 512.1	3 424.2
biogas	10.1	11.2
bioliquids	0.0	0.0
Renewable energy from heat pumps: *- of which aerothermal* *- of which geothermal* *- of which hydrothermal*	0.0	0.0
Energy from municipal solid waste	2.0	2.0
TOTAL	**3 557.4**	**3 469.5**
Of which DH	14.4	15.0
Of which biomass in households	3 050.5	3 024.5
Final energy consumption for heating and cooling (ktoe)	13 383.4	13 641.5
RES-H&C share (%)	**26.58**	**25.43**

Source: The National Statistics Institute (Institutul Național de Statistică)

Table 1.d: **Total actual contribution from each renewable energy technology in Romania to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe),**

	2017	**2018**
- Bioethanol	91.07	90.44
Biodiesel (FAME)	206.16	206.63
- Hydrotreated Vegetable Oil (HVO)	-	-
- Biomethane	-	-
- Fischer-Tropsch diesel	-	-
- Bio-ETBE	-	-
- Bio-MTBE	-	-
- Bio-DME	-	-
- Bio-TAEE	-	-
Biobutanol	-	-
- Biomethanol	-	-
- Pure vegetable oil	-	-
Total sustainable biofuels	297.20	297.07
Of which	-	-
sustainable biofuels produced from feedstock listed in Annex IX Part A	-	-
other sustainable biofuels eligible for the target set out in Article 3(4)e	-	-
sustainable biofuels produced from feedstock listed in Annex IX Part B	-	-
sustainable biofuels for which the contribution towards the renewable	-	-

		2017	2018
energy target is limited according to Article 3(4)d			
Imported from third countries		-	-
Hydrogen from renewables		0	0
Renewable electricity		40.42	38.80
Of which			
consumed in road transport		1.42	1.44
consumed in rail transport		38.22	36.66
consumed in other transport sectors		0.78	0.7
other (Please specify)			
other (Please specify)			
TOTAL	without multiplier	**337.63**	**335.86**
	with multiplier	**400.62**	**396.60**
Gross final consumption of energy in the transport sector (ktoe)	without multiplier	6 051.40	6 198.7
	with multiplier	6 108.74	6 253.69
RES-T share (%)		**6.56**	**6.34**

Source: The National Statistics Institute (Institutul Național de Statistică)

Only biofuels meeting the sustainability criteria were reported in the analysed period 2017-2018.

The comparison between the values of gross final consumption of electricity, final consumption of energy for heating and cooling, and gross final consumption of energy in the transport sector in **Tables 1.b, 1.c, 1.d** and the corresponding NREAP values, against the background of a GDP growth rate of 7.0 % in 2017 and 4.1 % in 2018 compared to 5.3 % and 4.8 % forecast in the NREAR, revealed that:

- The gross final consumption of energy in 2017 and 2018, respectively, was below the value estimated in the increased energy efficiency scenario due to the economic and financial crisis of 2008-2012, followed by economic restructuring, and to the measures adopted in the National Energy Efficiency Action Plans for 2007-2013 and 2014-2020 (NEEAP III and NEEAP IV). Thus, gross final consumption achieved in the period 2017-2018 equates to 84.3 % of the values estimated in the NREAP.
- Consumption of electricity from RES reached 2 144,9 thousand toe in 2017 compared to 2 544 thousand toe in the NREAP. The actual gross final consumption of electricity in 2017 reached 5 250 thousand toe compared to the projected value of 5 975 thousand toe in the NREAP. Under the above conditions, namely the decrease in the gross final consumption of energy compared to the projected values, the share of consumption of electricity from RES in the gross final consumption of electricity was 41.97 % in 2017, which is slightly below the projected value of 42.57 % in the NREAP. In 2018 this share was 41.79 %, which is below the projected value of 42.84 % in the NREAP.
- The consumption of energy from RES in transport, in compliance with the sustainability criteria of Directive 2009/28/EC, was 337.61 thousand toe in 2017, compared to the estimated 482.9 thousand toe in the NREAP. Considering that the gross final consumption of energy in the transport sector is 6 051.4 thousand toe, compared to the estimated consumption of 5 485 thousand toe in the NREAP, the 6.56 % share of consumption of energy from RES in the transport sector is below the projected share of 8.8 % in the NREAP. In 2018, the 6.34 % share of consumption of energy from RES in the transport sector was below the projected share of 9.23 % in the NREAP.

- Consumption of energy from RES for heating/cooling was 3 557.8 thousand toe in 2017, which is higher than the projected consumption value (3 220 thousand toe), of which 85.7 % is consumption of energy from the biomass used in households (firewood). In 2017, the share of consumption of energy from RES for heating and cooling in the total energy consumption for heating and cooling was 26.58 % compared to the projected value of 18.07 % in the NREAP. In 2018, the share of consumption of energy from RES for heating and cooling in the total energy consumption for heating and cooling was 25.43 % compared to the projected value of 18.86% in the NREAP.
- At national level, the total consumption of energy from RES was 6 039.9 thousand toe in 2017. The share of consumption of energy from RES in the gross final consumption of energy was 24.45 % in 2017 compared to the projected share of 21.21 % in the NREAP. In 2018, the share of consumption of energy from RES in the gross final consumption of energy was 23.87 % compared to the projected share of 21.83 % in the NREAP.

2. Measures taken in 2017 and 2018 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 the National Renewable Energy Action Plan in Romania [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 outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
1. Establishing the Regulation for the issue of green certificates (GC): Calculation of the quantity of RES-E that benefits from the GC promotion system, as provided for by Law No 220/2008. The issue of GCs. Stakeholders and their obligations in the issue of GCs (**Order No 4/2015 of ANRE**)	Regulation	Provides for the legal framework required to extend the use of RES	The Transmission and System Operator (TSO), as the GC issuer; The economic operators accredited by ANRE to benefit from the GC promotion system; Network operators, to whose networks power plants generating electricity from renewable sources are connected, in order to confirm the outputs of electricity from renewable energy sources supplied by them to the electricity grids and/or to consumers.	Existing	Entered into force in February 2015
2. Amendment to the Regulation for the issue of GCs, as established by Order No 4/2015 of ANRE The Regulation for the issue of green certificates is amended as follows: The number of GCs issued by the TSO to an accredited economic operator on a monthly basis shall be determined as the product of the quantity of RES-E, as established by Article 10, by the number of GCs which the economic operator, depending on the respective type of technology, must receive for each 1 MWh produced and supplied to the electricity grid and/or to the consumer. From 1 April 2017 to 31 December 2024, TSO shall postpone from trading on the green certificates market, including from transfer from the producer's account to the supplier's account to achieve the annual mandatory acquisition quota of green certificates, two of the green certificates issued in accordance with Article 11, for each 1 MWh produced and supplied by photovoltaic power plants accredited by	Regulation	Provides for the legal framework required to extend the use of RES	The Transmission and System Operator (TSO), as the GC issuer; The operator of the GC market; The economic operators accredited by ANRE to benefit from the GC promotion system; The economic operators for the quantities of RES-E produced from high-efficiency cogeneration using energy crops. The accredited economic operators producing electricity from industrial, municipal and other waste.	Existing	Entered into force on 23 August 2017

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
ANRE. **Article 16** (1) For the GCs postponed from trading, including from transfer from the producer's account to the supplier's account to achieve the annual mandatory acquisition quota of GCs under Article 12, GCs shall be issued for trading on a monthly basis, in a staggered manner, from the date when postponement from trading has ceased, as follows: **a.** from 1 January 2018 to 31 December 2025 for new hydropower plants with installed capacity of not more than 10 MW and for wind power plants; **b.** between 1 January 2025 and 31 December 2030 for photovoltaic power plants; (2) the number of GCs issued on a monthly basis for trading to an economic operator for a power plant accredited in accordance with paragraph (1) shall be set by the TSO at a value equal to the ratio of the total number of GCs postponed in the postponement period under Article 12 to the total number of months of the recovery period referred to in paragraph (1). (**Order No 79/2017 of ANRE**)					
3. Amendment to the Regulation for the issue of GCs, as established by Order No 4/2015 of ANRE The Regulation is amended as follows: The existence of certificates of origin and of other documents issued either by the relevant ministries under Article 3(10) of the Law, or by institutions subordinated to those ministries shall be checked on a half-yearly basis and they shall show the quantities of RES used by producers to produce electricity in the previous semester in the accredited power plants. The certificates of origin and other documents issued either by the relevant ministries under Article 3(10) of the Law, or by institutions subordinated to those ministries shall be submitted to the TSO and they shall show the quantities of RES used by producers to produce electricity and the test reports showing the lower calorific value of the fuels used. (**Order No 33/2018 of ANRE**)	Regulation	Provides for the legal framework required to extend the use of RES	The Transmission and System Operator (TSO), as the GC issuer; The economic operators producing electricity, which are accredited by ANRE to benefit from the GC promotion scheme;	Existing	Entered into force on 7 February 2018
4. Amendment to the Regulation for the issue of GCs, as established by Order No 4/2015 of ANRE The following Articles of the Regulation for the issue of green certificates are	Regulation	Amends the legal framework required to extend the use of RES	The Transmission and System Operator (TSO), as the GC issuer; The economic	Existing	Entered into force on 2 September 2018

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
amended: Article 10(1), (2), and (3^1) Article 12(1^l) Article 16(1)(b) Article 18(2)(b) Article 19(6) The TSO shall issue GCs to the accredited economic operators on a monthly basis, starting from the date of issue of the accreditation decision by ANRE, for the quantity of electricity produced in power plants using RES minus the quantity of electricity required for their own technological consumption. Where, for the location of the power plant, electricity is purchased from the electricity grid based on the information provided by the accredited economic operators, the TSO shall issue the GC once it has validated the calculations submitted by the accredited economic operators, whereby they determine the amount of RES-E benefitting from the GC. From 1 April 2017 to 31 December 2020, TSO shall postpone from trading on the green certificates market, including from transfer from the producer's account to the supplier's account to achieve the annual mandatory acquisition quota of green certificates, two of the green certificates issued in accordance with Article 11, for each 1 MWh produced and supplied by photovoltaic power plants accredited by ANRE. (**Order No 163/2018 of ANRE**)			operators accredited by ANRE to benefit from the GC promotion system		
5. Methodology establishing the annual static quantity of GCs and the annual mandatory acquisition quota of GCs This methodology also includes the calculation of the number of GCs for failure to achieve the estimated annual quota of GCs afferent to each quarter of the analysis year by economic operators having an obligation to acquire GCs; the method of calculation of the monetary value for failure to achieve the annual mandatory acquisition quota of GCs. (**Order No 78/2017 of ANRE**; **Order No 157/2018 of ANRE)**	Regulation	Increase in the installed capacity in units using RES	The economic operators having the obligation to acquire GCs in order to achieve the annual mandatory quota of GCs; Producers of electricity from RES, which are holders of GCs; The Transmission System Operator (TSO); The operator of the GC market; Electro-intensive industrial consumers, which are exempted from the application of Article 8 of Law	Existing	In force from 24 August 2017 until 31 July 2018. Entered into force on 01 August 2018

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
			No 220/2008 under Government Decision No 495/2014 establishing a State aid.		
6. Establishment of the Regulation for the organisation and functioning of the green certificates market This Regulation includes: the organisation and functioning of the green certificates market; the stakeholders and responsibilities in the organisation and functioning of the green certificates market; registration and management of the information on trading in green certificates; the information needed to monitor the functioning of the green certificates market (**Order No 77/2017 of ANRE**; **Order No 65/2018 of ANRE; Order No 178/2018 of ANRE**)	Regulation	Development of the market mechanisms with reference to the promotion of GCs	Participants in the green certificates market The operator of the green certificates market as an organiser and a manager of the green certificates market and as administrator of the green certificates ledger The Transmission and System Operator as the GC issuer.	Existing	Entered into force on 1 September 2017. Entered into force on 30 March 2018. Entered into force on 1 December 2018
7. Establishment of the Methodology for monitoring the system of promotion of electricity from renewable energy sources through green certificates. This methodology shall: **a**. determine the indicators that enable to track the effects of the GC support system for promoting energy from RES as regards the development of the use of these resources, the return on investment in this area and its impact on the price of electricity at final consumers; **b**. follow up on the temporal trend in the rate of achievement of the proposed targets for the share of electricity from RES in the gross final consumption of electricity; **c**. lay down the necessary information, the providers thereof, and its frequency and reporting format; **d**. determine the content and frequency of monitoring reports. The monitoring outputs shall be used to determine whether the application of the green certificate support system leads to overcompensation, to prepare the reports for the national and European public authorities and to prepare proposals to improve the green certificate support system and the related secondary legislation. (**Order No 52/2016 of ANRE**)	Regulation	Monitoring the RES-E promotion system	ANRE Producers holding units producing energy from RES, the economic operators having the obligation to purchase GCs, as provided for in Article 8 of Law No 220/2008, network operators and the GC market operator	Existing	Entered into force on 29 June 2015.
8. Rules on registration in the Green Certificates Ledger of the GCs consumed in order for economic	Regulation	Management of GCs	The operator of the electricity and natural gas market, i.e.	Existing	Entered into force on 5 September

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
operators to meet their GC purchasing obligations for 2018 (**Order No 164/2018 of ANRE**)			OPCOM; The economic operators having GC purchasing obligations		2018
9. The billing procedure for green certificates establishes: the billing of GCs to final consumers; the adjustment of GCs for final consumers; Reporting obligations relating to the billing/adjustment of GCs afferent to the electricity billed/supplied to final consumers by electricity suppliers, distribution operators, other than concessionaire distribution operators, which resell the electricity purchased from one or several electricity suppliers to final customers of electricity connected to their electricity distribution grids and by producers of electricity that supply electricity to consumers connected by direct lines to their power plants. (**Order No 187/2018 of ANRE**)	Regulation	Billing of GCs	Electricity suppliers, in the billing/adjustment of GCs for final customers; Producers of electricity that supply electricity to the customers connected by direct lines to their power plants, in the billing/adjustment of GCs at final customers; Distribution operators, other than concessionaire distribution operators, that resale the electricity purchased from one or several electricity suppliers to final customers of electricity connected to their electricity distribution grids.	Existing	Entered into force on 12 November 2018
10. Approval of the Regulation for accreditation of producers of electricity from RES to apply the GC promotion system. This Regulation includes: **a**. the stages of the accreditation process and the content of the accreditation documentation; **b**. the accreditation requirements; **c**. the application of the GC promotion scheme; **d**. the rights and obligations of economic operators whose power plants have been accredited; **e**. the conditions for the modification, suspension and withdrawal of accreditation. (**Order Nos 48/2014 and 179/2018 of ANRE**)	Regulation	Increase in the installed capacity in units using RES	Producers of electricity using RES	In force (amendments and supplements to Law No 220/2008)	Entered into force on 1 June 2014, repealed on 24 0ctober 2018. Entered into force on 24 October 2018.
11. Ensuring balance between producers of electricity from RES and final customers in the context of further supporting the production of electricity from RES in order to maintain the 24 % national target. Starting with the analysis year 2018, ANRE	Regulation	Participants in the electricity and green certificates market	Producers/Suppliers	Existing	Entered into force on 31 March 2017

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
has established under an order, by 1 March each year, the mandatory annual quota for purchase of green certificates for the previous year, based on the static quantity of green certificates and the final electricity consumption in the previous year, but without exceeding the average consumer impact of EUR 11.1/MWh, as set having regard to the weighted average price of transactions on the centralised anonymous spot market of green certificates in the previous year. The annual static quantity of green certificates, as reported by ANRE, is approved by Government decision, at the proposal of the Ministry of Energy, within 60 days from the date of its reporting by ANRE. From 1 April 2017 to 31 December 2024, the trading in two green certificates for solar power plants is temporarily postponed for each 1 MWh produced and supplied by producers of RES-E, which were accredited by ANRE by 31 December 2013. (**Government Emergency Order No 24/2017**)					
12. Starting with the analysis year 2018, ANRE has established under an order, by 1 March each year, the mandatory annual quota for the purchase of green certificates for the previous year based on the final electricity consumption in the previous year, so that the average final consumer impact is not more than EUR 11.7/MWh in 2018, EUR 12.5/MWh in 2019, EUR 13/MWh in 2020 and 2021 and EUR 14.5/MWh from 2022 onward. The economic operators referred to in Article 8(1) of Law No 220/2008 shall purchase from the centralised anonymous spot market of green certificates, both annually and quarterly, a minimum of 50 % of the number of green certificates afferent to the achievement of the annual mandatory quota for the acquisition of green certificates, with the exception of bilateral contracts concluded prior to the entry into force of Government Emergency Order No 24/2017 and/or the number of green certificates transferred from the producer's account to the supplier's account where the economic operator has the obligation to purchase green certificates and acts as both a producer	Regulation	Participants in the electricity and green certificates market	Producers/Suppliers	Existing	Entered into force on 23 July 2018

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
and a supplier.' (**Law No 184/2018**)					
13. The quantity of electricity for which the obligation to purchase green certificates is established includes electricity used by a producer of electricity for own final consumption, other than technological consumption and consumption required for extraction, preparation and handling of the feedstock used in the production of electricity, for a producer of electricity that also deals with the extraction, preparation and handling of the feedstock used in the production of electricity, irrespective of the consumption location and of the means of transport of the extracted feedstock (**Law No 360/2018**)	Regulation	Participants in the electricity and green certificates market	Producers/Suppliers	Law amending Article 8(1)(b) of Law No 220/2008 establishing the system for promoting the production of RES-E.	This measure has not been notified to the European Commission yet, therefore it is not yet applicable
14. Development of electricity transmission and distribution grids to ensure the discharge of electricity produced by power plants using RES [Outlook Plan for the electricity transmission grid (ETG) and the electricity distribution grid (EDG) for 2016-2025 developed by CN Transelectrica SA, SC ENEL SA, SC CEZ SA, SC Electrica SA SC DELGAZ Grid SA]	Investments	Ensuring the transmission and distribution of electricity produced from RES under conditions of secure operation of the National Electricity System (NES)	CN Transelectrica SA, SC ENEL SA, SC CEZ SA, SC Electrica SA, SC DELGAZ Grid SA, Producers of electricity using RES	Planned	Entered into force in 2016 Estimated validity: 2021-2025
15. Large Infrastructure Operational Programme (LIOP) **Priority Axis 6** Promoting clean energy and energy efficiency in order to sustain low-carbon economy Specific Objective 6.1 Increasing production of energy from less exploited renewable resources (biomass, biogas, geothermal)	Financial	Developing and/or upgrading the capacities producing electricity and/or heat from biomass and biogas; Developing and upgrading the capacities producing heat from geothermal energy. Supporting investments in extension and upgrading works to electricity distribution grids with the purpose of taking over the energy produced from renewable resources under conditions of safety in the operation of NES	Administrative territorial units covering areas with potential for use of RES such as geothermal or biomass/biogas sources. Companies active in the production of energy for marketing purposes	Existing	2014-2020
16. Regional Operational Programme (ROP) **Priority Axis 3** Supporting the shift towards a low-carbon	Financial	Environmentally friendly means of transport	Central and local public authorities	Existing	2014-2020

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
economy (the National Environmental Fund) **Priority Axis 4** Sustainable urban development					
17. The National Environmental Fund	Financial	Increase in the installed capacity in electricity and heat production units using RES	Electricity and heat producers	Existing	
18. Programme for the installation of heating systems using renewable energy, including the replacement or completion of classical heating systems under the GREEN HOUSE (**CASA VERDE)** scheme for natural and legal persons	Financial	Increase in the installed capacity in energy production units using RES	Population and administrative territorial units, public institutions and religious establishments	Existing	
19. The possibility of purchasing electric and/or hybrid vehicles under the incentive programme for the renewal of the national vehicle fleet.	Financial	Increase in the number of electric and hybrid vehicles used	Manufacturers and dealers of vehicles and natural and legal persons purchasing vehicles	Existing	
20. Determination of the biofuel content for the petrol and diesel placed on the market (**Government Decision No 935/2011**)	Regulation	Increase in biofuel consumption	Fuel producers	Existing	Entered into force on 11 October 2011 Amended and supplemented by: Government Decision No 918/2012 Government Decision No 1308/2012 Government Decision No 112/2013 Government Decision No 931/2017 Repealed by Government Emergency Order No 80/2018 establishing the conditions for the placing on the market of petrol and diesel, introducing a mechanism for monitoring and reducing greenhouse

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
					gas emissions and establishing the methods for calculating and reporting the reduction of greenhouse gas emissions
21. Establishment of conditions for the placing on the market of petrol and diesel and the introduction of a mechanism for monitoring and reducing greenhouse gas emissions. (**Government Decision No 928/2012**)	Regulation	Implementation of the principles of sustainable development	Fuel producers	Planned	Entered into force on 31 December 2012 Amended and supplemented by Government Decision No 918/2012 Government Decision No 1308/2012 Government Decision No 112/2013 Government Decision No 931/2017 Repealed by Government Emergency Order No 80/2018
22. Certification of compliance with the sustainability criteria for biofuels and bioliquids, which are voluntary schemes recognised by the European Commission for demonstrating compliance with the sustainability criteria under Directive 2009/28/EC (Order No 136/2012 of the Minister for the Economy and Business Environment)	Regulation	Transposition of the Union law	Fuel producers	Planned	Entered into force on 8 February 2012 Estimated validity.
23. Deployment of the alternative fuels infrastructure. The measures intended for the deployment of the alternative fuels infrastructure are provided for in order to minimise dependence on oil and to mitigate the environmental impact of transport. It sets out minimum requirements for the building-up of alternative fuels infrastructure, including recharging points for electric vehicles and compressed gas, liquefied gas and	Regulation	Development of the alternative fuels market	Producers/Suppliers/ Users		Entered into force on 28 May 2017

Name and reference of the measure	Type of measure	Expected outcome	Targeted group and/or activity	Existing or planned	Start and end dates of the measure
hydrogen refuelling points, to be implemented by means of the national policy frameworks and the common technical specifications for such recharging and refuelling points, and user information requirements. (**Law No 34/2017**)					
24. Strategy on the national policy framework for development of the alternative fuels market in the transport sector and the deployment of the relevant infrastructure in Romania, and on the set-up of the Inter-ministerial Coordination Council for Development of the Alternative Fuels Market. The Strategy on the national framework has been prepared in accordance with Chapter II of Law No 34/2017 on the deployment of the alternative fuels infrastructure transposing Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure. (**Government Decision No 87/2018**)	Strategy	The national policy framework for the development of the alternative fuels market in the transport sector.	Producers/Suppliers/ Users		Entered into force on 13 March 2018
25. Establishment of conditions for the placing on the market of petrol and diesel, for introducing a mechanism for monitoring and reducing greenhouse gas emissions, and for establishing the methods for calculating and reporting the reduction of greenhouse gas emissions (**Government Emergency Order No 80/2018**)	Regulation		Producers/Suppliers/ Users		Entered into force on 19 September 2018 to amend and supplement Law No 220/2008 establishing the system for promoting the production of energy from renewable sources.

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) of Directive 2009/28/EC]

The assessment and improvement of administrative procedures for the use of energy from renewable sources and the alignment of these procedures to the European Union (EU) standards are constant concerns of all the review and decision-making bodies at national, regional and local level.

Directive 2009/28/EC was transposed into the national law with the adoption of Law No 220/2008 establishing the system for promoting the production of RES-E, which planned to make the GC

promotion system more attractive for investors by introducing new facilities, including the award of a larger number of green certificates, which are differentiated by the type of RES-E production technology.

The system for promoting the production of RES-E, as established by Law No 220/2008, as republished, as subsequently amended and supplemented, was authorised by the European Commission in July 2011 by *Decision C (2011) 4938 regarding the State aid SA. 33134 (2011/N) for Romania - Green certificates for promoting electricity from renewable sources*, as amended in 2015 by Decision C(2015) 2886 and in 2016, by Decision C(2016) 8865/2016.

In 2017 and 2018, the following documents that amended the existing legislative framework, were issued in the field of energy from renewable sources:

- Law No 184/2018 approving Government Emergency Order No 24/2017 amending and supplementing Law No 220/2008 establishing the system for promoting the production of energy from renewable sources and amending certain legislative acts.
- Law No 360/2018 amending Article 8(1)(b) of Law No 220/2008 establishing the system for promoting the production of energy from renewable sources.

The main actions and measures adopted in the reporting period 2017-2018 are listed below.

a. Improving the system of mandatory quotas of electricity produced from renewable energy sources, combined with the trading in Green Certificates

As stated in the Second Report (2011-2012), **Law No 220/2008** established the legal framework for setting up a mechanism to promote the production of electricity from renewable sources by applying the system of mandatory quotas combined with the trading in Green Certificates (GC).

Compared to the form authorised by the European Commission in 2011, Law No 220/2008, which was republished with subsequent amendments and supplements, was amended by legislative acts. The legislative acts and the main amendments are as follows:

- **Law No 23/2014 approving Government Emergency Order No 57/2013 amending and supplementing Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources**
  - The non-application of the system for promoting the electricity produced in photovoltaic power plants located on lands listed for agricultural purposes under the law on 31 December 2013.
  - The postponement of a number of green certificates from trading, according to the type of RES, for producers holding RES-E plants commissioned on 31 December 2013 inclusive.
  - The postponed green certificates are to be recovered from 1 April 2017 for new hydropower plants and solar power plants and from 1 January 2018 for wind power plants, in a staggered manner until 31 December 2020.
  - These provisions were amended, in accordance with Article I(11) of Government Emergency Order No 24/2017, and the postponed GCs are to be recovered from 1 January 2025, being staggered equally and monthly up to 31 December 2030.
  - The annual mandatory quotas for electricity produced from renewable energy sources, which benefited from the green certificates promotion system, were the following: 8.3 % - 2010; 10 %

- 2011; 12 % - 2012; 14 % - 2013; From 2014 onward, ANRE has monitored on a yearly basis the annual quotas for electricity produced from renewable energy sources, which were covered by the green certificates promotion system and, based on the rate of achievement of the national target and the impact on the final customer, it estimated, published on its website and informed the Government by 30 June of the current year of the annual mandatory quota for the electricity produced from renewable energy sources, which is covered by the green certificate support system for the following year.

- For the electricity produced in power plants using biomass from energy crops, a green certificate is awarded for each 1 MWh produced and supplied in addition to the provisions of paragraph 2(d).
- The green certificates issued by the Transmission System Operator (TSO) have a 12-month validity period.
- This provision was amended in accordance with Article IX of Government Emergency Order No 24/2017, the GCs postponed from trading as of 1 July 2013 being valid and tradable until 31 March 2032.
- The removal of the guarantee fund administered by the economic operator of the electricity market.
- Producers of electricity from renewable energy sources, which hold power units/plants having installed capacities of up to 1 MW per producer and 2 MW per producer for high efficiency cogeneration based on biomass, which are entitled to the support system, may conclude bilateral contracts for the sale/purchase of energy and of green certificates negotiated directly only with suppliers to final customers, being exempted from their centralised trading.
- Non-inclusion of the value of non-purchased green certificates in the bill to the final customer.
- Non-application of the support system for the electricity produced from renewable sources for the quantities of electricity supplied by the dispatchable power units in addition to the quantities of electricity in the hourly physical notifications submitted by producers of electricity from renewable sources to the transmission system operator.

- **Law No 122/2015 approving certain measures for promoting the production of electricity from renewable energy sources, and amending and supplementing certain administrative acts.**
  - Trading in green certificates is allowed for producers of electricity from renewable energy sources and for economic operators having the obligation to purchase green certificates in a transparent, centralised, and non-discriminatory manner on the centralised markets administered by the electricity market operator.
  - For producers of electricity and economic operators which operate commercially RES-E production plants with an installed capacity above 125 MW, any potential negative differences between the number of green certificates received and the number of green certificates due under the Commission's individual decision are adjusted based on a decision issued by ANRE which issues additional green certificates for trading in their favour within a maximum of 24 months from the date of issue of the Commission's Decision.
  - The economic operator holding installed capacities between 125 MW and 250 MW, which did not benefit from the green certificate support system or for which the Commission did not issue individual authorisation decisions, will be accredited by ANRE without the need to procure the individual authorisation decision from the Commission. Any potential differences between the

number of green certificates received and the number of green certificates due under the law will be adjusted within not more than 24 months from the date of issue of the accreditation.

- The competent ministry, in collaboration with ANRE, shall prepare the mechanism for launching the green certificate promotion scheme for the production of electricity from renewable sources for producers in other EU Member States, which is approved by a Government decision.

  The green certificate support system was valid until 31 December 2016 under Article 2554 of the New Civil Code and Council Regulation (EC, Euratom) No 1182/71 of 3 June 1971 as regards the establishment of rules applicable to periods, dates and the expiry of deadlines.
- The system for promoting the production of electricity from RES does not apply to energy produced from renewable energy sources and sold at negative prices.
- In accordance with Law No 123/2012, as updated, the competitive mechanisms of the electricity market already do not allow for the sale of electricity at negative prices, therefore these provisions are applied.
- The competent ministry, together with ANRE, shall prepare and submit to the Government for approval the State aid scheme to support the production of energy from renewable sources in power plants with installed capacities of less than 500 kW per plant, with adjusted prices defined per technology, within 90 days from the date of entry into force of Law No 122/2015, after which it will be approved by a Government decision within 30 days from the date of its communication by the competent ministry.
- These provisions were repealed by Article II of Government Emergency Order No 24/2017.
- The value of green certificates on the electricity bill sent to final customers is billed separately from the electricity charges/prices, with an indication of the legal basis. This amount represents the product of the value of the annual mandatory purchase quota for green certificates (GC/MWh), as estimated by ANRE, by the quantity of electricity billed (MWh) and by the price of the green certificates, which is calculated as the weighted average price of the transactions on the centralised green certificates market in the month preceding the billing month or the last monthly weighted average available.

- **Government Emergency Order No 24/2017 amending and supplementing Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources and amending certain legislative acts**
  - Ensuring balance between producers of electricity from renewable sources and final customers, in the context of further supporting the production of energy from renewable sources in order to maintain the national target of 24 %
  - A green certificate may be subject to a single transaction between the producer as the seller and the supplier as the buyer.
  - Green certificates issued for own production achieved in the period of validity of the accreditation decision are to be traded until 31 March 2032, including after the period of validity of the accreditation decision has expired.
  - It is prohibited to extend the directly negotiated bilateral contracts after the entry into force of the Order.
  - From 1 April 2017 to 31 December 2024, the trading in two green certificates for solar power plants is temporarily postponed for each 1 MWh produced and supplied by producers of electricity from renewable sources, which were accredited by ANRE by 31 December 2013.

- Trading in green certificates issued for the production of RES-E in the period of validity of the accreditation decision, until 31 March 2032, including after the period of validity of the accreditation decision has expired.
- Starting with the analysis year 2018, ANRE has established under an order, by 1 March each year, the mandatory annual quota for purchase of green certificates for the previous year, based on the static quantity of green certificates and the final electricity consumption in the previous year, but without exceeding the average consumer impact of EUR 11.1/MWh, as set having regard to the weighted average price of transactions on the centralised anonymous spot market of green certificates in the previous year.
- The annual static quantity of green certificates, as reported by ANRE, is approved by Government decision, at the proposal of the Ministry of Energy, within 60 days from the date of its reporting by ANRE.
- The introduction of anonymous markets for trading in green certificates.
- The introduction of the electricity market, where trading in electricity is associated with green certificates related to electricity.

- **Law No 184/2018 approving Government Emergency Order No 24/2017 amending and supplementing Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources and amending certain legislative acts**
  - Starting with the analysis year 2018, ANRE has established under an order, by 1 March each year, the mandatory annual quota for the purchase of green certificates for the previous year based on the final electricity consumption in the previous year, so that the average final consumer impact is not more than EUR 11.7/MWh in 2018, EUR 12.5/MWh in 2019, EUR 13/MWh in 2020 and 2021 and EUR 14.5/MWh from 2022 onward.
  - The economic operators referred to in Article 8(1) of Law No 220/2008 shall purchase from the centralised anonymous spot market of green certificates, both annually and quarterly, a minimum of 50 % of the number of green certificates afferent to the achievement of the annual mandatory quota for the purchase of green certificates, with the exception of bilateral contracts concluded prior to the entry into force of Government Emergency Order No 24/2017 and/or the number of green certificates transferred from the producer's account to the supplier's account where the economic operator has the obligation to purchase green certificates and acts as both a producer and a supplier.
  - It guarantees that all green certificates estimated to be issued between 1 April 2017 and 31 December 2031 are taken over, including green certificates postponed from trading, provided that final annual electricity consumption does not fall below the average recorded in the period 2017-2022.
  - By way of derogation from Article 23 of Law No 123/2012 on electricity and natural gas, as subsequently amended and supplemented, and from Article X of Government Emergency Order No 24/2017 amending Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources and amending certain legislative acts, electricity producers and public authorities holding power plants from renewable energy sources benefiting from the green certificate promotion system or which benefited from the promotion system and hold green certificates, with installed capacities of not more than 3 MW per producer, may conclude directly negotiated contracts only with suppliers to final customers for the sale of electricity and/or green certificates.

- Prosumers holding units producing electricity from renewable sources with installed capacity of not more than 27 kW per consumption location can sell the electricity produced and fed into the electricity grid to the electricity suppliers with which they have concluded electricity supply contracts, in accordance with the ANRE regulations.
- The quantity of electricity for which the obligation to purchase green certificates has been established includes the electricity produced in Romania and sold by suppliers to consumers/suppliers outside Romania through bilateral electricity transactions in the countries with which the Romanian Government has signed bilateral agreements to this effect.

- **Law No 360/2018 amending Article 8(1)(B) of Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources**
  - The quantity of electricity for which the obligation to purchase green certificates is established includes electricity used by a producer of electricity for own final consumption, other than technological consumption and consumption required for extraction, preparation and handling of the feedstock used in the production of electricity, for a producer of electricity that also deals with the extraction, preparation and handling of the feedstock used in the production of electricity, irrespective of the consumption location and of the means of transport of the extracted feedstock. This measure has not been notified to the European Commission yet, therefore it has not been transposed yet into the secondary law.

The following adjacent regulations were applicable in 2018:

- ✓ The Regulation for accreditation of producers of electricity from renewable energy sources for the application of the green certificate promotion system, as approved by Order No 48/2014 of the President of ANRE, as subsequently amended and supplemented, as repealed with the entry into force of the Regulation amending, suspending, terminating and withdrawing the accreditation granted to power plants producing electricity from renewable energy sources, and establishing the rights and obligations of accredited producers of electricity, as approved by Order No 179/2018 of the President of ANRE.
- ✓ The Regulation for the issue of green certificates, which was approved by Order No 4/2015 of the President of ANRE, as subsequently amended and supplemented in 2018 by Order No 163/2018 of the President of ANRE.
- ✓ The Regulation for the organisation and functioning of the green certificates market, which was approved by Order No 77/2017 of the President of ANRE, as subsequently amended and supplemented in 2018 by Orders No 65/2018 and No 178/2018 of the President of ANRE.
- ✓ The methodology for determining the annual static quantity of green certificates and the annual mandatory quota for the purchase of green certificates, as approved by Order No 78/2017 of the President of ANRE, which was repealed with the entry into force of the Methodology for determining the annual mandatory quota for purchase of green certificates, as approved by Order No 157/2018 of the President of ANRE.
- ✓ Rules for listing in the Register of Green Certificates the green certificates consumed by economic operators in order to meet their obligation to purchase green certificates for the analysis year 2018, as approved by Order No 164/2018 of the President of ANRE.
- ✓ The procedure for billing green certificates, as approved by Order No 187/2018 of the President of ANRE.

- ✓ Order No 226/2018 of ANRE approving the rules for trading electricity produced in power plants from renewable energy sources with installed capacity of not more than 27 kW belonging to prosumers.
- ✓ The methodology for monitoring the system for promoting electricity from renewable energy sources through green certificates, as approved by Order No 52/2016 of the President of ANRE.

2.b Measures taken to ensure the transmission and distribution of electricity produced from renewable energy sources and to improve the framework or rules for bearing or sharing the costs related to grid connections and grid reinforcements. [Article 22(1)(f) of Directive 2009/28/EC]

Law No 123/2012 on electricity and natural gas, as published in Official Gazette of Romania No 485 of 16 July 2012, replaces Law No 13/2007 on energy, transposing mainly Directives 2009/72/EC and 2009/73/EC.

Law No 123/2012 contains **Chapter V**. Promotion of electricity produced from renewable energy resources and high-efficiency cogeneration.

Under the law, the competent authority establishes by technical and commercial rules:

- guaranteed access to electricity grids and priority dispatching of the electricity produced from renewable energy sources and high-efficiency cogeneration;
- priority access to the electricity grids and priority dispatching of the electricity produced from renewable energy sources and high-efficiency cogeneration in plants with installed capacities of up to 1 MW, insofar as the security level of the NES is not affected.

In accordance with the law, the criteria for the promotion of electricity produced from renewable sources envisage:

- the achievement of the national target for the share of electricity produced from renewable energy sources;
- compatibility with the market competitive principles;
- the characteristics of different renewable energy sources and power generation technologies;
- promotion of the most effective use of renewable energy sources.

In accordance with Law No 123/2012, users (the electricity production licence holder and the final customer) have regulated access to the electricity grids of public interest. Access to the electricity grids of public interest is a mandatory service under regulated conditions, which must be discharged by the Transmission System Operator (TSO) and the Distribution Operator (DO). The steps and procedures required to connect users to the transmission and distribution grids are laid down in the Regulation on the connection of users to public interest grids, as approved by ANRE.

The following ANRE Orders are currently in force:

1. **Regulation on the connection of users**

- Order No 59/2013 approving the Regulation regarding solutions for connecting users to electricity grids of public interest, as amended by Order No 64/2014 of ANRE, as amended by Order No 111/2018, as amended by Order 15/2019

2. **Regulation laying down the connection solutions**
   - Order No 102/2015 approves the Regulation laying down the solutions for connecting users to the electricity grids of public interest;
3. **The location approval**
   - Order No 25/2016 approving the Methodology for the issue of location approvals by grid operators
4. **The technical connection approval**
   - Order No 74/2014 approving the framework content of connection approvals
5. **Connection tariffs**
   - Order No 11/2014 approving the Methodology for determining the tariff for connection of users to the electricity grids of public interest, as amended by Annex 1 to Order No 87/2014, as amended by Order No 113/2018;
   - Order No 61/2014 approving the Methodology for determining the tariffs for the issue and updating of connection approvals, connection certificates and location approvals, as amended by Order No 62/2017;
   - Order No 141/2014 approving the specific tariffs and specific indicators used to determine the tariffs for connection of users to the public utility electricity grids, as amended by Order No 113/2018;
   - Order No 114/2014 approving the tariffs for the issue and updating of technical connection approvals, of connection certificates and of location approvals, as amended by Order No 63/2017
6. **Connection contracts**
   - Order No 11/2015 approving the Framework Contract for connection of users to the electricity grids of public interest;
   - Order No 95/2018 approving the binding clauses in the services contracts for the purposes of works related to connection to the electricity grids of public interest, as amended by Order No 185/2018
7. **Energisation for the testing period**
   - Order No 74/2013 approving the Procedure concerning energisation for the testing period and certification of the technical conformity of wind and photovoltaic power plants, as amended by Order No 59/2014**,** as amended by Order No 51/2019**.**
8. **The connection certificate**
   - Order No 5/2014 approving the framework content of connection certificates
9. **Technical rules concerning the technical requirements for connection.**
   - Order No 30/2013 approving the technical rules for connection to the electricity grids of public interest for photovoltaic power plants, as amended by Orders No 74/2013 and No 208/2018;
   - Order No 29/2013 amending and supplementing the technical rule entitled ”Technical conditions for connection to electricity grids of public interest for wind power plants approved by Order No 51/2009, as repealed by Order No 208/2018;
   - Order No 208/2018 approving the Technical Rule regarding the technical conditions for connection to the electricity grids of public interest for generator modules, plants composed of generator modules and plants composed of offshore generator modules;

- Order No 228/2018 approving the Technical Rule entitled “Technical conditions for connection to the electricity grids of public interest for prosumers with injection of active power into the grid”;
- Order No 191/2018 approving the procedure for granting derogations to installations producing electricity from the obligation to meet one or several requirements of those laid down in the technical regulation for connection.

CNTEE Transelectrica SA provides the public transmission service to all users of the electricity transmission networks on a non-discriminatory basis, ensuring the access of any applicant to it under the law and, in particular, avoiding discrimination in favour of the affiliated economic operators, in compliance with the rules and performances laid down in the technical regulations in force.

The expenditure for refurbishing the electricity transmission facilities following the connection of new users or the change in the initial energy characteristics of existing users, including for clearing certain sites, is borne in accordance with the rules in force.

The expenditure for refurbishing the electricity distribution facilities following the connection of new users or the change in the initial energy characteristics of existing users, including for clearing certain sites, is borne in accordance with the rules issued by the competent authority based on objective criteria.

3. The support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan [Article 22(1)(b) of Directive 2009/28/EC]

The support schemes for the promotion of energy from RES, as set out in the NREAP, were operational in the reported period 2017-2018. As a result of the follow-up on the functioning of the scheme for the promotion of electricity from renewable sources in the period 2017-2018, ANRE has outlined the need to bring changes to these schemes. Below are presented the final conclusions of the monitoring reports and the main changes made.

The mandatory quota system, combined with trading in Green Certificates

The mandatory quota system, combined with trading in GCs, was established as a mechanism for promoting the production of electricity from RES under Government Decision No 1892/2004, being reconfirmed by Law No 220/2008 establishing the system for promoting the production of energy from renewable sources, and authorised by the European Commission (EC) in July 2011 by Commission Decision C(2011) 4938 on State aid SA 33134 (20011/N) for Romania — Green certificates for promoting electricity from renewable sources. **Chapter 2.a** elaborated on the revision of the system of mandatory quotas for electricity produced from RES, combined with trading in GCs.

The scheme for promotion of electricity produced from renewable sources by green certificates, as established by Law No 220/2008, as republished with subsequent amendments and supplements, applies to electricity produced and supplied to the electricity grid and/or directly to consumers in new or upgraded/reused plants included in the green certificates promotion scheme, including to the quantity of electricity produced in the period of testing of the operation of power units/plants, and to that used for other own consumption sites connected to the plant bars (except for own technological consumption) and produced from the following renewable energy sources:

- **a.** hydropower used in power plants with installed capacity ≤ 10 MW;
- **b.** wind energy;
- **c.** solar energy;
- **d.** biomass (regardless of its aggregation form) from biowaste (production of electricity or production of electricity from high-efficiency cogeneration);
- **e.** biomass (regardless of its aggregation form) from energy crops (production of electricity only);
- **f.** landfill gas;
- **g.** sewage treatment plant gas.

For a producer of electricity from renewable sources to benefit from the green certificates promotion scheme, they must have been accredited by ANRE by 31 December 2016 in accordance with the provisions of the regulations in force, an accreditation decision being granted to them for the application of the green certificates promotion scheme.

Green certificates are awarded by the Transmission System Operator (TSO) to producers of electricity from renewable sources under Order No 4/2015 of ANRE, as subsequently amended and supplemented.

In accordance with the legal provisions in force on the accreditation date, the number of green certificates received by renewable energy producers for each 1 MWh supplied is between 0.5 GCs and 6 GCs depending on the type of renewable energy source used and the date when the plant was accredited.

Electricity suppliers are obliged to purchase annually a number of green certificates
equivalent to the product of the value of the mandatory quota for purchase of green certificates, as set for that year, by the quantity of electricity supplied to final consumers every year.
The number of GCs that electricity suppliers/producers are obliged to purchase annually per 1 MWh of electricity sold to final consumers is determined as the product of the value of the annual mandatory quota for purchase of green certificates, as set for that year, by the quantity of electricity invoiced annually to final customers by each electricity supplier/producer having the obligation to purchase green certificates. For failure to purchase GCs, penalties are applied to the electricity suppliers/producers having the obligation to purchase green certificates.

From the entry into force of Government Emergency Order No 24/2017, the electricity suppliers had the obligation to purchase annually a number of green certificates resulted from the calculation of the annual mandatory quota of GCs, taking into account the annual static amount of GCs and the final electricity consumption, without exceeding the average impact of the established EUR 11.1/MWh on the invoice to the final consumer, considering the weighted average price of the transactions on the spot market of GCs from the previous year. Subsequently, with the entry into force of Law No 184/2018, electricity suppliers must purchase annually a number of green certificates as the equivalent of the product of the value of the mandatory quota for purchase of green certificates established for that year in accordance with Article 4(91) of Law No 220/2008 by the quantity of electricity from the previous year, so that the average impact on the final customer is not more than EUR 11.7/MWh in 2018, EUR 12.5/MWh in 2019, EUR 13/MWh in 2020 and 2021 and EUR 14.5/MWh from 2022 onward. The value in RON is calculated based on the average exchange rate established by the National Romanian Bank (*Banca Naţională a României*) for the previous year and the price in the green certificates used for the previous year is calculated as a weighted average value of the price in the green certificates from the transactions on the centralised anonymous spot market of green certificates in the previous year.

The annual obligation includes the quarterly purchase obligation to purchase green certificates for the quantity of electricity billed to final customers on a quarterly basis, to which the estimated mandatory quota for purchase of green certificates applies, as established under Article 4(7) of Law No 220/2008, as amended by Law No 122/2015.

When it established the GC purchase quotas, by 31 March 2016, ANRE considered the number of GCs issued on the basis of the information regarding the electricity produced from renewable energy sources for 2018 and the final electricity consumption for 2018, so that the average impact on the final customer is not more than EUR 11.7/MWh in 2018.

As regards the period of validity of the GC, green certificates received by producers of electricity from renewable sources between 1 January 2017 and 31 March 2017, the validity of which was 12 months,

as well as green certificates received as from 1 April 2017 and green certificates postponed from trading as from 1 July 2013, which will be tradable until 31 March 2032, following the entry into force of Government Emergency Order No 24/2017, were traded in 2018 on the market.

As from the date of entry into force of Government Emergency Order No 24/2017, the value of the GC has been determined
on the trading date, not on the issue date, the trading value of green certificates on the green certificates market being determined to range:

a. between a minimum trading value of **EUR 29.4/GC;**
b. and a maximum trading value of **EUR 35/GC.**

The value in RON is calculated at the average exchange rate set by the National Bank of Romania (BNR) for the preceding year.

For failure to achieve the annual purchase quotas, which actually represent the number of GCs that a provider is obliged to purchase for each 1 MWh of electricity sold to final customers, penalties are applied to electricity suppliers, which are obliged to pay the value of the GCs not purchased to the Environmental Fund Administration Agency at the value of **EUR 70/GC** for each green certificate not purchased, as calculated in RON at the average exchange rate set by the National Bank of Romania for the preceding year .

The monitoring of the system for promoting the production of electricity from renewable energy sources in the years 2017 and 2018 has revealed the following:

There were 778 producers of electricity from renewable sources with accreditation at the end of 2016.

At the end of **2017**, there were 774 producers with accreditation, of which 67 use wind energy, 103 use hydropower in power plants with installed capacity of not more than 10 MW, 576 use solar energy and 28 use biomass, including landfill gas and sewage treatment plant gas.

At the end of **2018**, there were 766 producers with accreditation (six of them having plants for two types of production technologies), broken down by type of source, as follows: 66 producers use wind energy, 102 use hydropower in power plants with installed capacity of not more than 10 MW, 576 use solar energy and 28 use biomass, including landfill gas and sewage treatment plant gas.

Table 3.1 shows the trend in the number of producers of electricity from renewable energy sources, which are accredited by type of renewable energy sources, and in the installed electrical capacity in the period 2013-2018.

***Table 3.1*: Total number of accredited producers as at the end of the year**

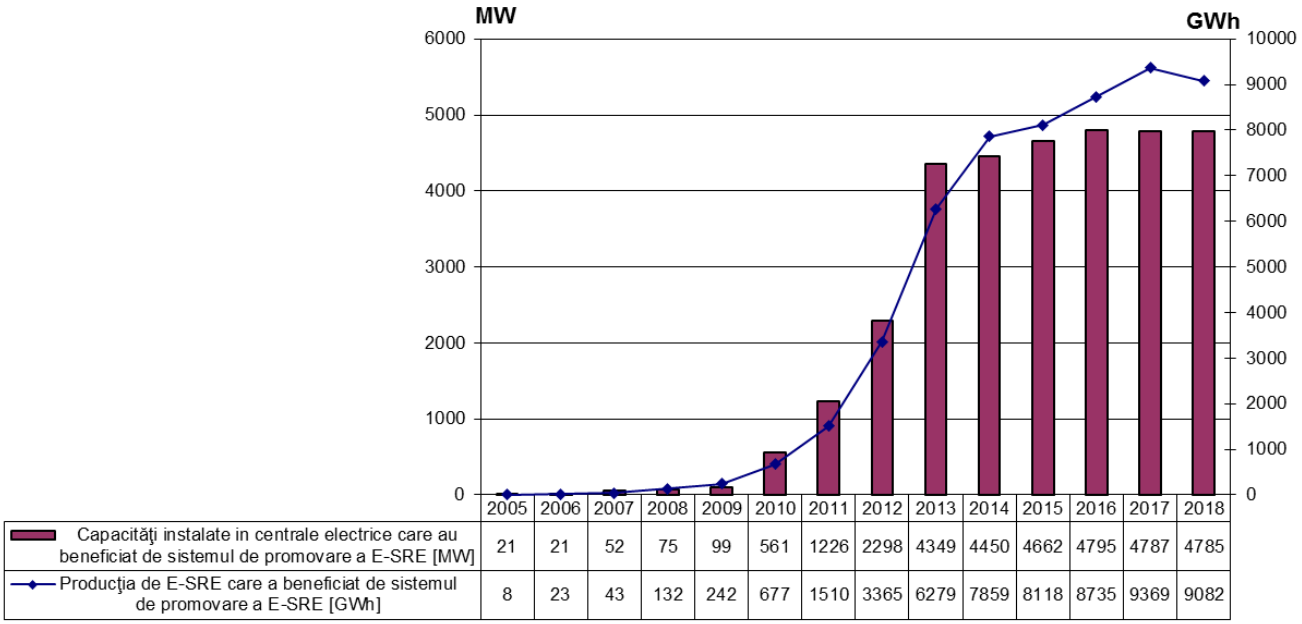
Technology	**Producers of electricity from renewable energy sources**											
	Number						**Total installed capacity in MW**					
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Wind power plants	60	64	66	67	67	66	2 953	2 810	2 932	2 963	2 962	2 961
Hydro power	69	100	104	103	103	102	263	295	314	348	342	341

plants, equal to or less than 10 MW[1]												
Biomass plants	14	14	25	28	28	28	66	81	107	124	124	124
Photovoltaic plants	370	403	514	577	576	576	1 124	1 217	1 296	1 360	1 359	1 359

NOTE: [1] including high-efficiency cogeneration, landfill gas, sewage treatment plant gas

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

The total installed electrical capacity in units accredited for production of electricity from renewable sources at the end of 2017 and 2018, respectively, was 4 787 MW and 4 785 MW, falling below the values in 2016, with electrical capacities for which the accreditation period has expired **(Figure 3.1).**



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacităţi instalate in centrale electrice care au beneficiat de sistemul de promovare a E-SRE [MW]	21	21	52	75	99	561	1226	2298	4349	4450	4662	4795	4787	4785
Producţia de E-SRE care a beneficiat de sistemul de promovare a E-SRE [GWh]	8	23	43	132	242	677	1510	3365	6279	7859	8118	8735	9369	9082

RO	***EN***
Capacități instalate în centrale electrice care au beneficiat de sistemul de promovare a E-SRE [MW]	The installed capacity of power plants which benefitted from the E-RES promotion system [MW]
Producția de E-SRE care a beneficiat de sistemul de promovare a E-SRE [GWh]	Production of RES-E that benefited from the RES-E promotion system [GWh]

***Figure 3.1*: Trend in the installed electrical capacity of power plants which benefited from the system for promoting the production of electricity from renewable sources, and in the annual electricity produced in these plants for the period 2005-2018**

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

The overview of the total installed electrical capacity, by type of renewable energy source, at the end of 2017 and 2018, was: 62 % wind energy; 7 % hydropower; 28 % photovoltaic energy; 3 % biomass. The structure of the production of electricity from renewable energy sources (RES-E), which benefited from the 2017 promotion system, was: 67.9 % wind energy, 9.0 % hydropower, 4.9 % energy

produced in biomass plants, including landfill gas and sewage treatment plant gas, and 18.2 % solar energy. The structure of the RES-E production which benefited from the 2017 promotion system, was: 68.1% wind energy, 9.8% hydropower, 4.0% energy produced in biomass plants, including landfill gas and sewage treatment plant gas, and 18.1% solar energy.

The total production of electricity from renewable energy sources supported by the promotion system was: 1 510 TWh in 2011, 3 365 TWh in 2012, 6 279 TWh in 2013, 7 859 TWh in 2014, 8 118 TWh in 2015, 8 735 TWh in 2016, 9 369 TWh in 2017 and 9 082 TWh in 2018 (**Figure 3.1**).

Table 3.2 shows the structure of the production of RES-E in plants which benefited from the RES-E promotion system (for which green certificates were issued) and its corresponding capacities for 2017 and 2018.

***Table 3.2*: Structure of the production of RES-E in plants which benefited from the RES-E promotion system by type of source and its corresponding electrical capacity in 2017 and 2018.**

Type of source	2017		2018	
	Production of electricity, GWh	Installed capacity, MW	Production of electricity, GWh	Installed capacity, MW
Wind	6 358	2 962	6 182	2 961
Hydro	855	342	892	341
Solar power	1 702	1 359	1 648	1 359
Biomass	454	124	360	124

Source: Follow-up reports on the functioning of the system for promotion of electricity produced from renewable energy sources in 2017 and 2018, ANRE 2018, 2019

The green certificates market is a separate electricity market that operates under competitive supply and demand mechanisms for green certificates, where the green certificates for the RES-E covered by the system of RES-E promotion through green certificates are traded.

In **2017**, 20 177 614 GCs were issued for trading for the production of RES-E of 9 369 GWh, with the following breakdown by type of renewable source:

- 10 888 083 GCs for the electricity produced in wind power plants;
- 1 974 883 GCs for the electricity produced in hydropower plants with installed capacities of not more than 10 MW;
- 783 722 GCs for the electricity produced in biomass plants, including landfill gas and sewage treatment plant gas;
- 6 530 926 GCs for the electricity produced in photovoltaic power plants.

The share of GCs issued by TSOs by type of technology related to the production of RES-E for **2017** was the following: 53.96 % wind power plants, 32.37 % photovoltaic power plants, 9.79 % hydropower plants, 3.88 % biomass plants.

The electricity produced in **2017** in RES-E production units was 25 695 GWh (normalised value), of which 9 369 GWh benefited from the green certificates promotion system, the remaining 16 326 GWh

being produced in hydropower plants with installed capacity above 10 MW and in other RES-E production units which do not benefit from the support scheme.

The quantity of electricity of 25 695 GWh thus equated to a 42.3 % RES-E share in the total gross final consumption of electricity in Romania, and the quantity of electricity of 9 369 GWh, which benefited from the green certificates promotion system, equated to a 15 % share in the total gross final consumption of electricity in Romania.

Table 3.3 shows the comparison between the RES-E produced in **2017** (GWh) and supported by the GC promotion system and the RES-E projected in the NREAP (the RES-E produced).

***Table 3.3*: Electricity produced by type of renewable energy sources in 2017**

Type of RES-E	Achieved GWh	Projected in the NREAP GWh
Wind	6 358	7 668
Hydraulic	855	1 310
Biomass	454	2 600
Solar energy	1 702	246

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2017, ANRE 2018

When it established the annual quotas for purchase of green certificates for 2017, by 31 March 2018, ANRE considered the number of GCs issued on the basis of the information regarding the electricity produced from renewable energy sources for 2017 and the final electricity consumption for 2017.

As from its date of entry into force, Government Emergency Order No 24/2017 replaced the annual mandatory quota for the electricity produced from renewable energy sources, which benefits from the green certificates promotion system, by the annual static quantity of green certificates, which constitutes the sum of the total quantity of green certificates estimated to be issued by the end date of the support scheme in 2031 and the quantity of green certificates postponed from trading in the period 2013-2024, divided by the number of years remained until the expiry of the period of application of the green certificates promotion system.

The annual mandatory quota for purchase of green certificates for **2017** was:

- 0.210 GC/MWh for the period January-March 2017;
- 0.357 GC/MWh for the period April-December 2017.

The annual mandatory quota for purchase of green certificates for **2017** was 0.357 GC/MWh and the rate of achievement of the mandatory quota for purchase of GCs for this year was 99.99 %.
In 2018, 17 875 990 green certificates were issued for the production of RES-E of 9 082 GWh, of which 15 045 207 GCs were issued for trading and 2 830 783 GCs were postponed from trading for photovoltaic power plants.

The breakdown by type of renewable source for green certificates issued for trading is the following:

- 5 791 844 GCs for the electricity produced in wind power plants;

- 2 123 833 GCs for the electricity produced in hydropower plants with installed capacities of not more than 10 MW;
- 804 435 GCs for the electricity produced in biomass plants, including landfill gas and sewage treatment plant gas;
- 6 325 095 GCs for the electricity produced in photovoltaic power plants.

The share of GCs issued by TSOs by type of technology related to the production of RES-E for **2018** was the following: 39.0 % wind power plants, 42.07 % photovoltaic power plants, 14.0 % hydropower plants, 5.0 % biomass plants.

Table 3.4 shows the comparison between the RES-E produced in **2018** (GWh) and supported by the GC promotion system and the RES-E projected in the NREAP (the RES-E produced).

***Table 3.4*: Electricity produced by type of renewable energy source in 2018**

Type of RES-E	Achieved GWh	Projected in the NREAP GWh
Wind	6 182	8 020
Hydraulic	892	1 330
Biomass	360	2 720
Solar energy	1 648	271

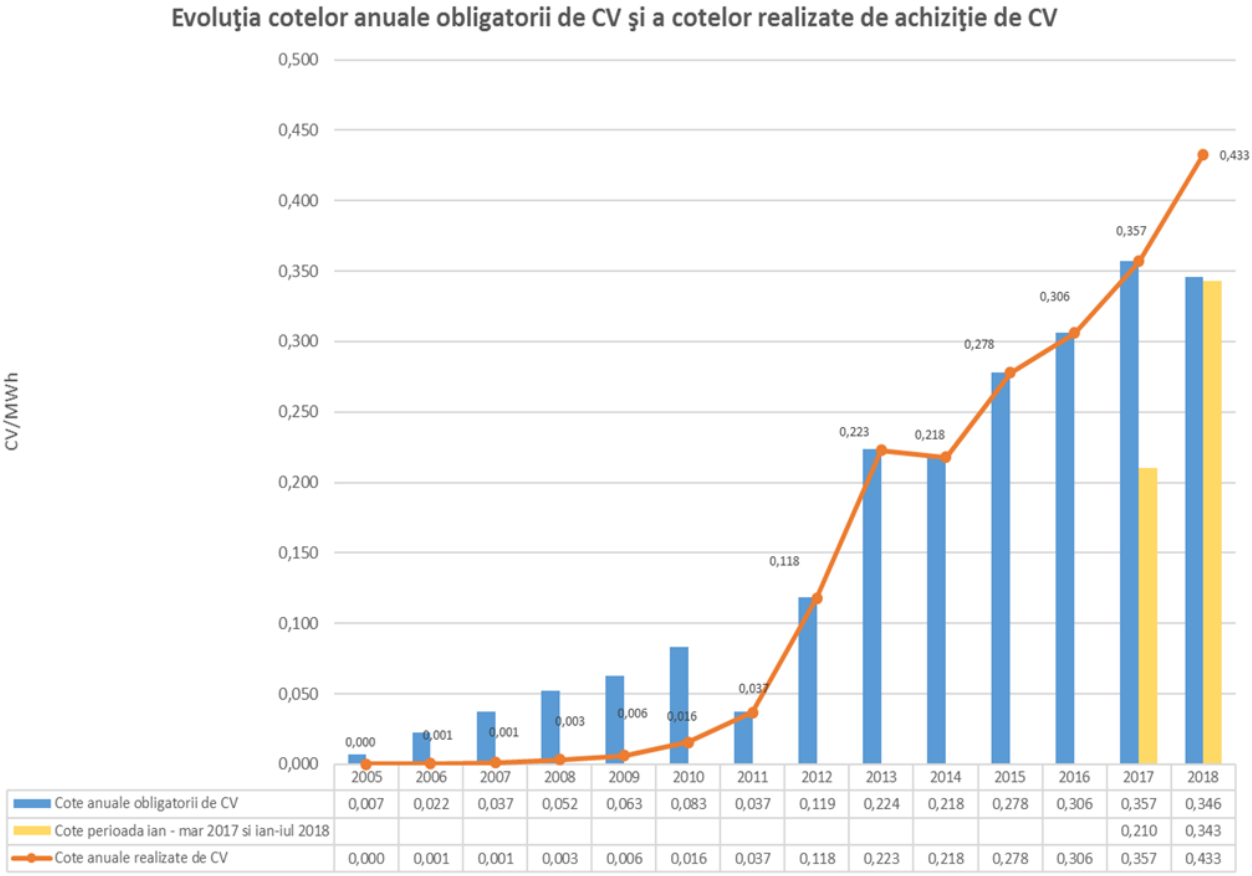
Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

When it established the annual quota for purchase of GCs for 2018, by 31 March 2016, ANRE considered the number of GCs issued on the basis of the information regarding the electricity produced from renewable energy sources for 2018 and the final electricity consumption for 2018, so that the average impact on the final customer is not more than EUR 11.7/MWh in 2018.

The annual mandatory quota for purchase of green certificates for **2018** was:

- 0.343 GC/MWh for the period January-July 2018;
- 0.433 GC/MWh for the period August-December 2018 with an achievement rate of 99.9 %.

Figure 3.2 shows the trend in the annual mandatory quotas of GCs and in the quotas of purchased GCs achieved by economic operators obliged to purchase green certificates, in the period 2015-2018.



RO	***EN***
Evoluția cotelor anuale obligatorii de CV și a cotelor realizate de achiziție de CV	The trend in the annual mandatory quotas of GCs and in the quotas of purchased GCs achieved
Cote anuale obligatorii de CV	Annual mandatory quotas of GCs
Cote perioada ian-mar 2017 și ian-iul 2018	Quotas for January-March 2017 and January-July 2018
Cote anuale realizate de CV	Annual quotas of GCs

***Figure 3.2*: Trend in the annual mandatory quotas of GCs and in the quotas of purchased GCs achieved in the period 2005-2018**

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

The green certificates market is a separate electricity market that operates under competitive supply and demand mechanisms.

Green certificates received by RES-E producers from TSOs are traded on the green certificates market and the validity of green certificates received by producers of RES-E by 31 March 2017 was 12 months. Starting from the first day of the month following the entry into force of Government Emergency Order No 24/2017, both green certificates issued for trading and green certificates postponed from trading as from 1 July 2013 are valid and will be tradable until 31 March 2032.

Green certificates issued by TSOs to producers of RES-E are traded on a competitive basis on the bilateral contracts market and/or on the centralised green certificates market only between RES-E producers as sellers and the suppliers to final consumers of electricity as buyers.

In **2017**, green certificates were traded on the green certificates market (GCM) by means of the two platforms:

- The Centralised Green Certificates Market (CGCM);
- The Green Certificates Bilateral Contracts Market (GCBCM);

and under the bilateral contracts negotiated directly, namely:

- Directly negotiated bilateral sales/purchase contracts concluded before the entry into force of Government Emergency Order No 57/2013 and Government Emergency Order No 24/2017 (DNBC);
- Directly negotiated bilateral sales/purchase contracts concluded in accordance with Law No 23/2014 (DNBC < 1 MW)

With effect from 1 September 2017, by the entry into force of the Regulation on the organisation and functioning of the green certificates market, as approved by Order No 77/2017 of ANRE, as subsequently amended and supplemented, the structure of the green certificates market (GCM) is composed of the following:

a. The green certificates bilateral contracts market (GCBCM) comprising:

- The centralised anonymous forward green certificates market (CFGCM)
- The directly negotiated green certificates bilateral contracts market (DN-GCBCM)

b. The centralised anonymous spot green certificates market (CSGCM)

In **2017**, the producers of RES-E with installed capacity below 1 MW transferred 595 707 GCs under directly negotiated bilateral sales/purchase contracts concluded in accordance with Law No 23/2014, which equates to approximately 4.4 % of the total transfers concluded in 2017 on GCM.

At the same time, the three major RES-E producers (ENEL Green Power Romania, CEZ Group Romania Group, EDP Group), which are beneficiaries of green certificates, transferred 4 421 798 GCs, which equates to approximately 33 % of total transfers concluded in 2017 on GCM.

Following the yearly increase in the number of green certificates available on the market, economic operators having the obligation to purchase green certificates were bound to purchase a GC for a smaller quantity of electricity supplied.

In the follow-up on the functioning of the green certificates market, ANRE monitors a set of indicators listed in the Methodology for monitoring the system of promotion of electricity from renewable energy sources through green certificates, as approved by Order No 52/2016 of the President of ANRE, as subsequently amended, in order to assess the development and operation of the green certificates market, the efficiency and the economic and environmental impact of the RES-E promotion system, and the means to achieve the national target committed to by Romania.

The ANRE follow-up reports on the functioning of the RES-E promotion system in **2017 and 2018** have revealed the following information on the monitored indicators:

a. Overview of the participants in the GCM

The participants in GCM may be: producers of RES-E, which benefit from the green certificates promotion system, electricity suppliers purchasing electricity for sale to final customers and for their own consumption, and electricity producers supplying their own consumption sites and/or customers connected to the plant bars.

In order to achieve the mandatory quota of green certificates for the analysis year 2017, transactions on GCM were also conducted in the first quarter of 2018. 949 participants were thus listed on GCM at the end of 2017 and they act both as electricity suppliers, or as producers supplying their own consumption sites and/or as consumers connected to the plant bars, and as RES-E producers. 230 economic operators/natural persons out of the 949 participants listed on GCM by the end of 2017 were required to purchase GCs for 2017 according to the electricity supplied to final consumers.

949 participants were listed on GCM at the end of 2018. 217 economic operators/natural persons out of the 949 participants listed on GCM were required to purchase GCs for 2018 according to the electricity supplied to final customers in order to achieve the mandatory quota of GCs for the analysis year 2018.
Table 3.5 shows the trend in the participants listed on the market and in the active participants per month in 2017 and 2018.

Table 3.5: **Participants listed/active on GCM in 2017 and 2018**

Year	Participants	Number per month											
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2017	Listed	913	923	933	939	948	949	940	940	941	950	949	949
	Active	195	227	243	212	195	188	205	184	110	257	262	268
2018	Listed	945	951	957	945	948	950	948	949	951	952	953	949
	Active	303	292	331	314	267	270	305	263	261	282	252	232

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

In **2017**, producers of electricity from renewable energy sources, which mainly hold wind power plants (Enel Green Power Romania with a 12 % share, CEZ Romania with a 11 % share, EDP Romania with a 10 % share, Verbund Renewable Power with a 3 % share), recorded significant market shares for GC beneficiaries and producers with an installed capacity below 1 MW recorded 6 %.

In **2018**, significant market shares were recorded by the following producers of electricity from renewable energy sources: CEZ Romania, which mainly holds wind power plants, recorded a 11 % share, Enel Green Power Romania recorded a 9 % share from wind and photovoltaic power plants, EDP Romania recorded a 7 % share from wind and photovoltaic power plants, and LJG Grup recorded a 4 % share from wind and photovoltaic power plants. All RES-E producers having an installed capacity below 3 MW recorded a market share of 18 %.

Table 3.6 shows the annual average values of the structure indicator C1 (the market share of the largest producer of RES-E, which is a beneficiary of GCs, as a percentage) and of the HHI indicator determined on the basis of the number of GCs issued to RES-E producers in the period 2005-2018.

Table 3.6: **Trend in the GCM indicators**

Year	The C1 market share in %	The HHI indicator
2005	94	8 931
2006	90	8 153
2007	39	2 407
2008	43	2 741
2009	41	2 620
2010	36	1 853
2011	41	1 927
2012	21	1 029
2013	18	908
2014	10	191
2015	10	237
2016	19	995
2017	12	434
2018	11	303

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

The value of the HHI indicator is 434 in **2017** and 303 in **2018**, below the threshold of 1 800, which separates markets with moderate market power concentration from those with excessive concentration.

b. The tendering level for GCs issued on the green certificates market

The tendering level for GCs is established based on:

- the production of RES-E which benefitted from the promotion system;
- the number of GCs issued overall and by type of RES;
- the market shares of electricity suppliers.

In **2017**, the RES-E promotion system was applied for the electricity output of 9 369 GWh, for which 24 138 919 GCs were issued, of which 20 177 614 GCs were issued for trading and 3 961 305 GCs were postponed from trading.

The statement of the GCs issued for trading by type of renewable energy source is the following: 53.96 % to producers from wind sources, 9.79 % to producers from hydropower sources, 32.37 % to producers from photovoltaic sources and 3.88 % to producers of biomass, including landfill power plants.

In **2018**, the RES-E promotion system was applied for the electricity output of 9 082 GWh, for which 17 875 990 GCs were issued, of which 15 045 207 GCs were issued for trading and 2 830 783 GCs were postponed from trading for photovoltaic power plants.

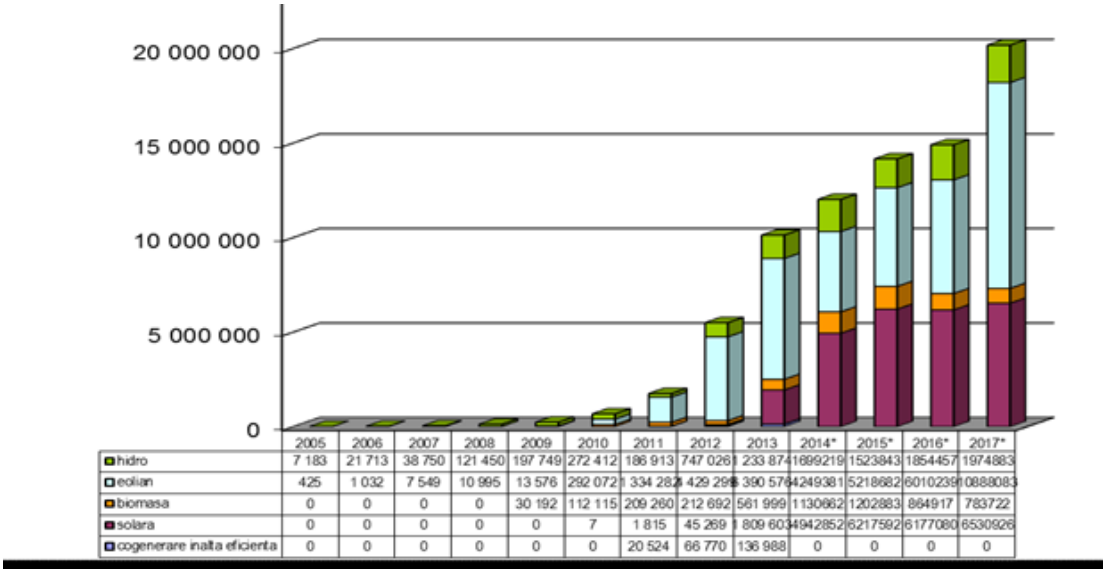
The breakdown by type of renewable source for green certificates issued for trading is the following:

- 5 791 844 GCs for the electricity produced in wind power plants;
- 2 123 833 GCs for the electricity produced in hydropower plants with installed capacities of not more than 10 MW;

- 804 435 GCs for the electricity produced in biomass plants, including landfill gas and sewage treatment plant gas;
- 6 325 095 GCs for the electricity produced in photovoltaic power plants.

The statement of the GCs issued for trading by type of renewable energy source is the following: 39% to producers from wind sources, 14% to producers from hydropower sources, 42% to producers from photovoltaic sources and 5% to producers of biomass, including landfill power plants.

Figure 3.3 shows the annual trend in the number of GCs issued by TSOs (CN Transelectrica SA) to apply the RES-E promotion system by type of technology in the period 2005-2017.



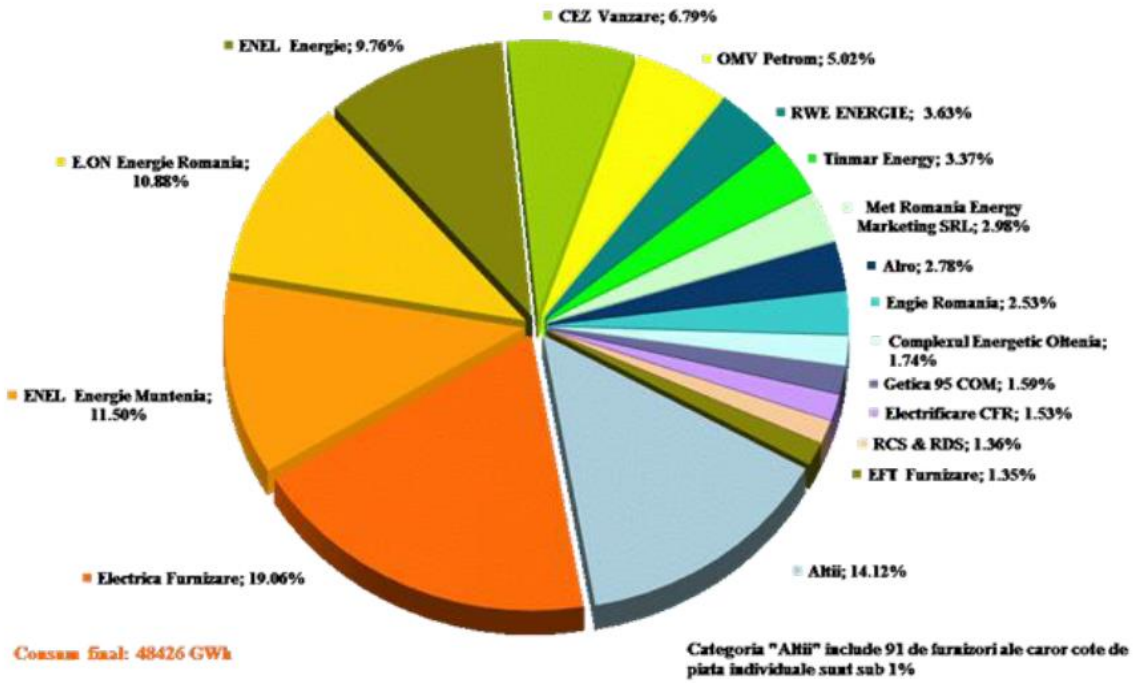
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015*	2016*	2017*
hidro	7 183	21 713	38 750	121 450	197 749	272 412	186 913	747 026	233 874	1699219	1523843	1854457	1974883
eolian	425	1 032	7 549	10 995	13 576	292 072	334 282	429 298	390 576	4249381	5218682	6010239	6888083
biomasa	0	0	0	0	30 192	112 115	209 260	212 692	561 999	1130882	1202883	864917	783722
solara	0	0	0	0	0	7	1 815	45 269	1 809 603	4942852	6217592	6177080	6530926
cogenerare inalta eficienta	0	0	0	0	0	0	20 524	66 770	136 988	0	0	0	0

RO	***EN***
Hidro	Hydro
Eolian	Wind
Biomasa	Biomass
Solara	Solar
Cogenerare înaltă eficiență	High-efficiency cogeneration

Figure 3.3: **Annual trend in the number of GCs issued by TSOs to RES-E producers in the period 2005-2017**
Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2017, ANRE 2018

The market shares of electricity suppliers for the energy supplied to final customers in 2017 and 2018 are listed in **Figures 3.4 and 3.5**.

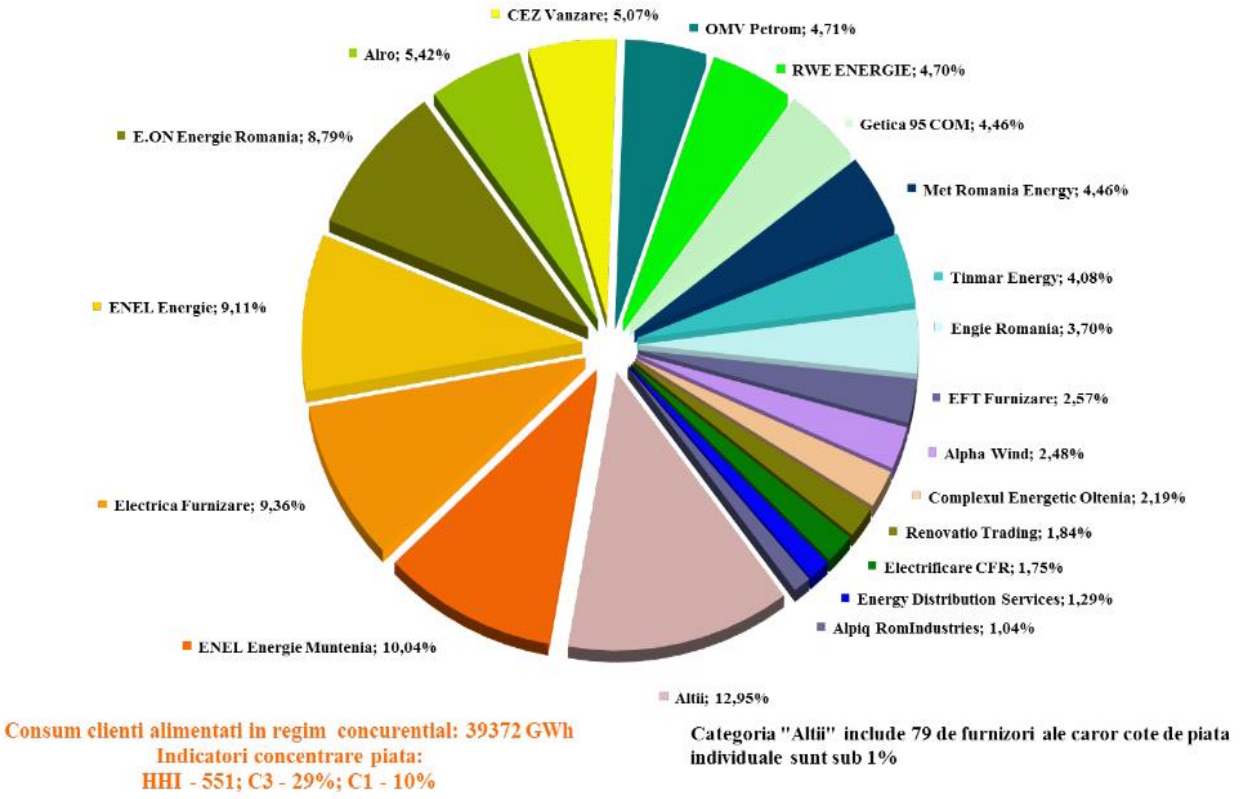
The annual mandatory quota for purchase of GCs, as established by ANRE, represents the number of GCs that a supplier is obliged to purchase for each MWh of electricity it sells to final consumers and is determined as the ratio between the total number of green certificates issued and the final electricity consumption achieved in the analysis year.



RO	***EN***
Consum final:	Final consumption:
Categoria „Altii” include 91 de furnizori ale căror cote de piață individuale sunt sub 1%	The “Other” category includes 91 suppliers whose individual market shares are below 1 %
Altii:	Other:

Figure 3.4: **Market shares of electricity suppliers for final customers - 2017**
Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2017, ANRE 2018

In accordance with the legal provisions, the annual mandatory quota of electricity produced from renewable energy sources, which benefits from the GC promotion system under Government Decision No 1014/2016, was set to 8.3 % of the gross final consumption of electricity for **2017**.
The number of GCs required to be purchased in order to achieve the GC quota in **2017** was 13 541 011 GCs.



RO	***EN***
Consum clienți alimentați în regim concurențial:	Consumption per customers supplied on a competitive basis:
Indicatori concentrare piață:	Market concentration indicators:
Categoria „Altii” include 79 de furnizori ale căror cote de piață individuale sunt sub 1%	The “Other” category includes 79 suppliers whose individual market shares are below 1 %
Altii:	Other:

Figure 3.5: **Market shares of electricity suppliers for final customers - 2018**
Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

When it established the GC purchase quotas, by 31 March 2019, ANRE considered the number of GCs issued on the basis of the information regarding the electricity produced from renewable energy sources for 2018 and the final electricity consumption for 2018.

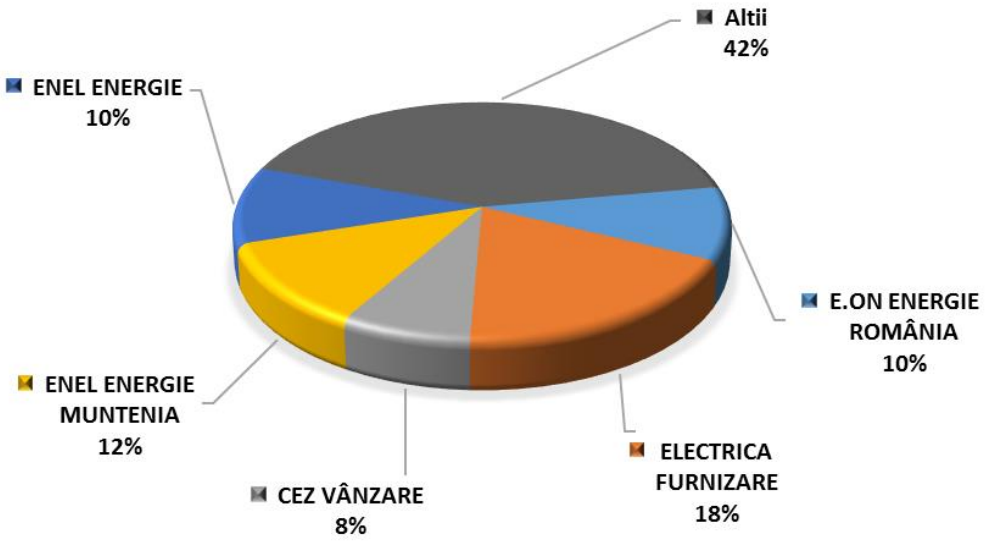
As from the date of entry into force of GEO No 24/2017, ANRE has calculated the annual static quantity of green certificates under Order No 78/2017 of ANRE, which represents the total quantity of green certificates estimated to be issued by the end date of the support scheme in 2031 and the quantity of green certificates postponed from trading in the period 2013-2024, divided by the number of years remained until the expiry of the period of application of the green certificate promotion system.

With the entry into force of Law No 184/2018, ANRE established the mandatory quota for purchase of GCs for 2018, as follows:

a) for January-July 2018, the value of the annual mandatory quota for purchase of green certificates was 0.343 GCs/MWh and was set on the basis of the static quantity of GCs for the specified period and of the final electricity consumption, from which the excepted final electricity consumption in that period is deducted, without exceeding the average impact of EUR 11.1/MWh on the customer;
b) for August-December 2018, the value of the annual mandatory quota for purchase of green certificates was 0.433 GCs/MWh and was set on the basis of the number of green certificates sustained by the green certificates promotion system in the specified period, and of the final electricity consumption, from which the excepted final electricity consumption in that period is deducted, being determined so that the average impact on the customer for 2018 would not be more than EUR 11.7/MWh.

The total number of green certificates required to be purchased by economic operators having an obligation to purchase GCs in order to achieve their annual mandatory quota, was 16 586 305 GCs, as determined on the basis of the annual quota for purchase of GCs for 2018 and of the quantity of electricity supplied by them to final customers, less the amount of excepted electricity of approximately 43.7 TWh.

Figure 3.6 shows the rate of the GCs required to be purchased by the main economic operators having an obligation to purchase GCs in the total number of GCs afferent to the annual obligation to purchase GCs for 2018.



RO	*EN*
Altii	Other

Figure 3.6: **Rate of GCs required to be purchased by economic operators having a purchasing obligation in 2018**
Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

c. Number of GCs available on the green certificates market in order to achieve the mandatory quota for purchase of GCs for 2017 and 2018

The number of GCs available on the green certificates market in order to achieve the mandatory quota for purchase of GCs for **2017** was determined on the basis of:

- the number of GCs issued for trading in 2017;
- the number of GCs issued for trading in the first two months of 2018.

In order to achieve the mandatory quota for purchase of GCs for 2017, at least 22 610 238 GCs were available, of which:

- 20 177 614 GCs were issued for trading for 2017;
- 2 432 624 GCs issued for trading in February and March 2018, for the electricity afferent to January and February 2018.

The number of GCs available on the green certificates market in order to achieve the mandatory quota for purchase of GCs for **2018** was determined on the basis of:

- the number of GCs issued for trading in 2018;
- the number of GCs issued for trading in the first two months of 2019;
- the number of GCs recovered from the postponed GCs for the electricity produced in wind power plants and hydropower plants, which were issued for trading in 2018;
- the number of GCs recovered from the postponed GCs for the electricity produced in wind power plants and hydropower plants, which were issued for trading in January and February 2019;
- the number of the remaining GCs in the producers' account, in excess of the quota obligation for 2017.

In order to achieve the mandatory quota for purchase of GCs for **2018**, at least 28 489 076 GCs were available, of which:

- 15 045 207 GCs were issued for trading for 2018;
- 2 132 436 GCs were recovered from the postponed GCs for the electricity produced in wind power plants and hydropower plants, for trading in 2018;
- 2 288 484 GCs issued for trading in February and March 2019, for the electricity afferent to January and February 2019.
- 355 406 GCs were recovered from the postponed GCs for the electricity produced in wind power plants and hydropower plants in January, February and March 2019;
- 8 667 543 GCs in excess of the obligation to purchase GCs for 2017 (the number of remaining 9 049 645 GCs in the producers' account in excess of the obligation to purchase GCs for 2017 as per the *Follow-up report on the functioning of the system for promotion of electricity from renewable energy sources in 2018* was reduced by the 382 102 cancelled GCs, which corresponds to the number of green certificates issued between 1 January 2017 and 31 March 2017, which were not traded and which had a 12-month validity period).

d. The selling rate for the GCs available on the green certificates market in 2017 and 2018

The selling rate for the GCs available on the green certificates market in 2017 and 2018 was determined on the basis of:

- the number of GCs tendered/sold on GCM by RES-E producers;
- the number of GCs consumed to achieve the 2017/2018 quota;
- the number of GCs cancelled in 2017/2018 due to the expiry of the validity period;

- the number of remaining valid GCs for the following year.

In 2017 and 2018, GCs were traded on the green certificates market (GCM), which is composed of the following:
i. The centralised anonymous spot green certificates market (CSGCM);
ii. The green certificates bilateral contracts market (GCBCM) comprising:

- the centralised anonymous forward green certificates market (CFGCM);
- the directly negotiated green certificates bilateral contracts market (DN-GCBCM).

Green certificates are transferred by the green certificates market operator (GCMO) from the account of sellers (producers) to the account of buyers (suppliers) after they have received acknowledgment of receipt from the sellers involved in those transactions, being detailed as follows:

- The directly negotiated green certificates bilateral contracts market (GCBCM)
  - The centralised anonymous forward green certificates market (CFGCM)
  - The directly negotiated green certificates bilateral contracts market (DN-GCBCM)
- The centralised anonymous spot green certificates market (CSGCM).

In **2017**, economic operators having an obligation to purchase GCs were obliged to purchase 13 541 011 GCs of the total 22 610 233 GCs available, with 13 GCs left untraded. A number of valid 9 049 645 GCs remained in excess of the annual quota obligation. In 2017, 953 360 GCs were cancelled from the economic operators' account following the expiry of the validity period.

In **2018**, 13 656 977 GCs were traded on GCM, of which 11 057 829 on the bilateral contracts market and 2 599 148 on the centralised anonymous spot green certificates market.
In 2018, 13 784 866 GCs were traded on GCM, of which 10 810 436 on the bilateral contracts market and 2 599 430 on the centralised anonymous spot green certificates market.
In 2018, the producers of RES-E transferred 10 741 214 GCs under directly negotiated bilateral sale/purchase contracts concluded on the centralised bilateral contracts market under Law No 23/2014, as subsequently amended and supplemented, and under directly negotiated bilateral sales/purchase contracts concluded before the entry into force of Government Emergency Order No 57/2013, which equates to approximately 77.92 % of the total green certificates transferred in 2018 on GCM.

The economic operators having an obligation to purchase GCs for 2018 were obliged to purchase 16 586 305 GCs of the total 28 871 178 GCs available, with 15 090 GCs left untraded. A number of valid 11 902 771 GCs has remained in excess of the annual quota obligation.
A number of 382 102 GCs were cancelled in 2018, which corresponds to the number of green certificates issued from 1 January 2017 to 31 March 2017, which were not traded and which had a 12-month validity period.

e. Trading price for GCs on GCM in 2017 and 2018

In **2017**, green certificates were traded on:

- the centralised green certificates market (CGCM) until 31 August 2017 at a weighted average price of RON 132.54/GC, i.e. EUR 29.42/GC;
- the green certificates bilateral contracts market (GCBCM) until 31 August 2017 at an arithmetic average price of RON 132.41/GC, i.e. EUR 29.42/GC;

- the centralised anonymous spot green certificates market (CSGCM) starting with 1 September 2017 at a weighted average price of RON 132.03/GC, i.e. EUR 29.40/GC;
- the centralised anonymous forward green certificates market (CFGCM) starting with 1 September 2017 at a weighted average price of RON 132.03/GC, i.e. EUR 29.40/GC.

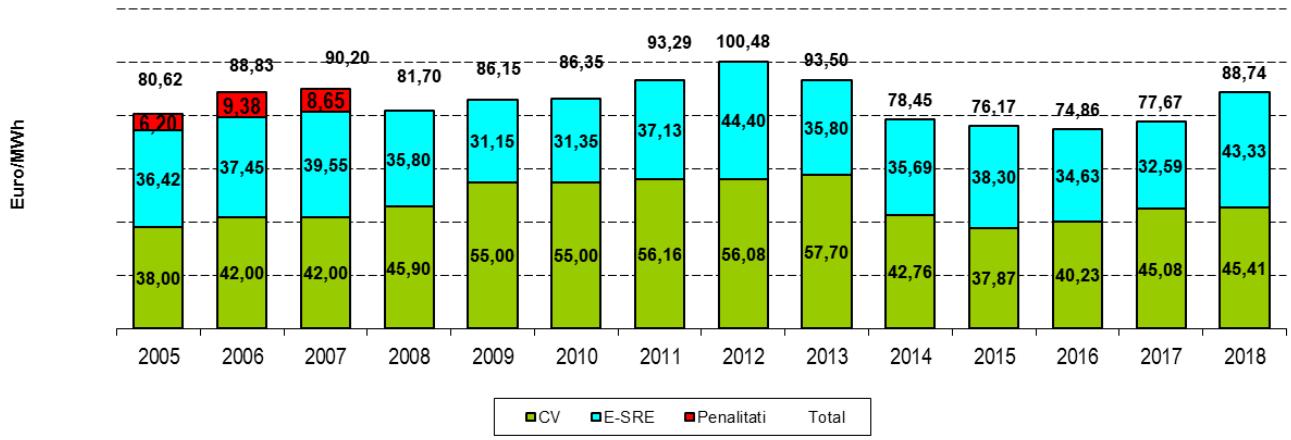
In **2018**, green certificates were traded on:

- the directly negotiated green certificates bilateral contracts market (DN-GCBCM) at a weighted average price of RON 134.07/GC;
- the green certificates bilateral contracts market (GCBCM) at a weighted average price of RON 134.18/GC;
- the centralised anonymous spot green certificates market (CSGCM) at a weighted average price of RON 134.31/GC;
- the centralised anonymous forward green certificates market (CFGCM) at a weighted average price of RON 134.31/GC.

f. The single revenue of the RES-E producer

The average value of the single revenue of the producer which benefited from the promotion system in **2017** was EUR 77.67/MWh and RON 354.85/MWh (calculated at the average exchange rate of RON 4.5682/EUR, as established by the National Bank of Romania). The average value of the single revenue of the producer which benefited from the promotion system in **2018** was EUR 88.74/MWh and RON 412.92/MWh (calculated at the average exchange rate of RON 4.6534/EUR, as established by the National Bank of Romania).

Figure 3.7 shows the trend in the single revenue achieved by RES-E producers in the period 2005-2018.



RO	***EN***
Euro/MWh	EUR/MWh
Penalități	Penalties
CV	GC
E-SRE	RES-E
Total	Total

Figure 3.7: **Trend in the single revenue of RES-E producers in the period 2005-2018**

Source: Follow-up report on the functioning of the system for promotion of electricity produced from renewable sources in 2018, ANRE 2019

The RES-E price in the period 2005-2009 was the price adjusted under an Order of the President of ANRE.
The RES-E price in the period 2010-2018 was calculated as the average RES-E price for sale by RES-E producers.

g. Rate of achievement of the annual mandatory quota for purchase of GCs

The rate of achievement of the annual mandatory quota for purchase of GCs was set in 2017 and 2018 based on:

- the number of GCs required to be purchased by economic operators having an obligation to purchase GCs in 2017/2018;
- the number of GCs not purchased by economic operators having an obligation to purchase GCs;
- the number of GCs consumed by economic operators having an obligation to purchase GCs in order to achieve the quota in 2017/2018;
- the number of GCs transferred from the RES-E producer's account to the supplier's account.

In **2017**, 230 electricity suppliers/producers having an obligation to purchase green certificates based on the electricity supplied to final consumers were obliged to purchase green certificates. Eight of these suppliers/producers having an obligation to purchase green certificates did not achieve their mandatory quota of GCs, which means that 13 GCs were not purchased. The rate of achievement of the mandatory quota for purchase of green certificates for 2017 was 99.99 %.

In **2018**, 217 electricity suppliers/producers having an obligation to purchase green certificates based on the electricity supplied to final consumers were obliged to purchase green certificates. 19 of these suppliers/producers having an obligation to purchase green certificates did not achieve their mandatory quota of GCs, which means that 15 090 GCs were not purchased. The rate of achievement of the mandatory quota for purchase of green certificates for 2018 was 99.90%.

The value of an unpurchased green certificate was:

- RON 319.774/GC, i.e. EUR 70/GC, in **2017** (calculated at the average exchange rate of RON 4.5682/EUR, as established by the National Bank of Romania), in accordance with Government Emergency Order No 24/2017 amending Law No 220/2008 establishing the system for promoting the production of energy from renewable sources and amending certain rules;
- RON 325.775/GC, i.e. EUR 70/GC, in **2018** (calculated at the average exchange rate of RON 4.6535/EUR, as established by the National Bank of Romania), in accordance with Government Emergency Order No 24/2017 amending Law No 220/2008 establishing the system for promoting the production of energy from renewable sources and amending certain rules;

The amount resulting from the collection of the value of green certificates not purchased, namely,

- RON 4 157.062 in 2017, which is below that in 2016, when it was RON 25.23 million,
- and RON 4 915.9 in 2018, which is above that in 2017,

constitutes revenue to the Environmental Fund under the law, in order for natural persons investing in energy facilities with an installed capacity of up to 100 kW to finance the production of energy from renewable sources.

h. Financial effort for the promotion of RES-E

The amount of the State aid reported by RES-E producers from the sale of GCs for 2017 and 2018 was EUR 1 666 million, i.e. RON 1 834 million.

Table 3.3 shows the amount of the State aid from the sale of GCs per technology category in 2017 and 2018.

Table 3.3: **State aid amount in 2017 and 2018 (RON million)**

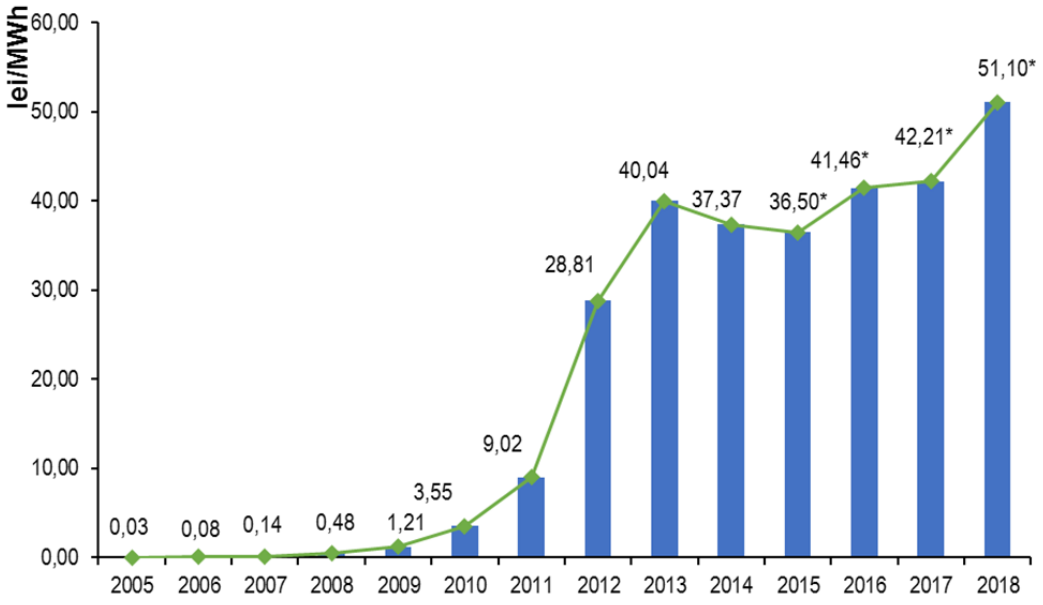
Type of RES-E	State aid amount	
	2017	**2018**
Wind energy	732	413
Hydropower	203	274
Biomass	63	69
Solar energy	668	1 078

Source: Follow-up report on the functioning of the system for promotion of electricity from renewable sources - ANRE 2018, 2019

i. The impact of the GC on the electricity price

The impact on the final customer's bill in the period January-December 2017 and 2018 was RON 42.21/MWh and RON 51.1/MWh respectively.

The trend in the impact of the implementation of the RES-E promotion system on the electricity price at the final customer for the period 2005-2018 is shown in **Figure 3.8**.



RO	***EN***
2015 – Impactul tine seama de un consum exceptat in anul 2015 de cca 3,45 TWh	2015 – The impact takes into account exempted consumption of approximately 3.45 TWh in 2015
2016 – Impactul tine seama de un consum exceptat in anul 2015 de cca 6,85 TWh	2016 – The impact takes into account exempted consumption of approximately 6.85 TWh in 2015
2017 – Impactul tine seama de un consum exceptat in anul 2015 de cca 7,208 TWh	2017 – The impact takes into account exempted consumption of approximately 7.208 TWh in 2015
2018 – Impactul tine seama de un consum exceptat in anul 2015 de cca 7,496 TWh	2018 – The impact takes into account exempted consumption of approximately 7.496 TWh in 2015

Lei	RON

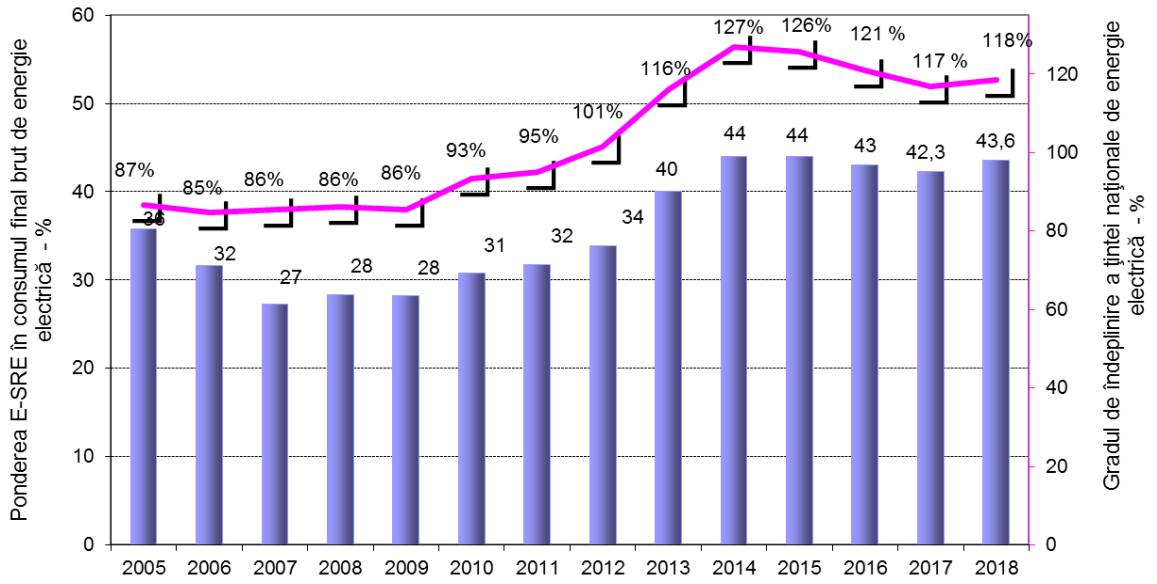
Figure 3.8: **Trend in the impact of the implementation of the RES-E promotion system on the electricity price at the final customer for the period 2005-2018**

Source: Follow-up report on the functioning of the system for promotion of electricity from renewable sources; ANRE 2018, 2019

The electricity produced in 2018 in RES-E production units was 26 939 GWh (normalised value), of which 9 082 GWh benefited from the green certificates promotion system, and the remaining 17 857 GWh was produced in hydropower plants with installed capacity above 10 MW and in other RES-E production units which do not benefit from the support scheme, which resulted in a RES-E share of 43.6 % in the total gross final consumption of electricity in Romania.

Moreover, the quantity of electricity of 9 082 GWh which benefited from the green certificate promotion system led to the achievement of a 15 % share in the total gross final consumption of electricity in Romania.

The trend in the share of electricity from renewable sources in the gross final consumption of electricity for Romania in the period 2005-2018 is shown in **Figure 3.9.**



RO	***EN***
Ponderea E-SRE în consumul final brut de energie electrică - %	Share of RES-E in the gross final energy consumption - %
Gradul de îndeplinire a țintei naționale de energie electrică - %	The rate of achievement of the national electricity target - %

Figure 3.9: **Rate of achievement of the national target for the RES-E share in the period 2005-2018**

Source: Follow-up report on the functioning of the system for promotion of electricity from renewable sources; ANRE 2018, 2019

In the context of the provision in Article 4 of Law No 220/2008, the national targets for the share of electricity produced from renewable energy sources in the gross final consumption of electricity, as projected for 2010, 2015 and 2020, are 33 %, 35 % and 38 % respectively. As shown in **Figure 3.9**, ANRE presents in the Follow-up report on the functioning of the system for promotion of electricity from renewable energy sources in 2018, the rate of achievement of the national target for the period 2005-2010, by comparing the value achieved in the analysis year with that of the legally established national target, because afterwards, from 2010 onward, the rate of achievement of the targets was assessed by comparing the achieved share of electricity produced from renewable sources in the gross final consumption of electricity in Romania with the annual values resulting from the interpolation between the legally established national targets for the period 2010-2018.

For 2018, the rate of achievement of the national target for the share of electricity from renewable energy sources in the gross final consumption of electricity was 118 %.

The analysis of the trend in the share of electricity produced from renewable sources in the gross final consumption of electricity has revealed that, from 2014 onward, the achieved target values have been approximately 44 %, which is above the 38 % set for 2020.

A. Programmes financing projects for harnessing renewable energy sources

The Ministry of European Funds envisages the achievement of the thematic objectives related to the harnessing of renewable energy sources in the period 2014-2020 in the framework of the Large Infrastructure Operational Programme (LIOP).

The **Large Infrastructure Operational Programme (LIOP)** was developed in order to meet the development needs of Romania, as identified in the 2014-2020 Partnership Agreement and in accordance with the Common Strategic Framework and the Position Paper of the Commission Staff. The LIOP strategy was aimed at the objectives of the Europa 2020 Strategy, in correlation with the National Reform Programme and with the Specific Country Recommendations, focusing on sustainable growth through the promotion of a low carbon economy, by energy efficiency measures and measures for promoting green energy, and by promoting environmentally friendly modes of transport and a more efficient use of resources.

LIOP finances activities in four sectors: the transport infrastructure, environmental protection, risk management and adaptation to climate changes, energy and energy efficiency, contributing to the EU Strategy for smart, sustainable and inclusive growth.

The LIOP benefits from a financial allocation of approximately EUR 11.8 billion, of which:

- EUR 6.94 billion from the ROP Cohesion Fund
- EUR 2.48 billion from the European Regional Development Fund
- EUR 2.46 billion from co-funding

There are two priority axes under this programme, which fund projects for harnessing renewable energy sources. These priority axes (PA) are:

- **PA6 - Promoting clean energy and energy efficiency to support a low carbon economy (allocated amount** - EUR 197 329 787, works contracts with the value of EUR 25 million were concluded by 2019);

- **PA8 - Smart and sustainable electricity and gas transmission systems** (allocated amount - EUR 68 026 596, works contracts of EUR 46 million were concluded by 2019).

The following specific objectives are provided under PA6 for financing projects for harnessing renewable energy resources:

- **SO 6.1 Increasing production of energy from less exploited renewable resources (biomass, biogas, geothermal);**
- **SO 6.4 Increasing savings in the primary energy consumption produced from high-efficiency cogeneration.**

The action lines under SO 6.1 are:

- Developing and/or upgrading the capacities producing electricity and/or heat from biomass and biogas;
- Developing and upgrading the facilities producing heat from geothermal energy;
- supporting investments in extension and upgrading works to electricity distribution networks with the purpose of taking over the energy produced from renewable resources under conditions of safety in the operation of NES.

The SO 6.4 action line is to develop/upgrade the high-efficiency cogeneration units (maximum 8 MWe) on natural gas and biomass at undertaking level.

PA8 includes the specific objective **SO 8.1 Increase in the capacity of the National Energy System to take over the energy produced from renewable resources.** The action line of this objective is to develop and/or upgrade the electricity transmission networks (aerial electrical lines and stations).

The Regional Operational Programme (ROP) 2014-2020 is the successor of the Regional Operational Programme 2007-2013 and one of the programmes under which Romania accesses European structural and investment funds from the European Regional Development Fund (ERDF) in the period 2014-2020. The Regional Operational Programme (ROP) 2014-2020, managed by the Ministry of Regional Development and Public Administration as the Managing Authority, was adopted by the European Commission (EC) on 23 June 2015.

The strategic vision regarding the development needs that ROP 2014-2020 should meet is based on the assessment of the economic and social situation of the regions in Romania (in the National Regional Development Strategy for 2014-2020).

The action lines are linked to the strategic action lines laid down by the European Commission as regards funding from the European Structural and Investment Funds through the European Regional Development Fund 2014-2020:

- innovation and research;
- the Digital Agenda;
- support for small and medium-sized enterprises (SMEs);
- low carbon economy.

The overall objective proposed by ROP 2014–2020 is to enhance the economic competitiveness and to improve the living conditions of local and regional communities by supporting the development of the business environment, infrastructure and services, for the sustainable development of regions, so that

they are able to manage themselves their resources effectively and to tap their potential of innovation and assimilation of technological development.

These objectives are translated into 11 priority axes (plus a technical assistance axis) with a total estimated allocation of EUR 8.25 billion, of which EUR 6.7 billion equating to the EU support through the European Regional Development Fund (ERDF) and EUR 1.5 billion equating to national contribution.

The following priority axes are provided under the ROP for funding projects that concern the promotion of renewable energy resources, namely:

- **PA3 - Supporting increase in the energy efficiency of public buildings** (allocated amount - EUR 2 374.57 million);
- **PA4 - Sustainable urban development** (allocated amount - EUR 1 386.86).

These priority axes finance the purchase of eco-friendly cars for urban transport and eco-friendly cars for institutions and individuals.

The National Rural Development Programme 2014-2020 includes measures supporting renewable energy projects. These measures are:

- **Measure 4 "Investments in physical assets"**, which also support, inter alia, investments in installations for the production of electricity and/or heat through the use of biomass. The total financial allocation for the period 2014-2020 is EUR 2.4 billion;
- **Measure 6 "Development of holdings and undertakings"**, which support investments in the production of biomass fuels.

Measure 4 comprises:

- Sub-measure 4.1a - Investments in fruit tree plantations with one of the following objectives: Improving the efficiency of production costs by promoting the production and use of energy from renewable sources on the farm and by reducing energy consumption;
- Sub-measure 4.2 - Support for investment in the processing/marketing of agricultural products with one of the following objectives: promoting investments for the production and use of energy from renewable sources (solar, wind, geothermal) and of energy generated using heat pumps.
- Sub-measure 4.2a - Investments in the processing/marketing of fruit tree plant products with one of the following objectives: Production and use of energy from renewable sources in own establishment.

Measure 6 comprises Sub-measures 6.2 "Support for establishment of non-agricultural businesses in rural areas" and 6.4 "Investments in the creation and development of non-agricultural activities" which finance investments for the production of biomass fuel (e.g.: production of wood pellets and briquettes) for the marketing, production and use of energy from renewable sources in order to conduct their own business. The financial allocation for Sub-measure 6.2 is EUR 117.8 million and for Measure 6.4 it is EUR 152.6 million.

Support is provided under Sub-measure 8.1 "Afforestation and creation of woodland" for afforestation of agricultural and non-agricultural lands. The species eligible for afforestation include acacia and

three willow species: the white willow, the sallow, and the crack willow. This sub-measure benefits from a financial allocation of approximately EUR 124.5 million.

The Ministry of Agriculture and Rural Development supports, through its policies, the development of agriculture and energy crops under the legal framework conferred by the Common Agricultural Policy. As with the other crops (wheat, maize, sunflower etc.), energy crops are eligible both under direct payment schemes from European funds and under the national transitional aid scheme financed from the national budget. The amount of such payments per hectare is established annually under a Government decision, after determining the areas eligible for payment by the Paying and Intervention Agency for Agriculture by the end of March each year. From the same national budget, non-food plant growers are reimbursed for the difference between the standard excise duty and the reduced excise duty of EUR 21/1 000 litres of diesel.

The Environmental Fund established in accordance with the "polluter pays" and "the manufacturer's responsibility" principles finances investments that aim at encouraging the use of renewable energy resources. The following programmes were thus implemented in 2017 and 2018:

- replacing heating systems using renewable energy, including replacing or completing classical heating systems - natural and legal persons;
- increasing the production of energy from renewable sources;
- the Programme for fostering the renewal of the National Vehicle Fleet;
- the promotion of clean and energy-efficient road transport vehicles.

The **"RO06 Renewable Energy - Rodine" Programme** financed under the EEA Grants 2009-2014 came to an end in 2017. The programme aimed at achieving the sustainable use of natural resources and at reducing greenhouse gas emissions by harnessing renewable energy sources, i.e. the hydropower and geothermal potential. Six projects totalling EUR 6.3 million have been completed under the programme.

C. Table 3 shows the amounts used in 2017 and 2018 to support the promotion of energy from renewable sources.

Table 3: **Support schemes for renewable energy sources**

RES support schemes in 2017			**Support per unit**	**Total (million EUR)**
A. The mandatory quota system combined with trading in Green Certificates	Obligation/quota (%)	99.99	EUR 77.67/MWh electricity produced. The support was granted for 9 369 TWh	EUR 727.69 million
	Certified average price in EUR/GC: EUR 29.42/GC on CGCM by 31 August EUR 29.45/GC on GCBCM by 31 August EUR 29.40/GC on CSGCM from 1			

	September EUR 29.40/GC on CFGCM from 1 September			
	Penalty EUR 70/GC not purchased			EUR 970
B. LIOP, PA 6 SO 6.1	Grants for investments in extension and upgrading works to electricity distribution networks with the purpose of taking over the energy produced from renewable resources under conditions of safety in the operation of NES			EUR 2.757 million
C Programme financed from the Environmental Fund				EUR 13.2 million
C1 Programme for increasing production of electricity from RES				EUR 1.9 million
C2 Programme for the installation of heating systems using renewable energy, including the replacement or completion of classical heating systems (the "Casa Verde" Programme - natural persons)			- RON 6 000 (approximately EUR 1 400)/applicant for solar panels and thermal power plants on biomass - RON 8 000 (approximately EUR 1 860)/applicant for heat pumps	EUR 2.7 million
C3 Programme for the installation of heating systems using renewable energy, including the replacement or completion of classical heating systems - beneficiaries are the administrative territorial unit, public institutions and the religious establishment			- RON 4 000 000 for administrative-territorial units with population of more than 100 000; - RON 3 000 000 for administrative-territorial units with population between 50 000 and 100 000; - RON 2 000 000 for administrative-territorial units with population between 20 000 and 50 000; - RON 1 000 000 for administrative-territorial units with population between 3 000 and 20 000; - RON 500 000 for	EUR 0.1 million

			administrative-territorial units with population below 3 000.	
C.4 The "Rabla" Programme			The amount of the discarding bonus is 6 500 lei, which is supplemented by an eco-bonus of - RON 1 500 (approximately EUR 300) when purchasing a new motor vehicle with a hybrid propulsion system; - RON 2 500 (approximately EUR 500) when purchasing a new motor vehicle with a hybrid electric vehicle.	EUR 2.2 million
C.5 The Rodine Programme	Harnessing renewable energy, namely the hydropower and geothermal potential.			EUR 6.3 million
D. MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (MADR) 2014-2020 M1, M2, M6	Grants for the use of RES, waste, residues and other raw materials for the purposes of the bioeconomy			EUR 0.391 million
Total annual estimated support in the electricity sector				EUR 738.65 million
Total annual estimated support in the heating sector				EUR 3.19 million
Total annual estimated support in the transportation sector				EUR 2.2 million
RES support schemes in 2018			**Support per unit**	**Total (million EUR)**
A. System of mandatory quotas combined with trading in green certificates	Obligation/quota (%)	99.90	EUR 88.74/MWh electricity produced. The support was granted for 9 082 TWh	EUR 805.94 million
	Certified average price in EUR/GC: EUR 28.84/GC on GCBCM EUR 28.81/GC on DN-GCBCM EUR 28.86/GC on CFGCM EUR 28.86/GC on CSGCM			
	Penalty EUR 70.0/GC not purchased			EUR 1 330

C Programme financed from the Environmental Fund				EUR 13.1 million
C.1 Programme for increasing production of electricity from RES				EUR 1.2 million
C.2 Programme for the installation of heating systems using renewable energy, including the replacement or completion of classical heating systems				EUR 8.2 million
C.3 Programme for the promotion of clean and energy-efficient road transport vehicles.				EUR 3.7 million
D. MADR 2014-2020 M1, M2, M6	Grants for the use of RES, waste, residues and other raw materials for the purposes of the bioeconomy			EUR 0.830 million
Total annual estimated support in the electricity sector				EUR 807.14 million
Total annual estimated support in the heating sector				EUR 9.03 million
Total annual estimated support in the transportation sector				EUR 3.7 million

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].

Article 3(6) of Directive 2003/54/EC has been transposed into the Romanian law by the Electricity Labelling Regulation, as approved by Order No 69/2009 - Revision 1 of ANRE, as published in Part I of Official Gazette No 537/2009.

A detailed review of the Regulation was sent with the first progress report for 2009-2010. The planned objectives include:

- transparency on the electricity market;
- informing and educating the electricity consumers in Romania;
- an energy policy tool for sustainable development.

In accordance with the Energy Labelling Regulation, as approved by Order No 61/2016 of ANRE, the electricity labelling scheme aims at:

- informing the final customers of the structure, origin and environmental impact of the electricity supplied to them, in a comprehensible and easily comparable manner at national level;
- promoting competition on the electricity market by providing an additional criterion for selection of the supplier;
- promoting RES and clean technologies in order to reduce the environmental impact of the electricity sector;

- ensuring harmonisation with the provisions of the relevant Union law.

The Regulation provides for the following:

- minimum requirements for electricity producers and suppliers regarding the determination and transmission of data on the composition of the total quantity of electricity traded in terms of primary energy sources, and of information relating to CO_2 emissions and related radioactive waste;
- minimum requirements for electricity traders (suppliers) regarding the determination and transmission of data on the composition of the total quantity of electricity traded in terms of primary energy sources.

Electricity suppliers prepare the electricity labels corresponding to their own electricity purchasing structures and forward them to the final customers by 31 July at the latest. They prepare the electricity label provided to the customers who are beneficiaries of the universal service, to the final customers who have not exercised their right to eligibility and to those supplied as a last resort according to their own electricity purchasing structure.

For the electricity supplied to consumers using regulated tariffs, the competent authority prepares and publishes the electricity label. There is single data on the electricity production attributes for consumers using regulated tariffs at national level, not being dependent on the primary source portfolio of the energy supplier.

The energy label contains the following mandatory information, which was established by the supplier on the basis of the declarations submitted by the producers:

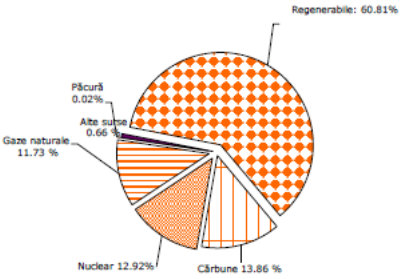
- the share of each primary source of energy in the coverage of the electricity purchase by the supplier;
- the level of specific CO_2 emissions and the radioactive waste pertaining to the electricity they provide;
- a comparison of the above data with the national average values.

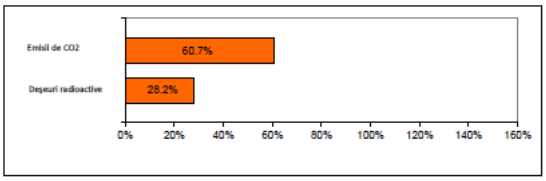
Figures 3.10, 3.11, 3.12 shows the label for the electricity supplied by ENEL Energie Muntenia Sud SA to households final customers as beneficiaries of the universal service in 2018, to the eligible customers who purchased the GREEN ENERGY product in 2017, and to final customers supplied on a competitive basis in 2017.

Etichetă energie electrică furnizată clienţilor finali casnici beneficiari ai serviciului universal în anul 2018

Furnizorul: **Enel Energie Muntenia S.A.**
Telefon: 0800 07 08 09
Fax: 0372.875.266
Email: contacteem.ro@enel.com
Pagină web www.enel.ro
Perioadă de referinţă: 2018

	Sursa primară de energie	Energia electrică a furnizorului Enel Energie Muntenia S.A [%]	Producţie energie electrică România în anul 2018 [%]
	Total din care:		
A.	**Surse convenţionale:**	**39.18%**	**58.72%**
a1	Cărbune	13.86%	24.24%
a2	Nucleară	12.92%	17.65%
a3	Gaze naturale	11.73%	15.02%
a4	Păcură	0.02%	0.03%
a5	Alte surse convenţionale	0.66%	1.78%
B.	**Surse Regenerabile:**	**60.81%**	**41.28%**
b1	Hidroelectrică	49.49%	27.87%
b2	Eoliană	9.02%	9.78%
b3	Biomasă	1.05%	0.47%
b4	Solară	1.24%	3.15%
b5	Alte regenerabile	0.00%	0.01%





0% din energia comercializată de Enel Energie Muntenia provine din import şi este cuprinsă în detalierea de mai sus

Impactul asupra mediului

Furnizorul Enel Energie Muntenia S.A
Emisii specifice de CO2: 175.901 g/KWh
Deşeuri radioactive:0.000846 g/kWh

La nivelul României
Emisii specifice de CO2: 289.85 g/kWh

Deşeuri radioactive:0.003g/kWh

Impactul energiei electrice a furnizorului Enel Energie Muntenia SA asupra mediului înconjurător se situează sub media sectorială

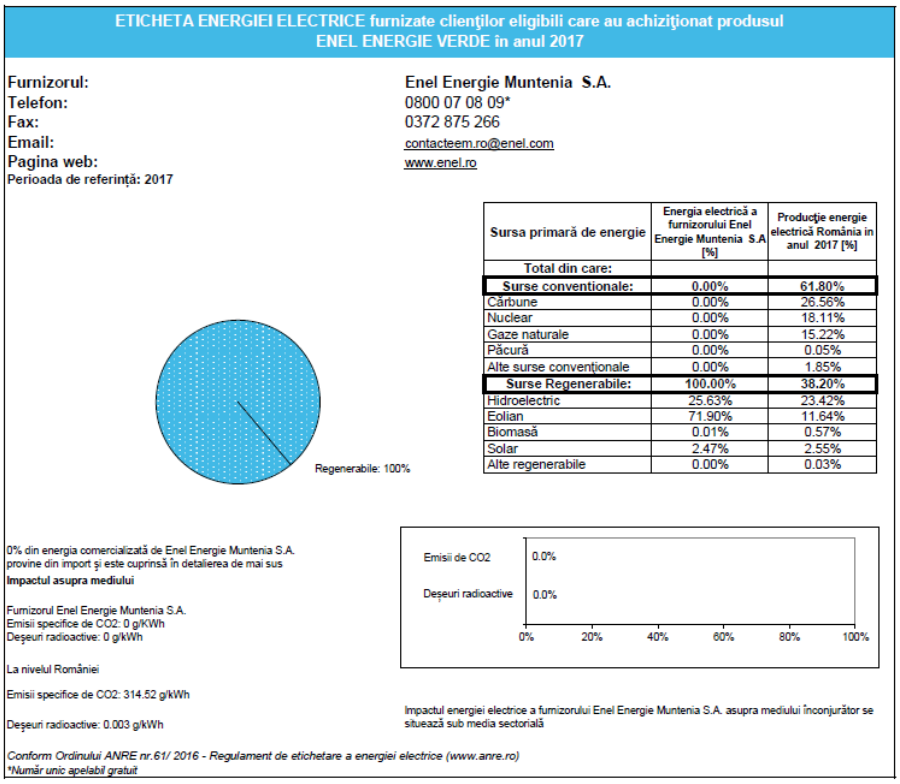
Conform Ordinului ANRE nr.61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)
**Număr unic apelabil gratuit*

Emisii de CO2 (218.53 g/KWh)	176	289.85	60.69%
Deşeuri radioactive (x unităţi/KWh)	0.001	0.003	28%

RO	***EN***
Etichetă energie electrică furnizată clienților finali casnici beneficiari ai serviciului universal în anul 2018	Energy label provided to final household customers as beneficiaries of the universal service in 2018
Furnizorul:	Supplier:
Telefon:	Tel.
Fax:	Fax
Email:	E-mail:
Pagină web	Website
Perioadă de referinţă: 2018	Reference period: 2018
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Enel Energie Muntenia SA [%]	Electricity of the supplier Enel Energie Muntenia SA [%]
Producţie energie electrică România in anul 2018[%]	Production of electricity in Romania in 2018 [%]
Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nucleară	Nuclear
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Surse Regenerabile:	Renewable sources:

Hidroelectrică	Hydropower
Eoliană	Wind
Biomasă	Biomass
Solară	Solar
Alte regenerabile	Other renewable sources
Regenerabilă	Renewable
0% din energia comercializaţi de Enel Energie Muntenia provine din import şi este cuprinşi în detalierea de mai sus	0 % of the energy sold by Enel Energie Muntenia is imported and is included in the detailed statement above
Impactul asupra mediului	Impact on the environment
Furnizorul Enel Energie Muntenia S.A	The supplier Enel Energie Muntenia S.A
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Enel Energie Muntenia SA asupra mediului înconjurător se situează sub media sectorială	The impact of the electricity of the supplier Enel Energie Muntenia SA on the environment is below the sectoral average
Conform Ordinului ANRE nr 61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - The Electricity Labelling Regulation (www.anre.ro)
Număr unic apelabil gratuit	Single free of charge number

Figure 3.10: **Label for the electricity supplied by ENEL Energie Muntenia Sud SA to household customers as beneficiaries of the universal service in 2018**



ETICHETA ENERGIEI ELECTRICE furnizate clienţilor eligibili care au achiziţionat produsul ENEL ENERGIE VERDE în anul 2017

Furnizorul: Enel Energie Muntenia S.A.
Telefon: 0800 07 08 09*
Fax: 0372 875 266
Email: contacteem.ro@enel.com
Pagina web: www.enel.ro
Perioada de referinţă: 2017

Sursa primară de energie	Energia electrică a furnizorului Enel Energie Muntenia S.A [%]	Producţie energie electrică România in anul 2017 [%]
Total din care:		
Surse convenţionale:	0.00%	61.80%
Cărbune	0.00%	26.56%
Nuclear	0.00%	18.11%
Gaze naturale	0.00%	15.22%
Păcură	0.00%	0.05%
Alte surse convenţionale	0.00%	1.85%
Surse Regenerabile:	100.00%	38.20%
Hidroelectric	25.63%	23.42%
Eolian	71.90%	11.64%
Biomasă	0.01%	0.57%
Solar	2.47%	2.55%
Alte regenerabile	0.00%	0.03%

0% din energia comercializată de Enel Energie Muntenia S.A. provine din import şi este cuprinsă în detalierea de mai sus

Impactul asupra mediului

Furnizorul Enel Energie Muntenia S.A.
Emisii specifice de CO2: 0 g/KWh
Deşeuri radioactive: 0 g/kWh

La nivelul României

Emisii specifice de CO2: 314.52 g/kWh

Deşeuri radioactive: 0.003 g/kWh

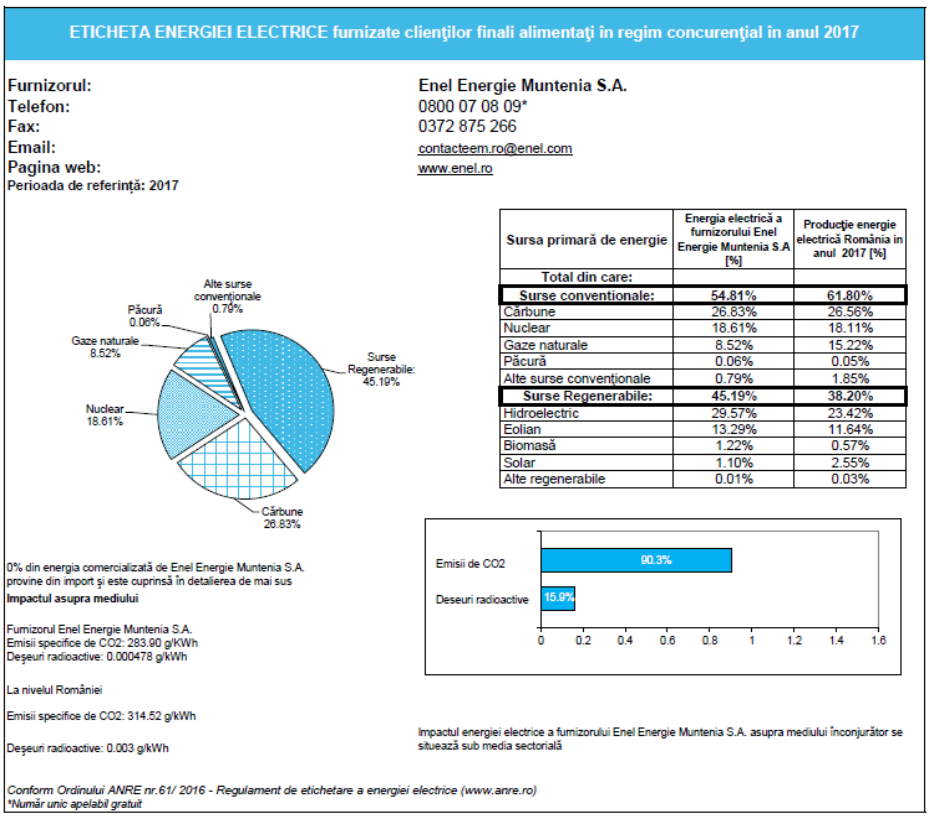
Impactul energiei electrice a furnizorului Enel Energie Muntenia S.A. asupra mediului înconjurător se situează sub media sectorială

Conform Ordinului ANRE nr.61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)
**Număr unic apelabil gratuit*

RO	***EN***

ETICHETA ENERGIEI ELECTRICE furnizate clienţilor eligibili care au achiziţionat produsul ENEL ENERGIE VERDE in anul 2017	THE ENERGY LABEL provided to eligible customers who purchased the product ENEL ENERGIE VERDE in 2017
Furnizorul:	Supplier:
Telefon:	Tel.
Fax:	Fax
Email:	E-mail:
Pagină web	Website
Perioadă de referinţă: 2017	Reference period: 2017
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Enel Energie Muntenia SA [%]	Electricity of the supplier Enel Energie Muntenia SA [%]
Producţie energie electrică România în anul 2017[%]	Production of electricity in Romania in 2017 [%]
Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nucleară	Nuclear
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Surse Regenerabile:	Renewable sources:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Regenerabilă	Renewable
0% din energia comercializaţi de Enel Energie Muntenia provine din import şi este cuprinşi în detalierea de mai sus	0 % of the energy sold by Enel Energie Muntenia is imported and is included in the detailed statement above
Impactul asupra mediului	Impact on the environment
Furnizorul Enel Energie Muntenia S.A	The supplier Enel Energie Muntenia S.A
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Enel Energie Muntenia SA asupra mediului înconjurător se situează sub media sectorială	The electricity impact of the supplier Enel Energie Muntenia SA on the environment is below the sectoral average
Conform Ordinului ANRE nr 61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - The Electricity Labelling Regulation (www.anre.ro)
Numit unic apelabil gratuit	Single free of charge number

Figure 3.11: **Label for the electricity supplied by ENEL Energie Muntenia Sud SA to eligible customers who purchased the GREEN ENERGY product in 2017**



ETICHETA ENERGIEI ELECTRICE furnizate clienţilor finali alimentaţi în regim concurenţial în anul 2017

Furnizorul: **Enel Energie Muntenia S.A.**
Telefon: 0800 07 08 09*
Fax: 0372 875 266
Email: contacteem.ro@enel.com
Pagina web: www.enel.ro
Perioada de referinţă: 2017

Sursa primară de energie	Energia electrică a furnizorului Enel Energie Muntenia S.A [%]	Producţie energie electrică România in anul 2017 [%]
Total din care:		
Surse convenţionale:	54.81%	61.80%
Cărbune	26.83%	26.56%
Nuclear	18.61%	18.11%
Gaze naturale	8.52%	15.22%
Păcură	0.06%	0.05%
Alte surse convenţionale	0.79%	1.85%
Surse Regenerabile:	45.19%	38.20%
Hidroelectric	29.57%	23.42%
Eolian	13.29%	11.64%
Biomasă	1.22%	0.57%
Solar	1.10%	2.55%
Alte regenerabile	0.01%	0.03%

0% din energia comercializată de Enel Energie Muntenia S.A. provine din import şi este cuprinsă în detalierea de mai sus

Impactul asupra mediului

Furnizorul Enel Energie Muntenia S.A.
Emisii specifice de CO2: 283.90 g/kWh
Deşeuri radioactive: 0.000478 g/kWh

La nivelul României

Emisii specifice de CO2: 314.52 g/kWh

Deşeuri radioactive: 0.003 g/kWh

Impactul energiei electrice a furnizorului Enel Energie Muntenia S.A. asupra mediului înconjurător se situează sub media sectorială

Conform Ordinului ANRE nr.61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)
**Număr unic apelabil gratuit*

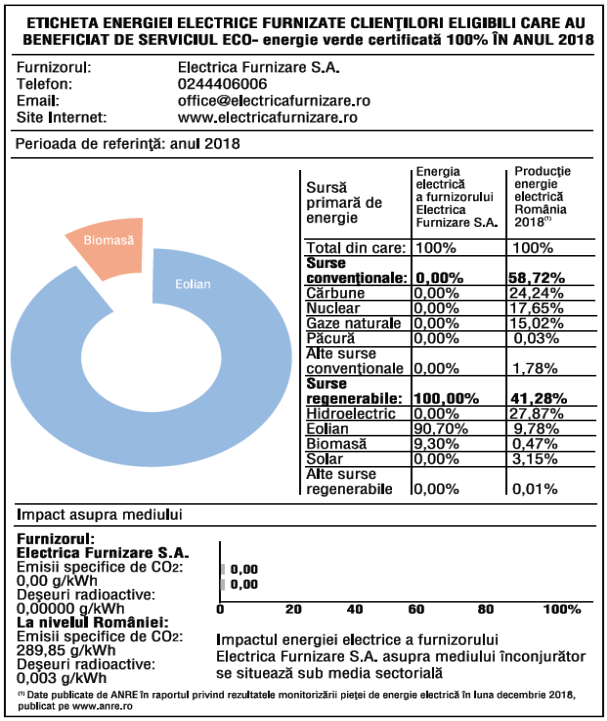
RO	***EN***
ETICHETA ENERGIEI ELECTRICE furnizate clienţilor finali alimentaţi în regim concurenţial în anul 2017	THE ENERGY LABEL provided to final customers supplied on a competitive basis in 2017
Furnizorul:	Supplier:
Telefon:	Tel.
Fax:	Fax
Email:	E-mail:
Pagină web	Website
Perioadă de referinţă: 2017	Reference period: 2017
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Enel Energie Muntenia SA [%]	Electricity of the supplier Enel Energie Muntenia SA [%]
Producţie energie electrică România în anul 2017[%]	Production of electricity in Romania in 2017 [%]
Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources

Surse Regenerabile:	Renewable sources:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Regenerabilă	Renewable
0% din energia comercializaţi de Enel Energie Muntenia provine din import şi este cuprinşi în detalierea de mai sus	0 % of the energy sold by Enel Energie Muntenia is imported and is included in the detailed statement above
Impactul asupra mediului	Impact on the environment
Furnizorul Enel Energie Muntenia S.A	The supplier Enel Energie Muntenia S.A
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Enel Energie Muntenia SA asupra mediului înconjurător se situează sub media sectorială	The electricity impact of the supplier Enel Energie Muntenia SA on the environment is below the sectoral average
Conform Ordinului ANRE nr 61/ 2016 - Regulament de etichetare a energiei electrice (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - The Electricity Labelling Regulation (www.anre.ro)
Numit unic apelabil gratuit	Single free of charge number

Figure 3.12: **Label for the electricity supplied by ENEL Energie Muntenia Sud SA to final customers supplied on a competitive basis in 2017**

Figures 3.13, 3.14, and 3.15 show the label of the electricity supplied in 2018 by Electrica Furnizare SA to the eligible customers which benefitted from the 100 % certified green energy ECO service, to the final customers as beneficiaries of the universal service and to the final customers supplied on a competitive basis.

Figures 3.16, 3.17, and 3.18 show the label of the electricity supplied in 2018 by SC E.ON ENERGIE ROMANIA SA to customers supplied as a last resort, to the eligible customers and to the final customers as beneficiaries of the universal service.



ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILORI ELIGIBILI CARE AU BENEFICIAT DE SERVICIUL ECO- energie verde certificată 100% ÎN ANUL 2018

Furnizorul: Electrica Furnizare S.A.
Telefon: 0244406006
Email: office@electricafurnizare.ro
Site Internet: www.electricafurnizare.ro

Perioada de referinţă: anul 2018

Sursă primară de energie	Energia electrică a furnizorului Electrica Furnizare S.A.	Producţie energie electrică România 2018(*)
Total din care:	100%	100%
Surse convenţionale:	**0,00%**	**58,72%**
Cărbune	0,00%	24,24%
Nuclear	0,00%	17,65%
Gaze naturale	0,00%	15,02%
Păcură	0,00%	0,03%
Alte surse convenţionale	0,00%	1,78%
Surse regenerabile:	**100,00%**	**41,28%**
Hidroelectric	0,00%	27,87%
Eolian	90,70%	9,78%
Biomasă	9,30%	0,47%
Solar	0,00%	3,15%
Alte surse regenerabile	0,00%	0,01%

Impact asupra mediului

Furnizorul:
Electrica Furnizare S.A.
Emisii specifice de CO_2:
0,00 g/kWh
Deşeuri radioactive:
0,00000 g/kWh
La nivelul României:
Emisii specifice de CO_2:
289,85 g/kWh
Deşeuri radioactive:
0,003 g/kWh

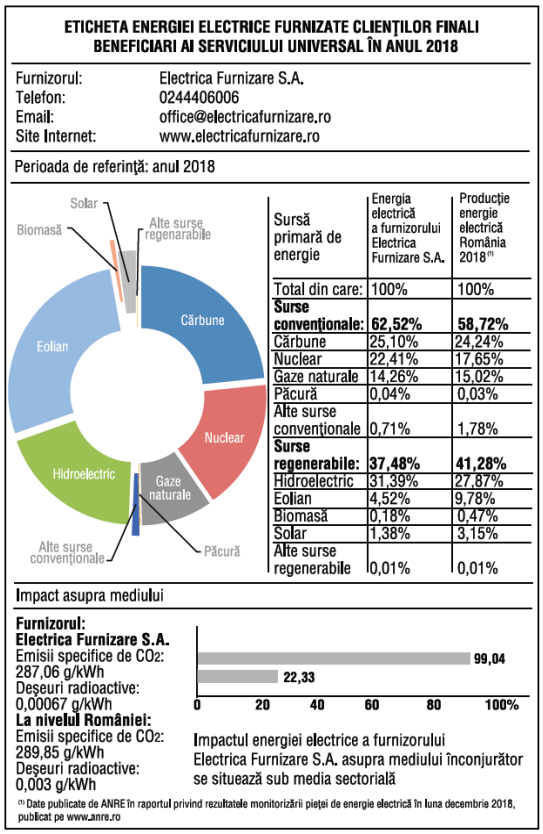
Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială

(*) Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro

RO	***EN***
ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILORI ELIGIBILI CARE AU BENEFICIAT DE SERVICIUL ECO- energie verde certificată 100% ÎN ANUL 2018	THE ENERGY LABEL PROVIDED TO ELIGIBLE CUSTOMERS WHO BENEFITED FROM THE SERVICE ECO - 100 % certified green energy in 2018
Furnizorul:	Supplier:
Telefon:	Tel.
Fax:	Fax
Email:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Biomasă	Biomass
Eolian	Wind
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Electrica Furnizare S.A.	The electricity of the supplier Electrica Furnizare SA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018
Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Surse Regenerabile:	Renewable sources:
Hidroelectric	Hydropower
Eolian	Wind

Biomasă	Biomass
Solar	Solar energy
Alte surse regenerabile	Other renewable sources
Impactul asupra mediului	Impact on the environment
Furnizorul:	Supplier:
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială	The electricity impact of the supplier Electrica Furnizare SA on the environment is below the sectoral average
Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro	The data published by ANRE in the report on the results of the monitoring of the electricity market in December 2018, as published on www.anre.ro

Figure 3.13: **The label for the electricity supplied by Electrica Furnizare SA in 2018 to final customers benefitting from a certified green energy ECO service - 100 % certified green energy**



ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILOR FINALI BENEFICIARI AI SERVICIULUI UNIVERSAL ÎN ANUL 2018

Furnizorul: Electrica Furnizare S.A.
Telefon: 0244406006
Email: office@electricafurnizare.ro
Site Internet: www.electricafurnizare.ro

Perioada de referinţă: anul 2018

Sursă primară de energie	Energia electrică a furnizorului Electrica Furnizare S.A.	Producţie energie electrică România 2018 (1)
Total din care:	100%	100%
Surse convenţionale:	**62,52%**	**58,72%**
Cărbune	25,10%	24,24%
Nuclear	22,41%	17,65%
Gaze naturale	14,26%	15,02%
Păcură	0,04%	0,03%
Alte surse convenţionale	0,71%	1,78%
Surse regenerabile:	**37,48%**	**41,28%**
Hidroelectric	31,39%	27,87%
Eolian	4,52%	9,78%
Biomasă	0,18%	0,47%
Solar	1,38%	3,15%
Alte surse regenerabile	0,01%	0,01%

Impact asupra mediului

Furnizorul: Electrica Furnizare S.A.
Emisii specifice de CO_2: 287,06 g/kWh
Deşeuri radioactive: 0,00067 g/kWh
La nivelul României:
Emisii specifice de CO_2: 289,85 g/kWh
Deşeuri radioactive: 0,003 g/kWh

Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială

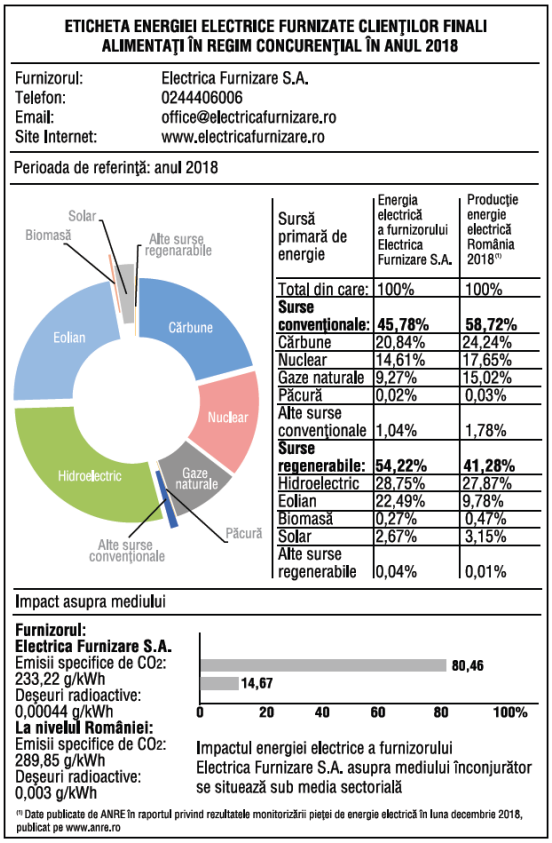
(1) Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro

RO	***EN***
ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILOR FINALI BENEFICIARI AI SERVICIULUI UNIVERSAL ÎN ANUL 2018	THE ENERGY LABEL PROVIDED TO FINAL CUSTOMERS AS BENEFICIARIES OF THE UNIVERSAL SERVICE IN 2018
Furnizorul:	Supplier:

Telefon:	Tel.
Email:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Solar	Solar energy
Alte surse regenerabile	Other renewable sources
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse, convenţionale	Other conventional sources
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Electrica Furnizare S.A.	The electricity of the supplier Electrica Furnizare SA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018
Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Surse regenerabile:	Renewable sources:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte surse regenerabile	Other renewable sources
Impactul asupra mediului	Impact on the environment
Furnizorul:	Supplier:
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială	The electricity impact of the supplier Electrica Furnizare SA on the environment is below the sectoral average
Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro	The data published by ANRE in the report on the results of the monitoring of the electricity market in December 2018, as published on www.anre.ro

Figure 3.14: **Label for the electricity supplied by Electrica Furnizare SA**

in 2018 to final customers as beneficiaries of the universal service



ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILOR FINALI ALIMENTAŢI ÎN REGIM CONCURENŢIAL ÎN ANUL 2018

Furnizorul: Electrica Furnizare S.A.
Telefon: 0244406006
Email: office@electricafurnizare.ro
Site Internet: www.electricafurnizare.ro

Perioada de referinţă: anul 2018

Sursă primară de energie	Energia electrică a furnizorului Electrica Furnizare S.A.	Producţie energie electrică România 2018[1]
Total din care:	100%	100%
Surse convenţionale:	**45,78%**	**58,72%**
Cărbune	20,84%	24,24%
Nuclear	14,61%	17,65%
Gaze naturale	9,27%	15,02%
Păcură	0,02%	0,03%
Alte surse convenţionale	1,04%	1,78%
Surse regenerabile:	**54,22%**	**41,28%**
Hidroelectric	28,75%	27,87%
Eolian	22,49%	9,78%
Biomasă	0,27%	0,47%
Solar	2,67%	3,15%
Alte surse regenerabile	0,04%	0,01%

Impact asupra mediului

Furnizorul: Electrica Furnizare S.A.
Emisii specifice de CO_2: 233,22 g/kWh
Deşeuri radioactive: 0,00044 g/kWh
La nivelul României:
Emisii specifice de CO_2: 289,85 g/kWh
Deşeuri radioactive: 0,003 g/kWh

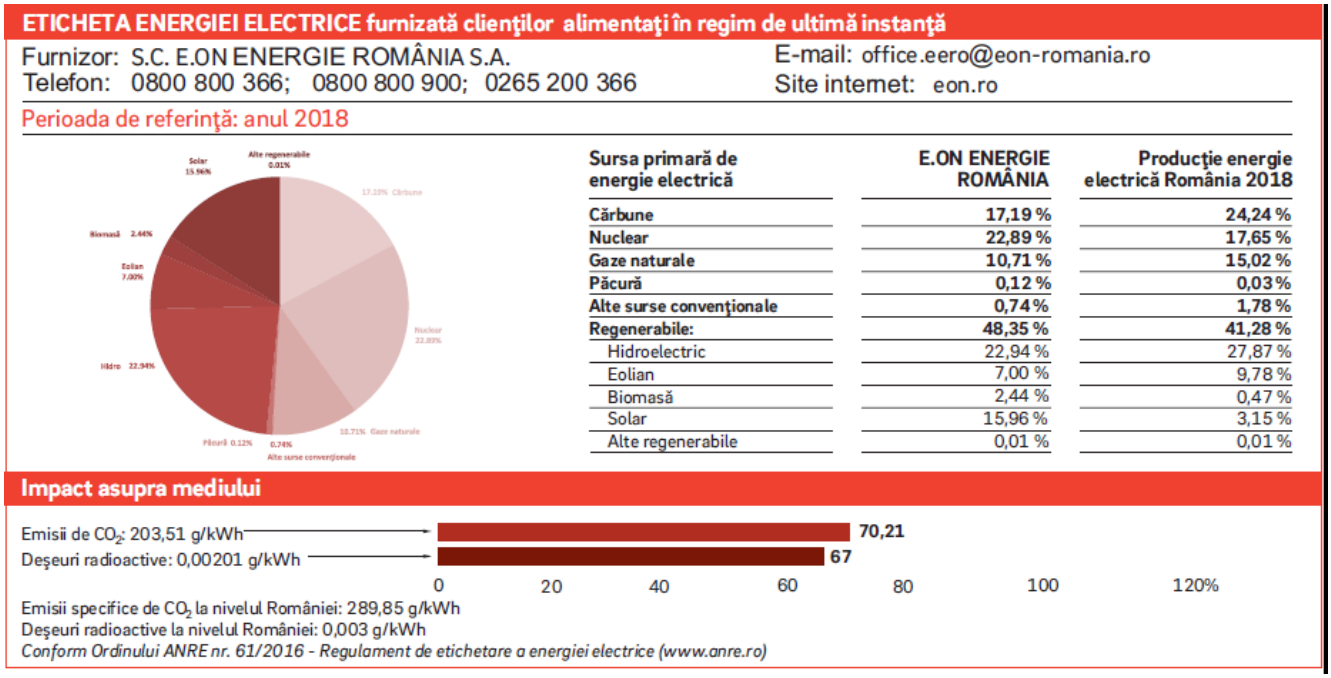
Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială

[1] Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro

RO	***EN***
ETICHETA ENERGIEI ELECTRICE FURNIZATE CLIENŢILOR FINALI ALIMENTAŢI IN REGIM CONCURENŢIAL ÎN ANUL 2018	THE ENERGY LABEL PROVIDED TO FINAL CUSTOMERS SUPPLIED ON A COMPETITIVE BASIS IN 2018
Furnizorul:	Supplier:
Telefon:	Tel.
Email:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Solar	Solar energy
Alte surse regenerabile	Other renewable sources
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse, convenţionale	Other conventional sources
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Sursa primară de energie	Primary source of energy
Energia electrică a furnizorului Electrica Furnizare S.A.	The electricity of the supplier Electrica Furnizare SA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018

Total din care:	Total, of which:
Surse convenţionale:	Conventional sources:
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Surse regenerabile:	Renewable sources:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte surse regenerabile	Other renewable sources
Impactul asupra mediului	Impact on the environment
Furnizorul:	Supplier:
Emisii specifice de CO2:	Specific CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
La nivelul României	In Romania
Impactul energiei electrice a furnizorului Electrica Furnizare S.A. asupra mediului înconjurător se situează sub media sectorială	The electricity impact of the supplier Electrica Furnizare SA on the environment is below the sectoral average
Date publicate de ANRE în raportul privind rezultatele monitorizării pieţei de energie electrică în luna decembrie 2018, publicat pe www.anre.ro	The data published by ANRE in the report on the results of the monitoring of the electricity market in December 2018, as published on www.anre.ro

Figure 3.15: **Label for the electricity supplied by Electrica Furnizare SA in 2018 to final customers supplied on a competitive basis**



RO	***EN***

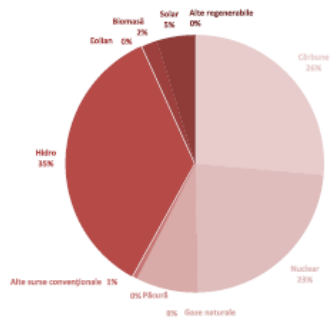
ETICHETA ENERGIEI ELECTRICE furnizată clienţilor alimentați in regim de ultimă instanță	THE ENERGY LABEL provided to the customers supplied as a last resort
Furnizor:	Supplier:
Telefon:	Tel.
E-mail:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Solar	Solar energy
Alte regenerabile	Other renewable sources
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Hidro	Hydro
Eolian	Wind
Biomasă	Biomass
Sursa primară de energie electrică	Primary source of energy
E.ON ENERGIE ROMÂNIA	E.ON ENERGIE ROMÂNIA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Regenerabile:	Renewable:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Impact asupra mediului	Impact on the environment
Emisii de CO2:	CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
Emisii specifice de CO2 la nivelul României:	Specific CO2 emissions in Romania:
Deşeuri radioactive la nivelul României	Radioactive waste in Romania
Conform Ordinului ANRE nr. 61/2016 - *Regulament de etichetare o energiei electrice* (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - *the Energy Labelling Regulation* (www.anre.ro)

Figure 3.16: **Label for the electricity supplied by SC E.ON ENERGIE ROMANIA SA in 2018 to final customers supplied as a last resort**

ETICHETA ENERGIEI ELECTRICE furnizată către clienţii eligibili

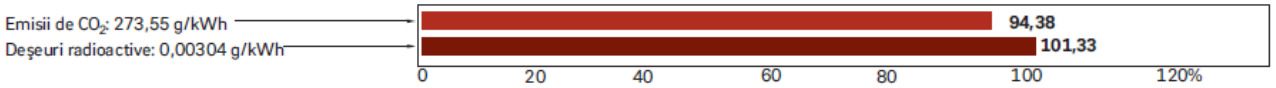
Furnizor: S.C. E.ON ENERGIE ROMÂNIA S.A.
Telefon: 0800 800 366; 0800 800 900; 0265 200 366
E-mail: office.eero@eon-romania.ro
Site internet: eon.ro

Perioada de referinţă: anul 2018



Sursa primară de energie electrică	E.ON ENERGIE ROMÂNIA	Producţie energie electrică România 2018
Cărbune	**26,43 %**	**24,74 %**
Nuclear	**23,24 %**	**17,65 %**
Gaze naturale	**7,83 %**	**15,02 %**
Păcură	**0,05 %**	**0,03 %**
Alte surse convenţionale	**0,49 %**	**1,78 %**
Regenerabile:	**41,96 %**	**41,28 %**
Hidroelectric	35,18 %	27,87 %
Eolian	0,00 %	9,78 %
Biomasă	1,95 %	0,47 %
Solar	4,82 %	3,15 %
Alte regenerabile	0,01 %	0,01 %

Impact asupra mediului

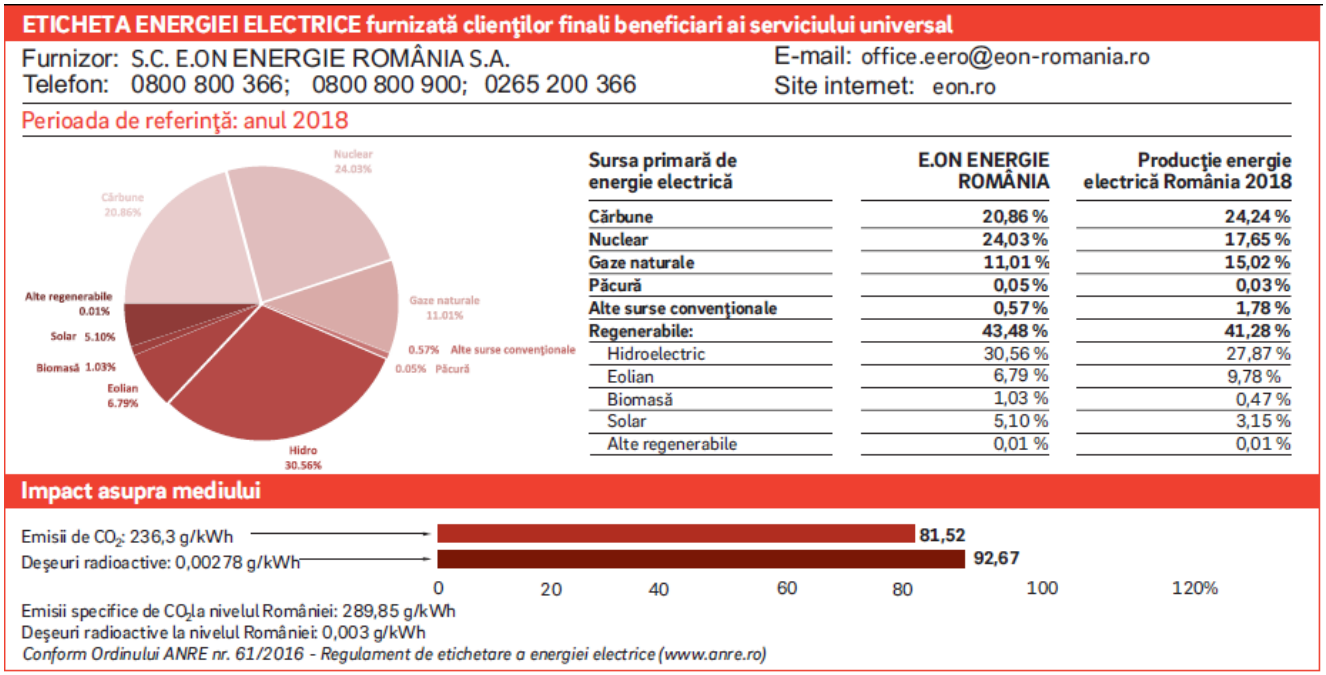


Emisii specifice de CO_2 la nivelul României: 289,85 g/kWh
Deşeuri radioactive la nivelul României: 0,003 g/kWh
Conform Ordinului ANRE nr. 61/2016 - Regulament de etichetare a energiei electrice (www.anre.ro)

RO	***EN***
ETICHETA ENERGIEI ELECTRICE furnizată către clienții eligibili	THE ENERGY LABEL provided to eligible customers
Furnizor:	Supplier:
Telefon:	Tel.
E-mail:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Solar	Solar energy
Alte regenerabile	Other renewable sources
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Hidro	Hydro
Eolian	Wind
Biomasă	Biomass
Sursa primară de energie electrică	Primary source of energy
E.ON ENERGIE ROMÂNIA	E.ON ENERGIE ROMÂNIA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Regenerabile:	Renewable:
Hidroelectric	Hydropower

Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Impact asupra mediului	Impact on the environment
Emisii de CO2:	CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
Emisii specifice de CO2 la nivelul României:	Specific CO2 emissions in Romania:
Deşeuri radioactive la nivelul României	Radioactive waste in Romania
Conform Ordinului ANRE nr. 61/2016 - *Regulament de etichetare o energiei electrice* (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - *the Energy Labelling Regulation* (www.anre.ro)

Figure 3.17: **Label for the electricity supplied by SC E.ON ENERGIE ROMANIA SA in 2018 to eligible customers**



RO	***EN***
ETICHETA ENERGIEI ELECTRICE furnizată clienților finali beneficiari ai serviciului universal	ENERGY LABEL provided to final customers as beneficiaries of the universal service
Furnizor:	Supplier:
Telefon:	Tel.
E-mail:	E-mail:
Site internet	Website
Perioadă de referinţă: anul 2018	Reference period: 2018
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Alte surse convenţionale	Other conventional sources
Păcură	Fuel oil
Hidro	Hydro

Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Cărbune	Coal
Sursa primară de energie electrică	Primary source of energy
E.ON ENERGIE ROMÂNIA	E.ON ENERGIE ROMÂNIA
Producţie energie electrică România 2018	Production of electricity in Romania in 2018
Cărbune	Coal
Nuclear	Nuclear energy
Gaze naturale	Natural gas
Păcură	Fuel oil
Alte surse convenţionale	Other conventional sources
Regenerabile:	Renewable:
Hidroelectric	Hydropower
Eolian	Wind
Biomasă	Biomass
Solar	Solar energy
Alte regenerabile	Other renewable sources
Impact asupra mediului	Impact on the environment
Emisii de CO2:	CO2 emissions:
Deşeuri radioactive:	Radioactive waste:
Emisii specifice de CO2 la nivelul României:	Specific CO2 emissions in Romania:
Deşeuri radioactive la nivelul României	Radioactive waste in Romania
Conform Ordinului ANRE nr. 61/2016 - *Regulament de etichetare o energiei electrice* (www.anre.ro)	In accordance with Order No 61/2016 of ANRE - *the Energy Labelling Regulation* (www.anre.ro)

Figure 3.18: **Label for the electricity supplied by SC E.ON ENERGIE ROMANIA SA in 2018 to final customers as beneficiaries of the universal service**

4. **Information on how, where applicable, the 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].**

The effort of harnessing the renewable energy resources in Romania has also taken into account the possibilities of directing the support schemes towards the applications that give additional benefits, but entail higher costs, being generally deemed unattractive by investors. The assessment and reassessment of the opportunities provided by the harnessing of renewable energies in specific applications are ongoing and these applications are embedded in the support schemes on the primary and secondary law levels and by specific methodologies promoting certain measures.

The co-financing by the European Commission and by the national State budget of projects in the energy sector under the Sectoral Operational Programmes was structured so as to promote applications that provide additional benefits, but which entail higher costs. Projects with a high net economic value that have a poor financial profitability and are deterred from projects offering a financial return higher than the average by industry or by technology are thus awarded more points under the project assessment criteria for non-reimbursable co-financing. In this way, applications for harnessing local geothermal resources or municipal public lighting from renewable energy sources have become eligible. Another category of eligible projects scored favourably during the evaluation is that of projects that harness biomass in high-efficiency cogeneration plants. Romania has recorded a low increase in biomass plants in relation to the NREAP estimates and to the potential national resources available.

The Large Infrastructure Operational Programme was structured such as to ensure the co-financing of the projects of Transmission and System Operators and of Distribution Operators regarding the strengthening of the networks taking over and transmitting the electricity produced in power plants from renewable sources. The PA6 Priority Axis of the LIOP has the specific objective of developing and/or upgrading the facilities producing electricity and/or thermal energy from biomass and biogas, and of developing and upgrading the facilities producing thermal energy based on geothermal energy.

The programmes financed from the Environmental Fund were structured to take into account applications that provide additional benefits, such as:

- financing natural persons for applications (electricity and/or heat from RES) in individual households, applications for local consumption, which do not affect electricity grids;
- financing public institutions and administrative territorial units supplementing or replacing the conventional heating/lighting systems using RES-E systems in their own buildings;
- subsidising the purchase of electric or hybrid vehicles.

With reference to the promotion of biofuels produced from waste, residues, non-food cellulosic material, and ligno-cellulosic material, Government Decision No 935/2011 was amended by Government Decision No 918/2012 in the sense that the mandatory biofuel values for the petrol and gas oil sold through pumps can be reduced by half if the biofuels obtained from the abovementioned

waste are used. Consequently, the first applications for the production of food-based biofuels have emerged in Romania.

However, there were further budgetary difficulties in the reporting period 2017-2018, which did not allow for the development of support schemes for investments in high cost technologies in the field of biofuels, all the more so as there is no infrastructure in place, as required for the extensive use of waste, including the production of biofuels from waste, residues, non-food cellulosic material, and ligno-cellulosic material.

5. **Information on 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]**

Certification of the origin of the electricity produced from renewable energy sources (RES-E) is covered by Article 15 of Directive 2009/28/EC.

The Regulation on the issue and tracing of guarantees of origin for the electricity produced from renewable energy sources was approved by Government Decision No 1232/2011, Article 15 of Directive 2009/28/EC being transposed into the national law.

The system of certification of the origin of the electricity produced from renewable sources (RES-E) proposed to enhance transparency towards the client by differentiating between the electricity produced from renewable energy sources and the electricity produced from conventional sources, which was reflected in the allocation of certificates of origin to RES-E producers. The Regulation laid down criteria for the issue and tracing of guarantees of origin that certify the origin of RES-E:

- how to apply and the conditions for the issue of guarantees of origin;
- the conditions regarding the transfer, use, withdrawal or cancellation of guarantees of origin;
- how to register guarantees of origin and how to manage the information on them;
- the conditions for recognising the guarantees of origin issued by other EU Member States.

In accordance with Government Decision No 1232/2011, ANRE prepares annually the "Report on the monitoring of guarantees of origin for the electricity produced from renewable energy sources".

The Regulation for accreditation of RES-E producers for applying the green certificates promotion system, as approved by Order No 42/2011 of ANRE, defined the conditions for accreditation of power plants producing electricity from renewable energy sources for production technologies from wind, hydro, solar, biomass and biogas sources.

On 26 June 2014, ANRE approved, by its Order No 48/2014, the new Regulation for accreditation of producers of electricity from renewable energy sources for applying the green certificates promotion system and repealed Order No 42/2011. In accordance with this Regulation, in order to be accredited, RES power plants have to measure the RES energy and to demonstrate that they ensure separate measurement by power unit and type of RES, and for multi-fuel and cogeneration plants, they must measure the quantity and quality of the fuels used. In addition to the documents and declarations that must be submitted in order to meet the accreditation requirements, ANRE monitors and has the right to control the accredited facilities, having the capacity to amend, to suspend or to withdraw the accreditation.

The quantities of electricity produced from RES and supplied to the grids are also transmitted during the monitoring process conducted by ANRE, such quantities being recorded by TSO on a monthly basis per producer and published in the section of Green Certificates Market (Piata Certificatelor Verzi) on the website www.transelectrica.ro.

The system of accreditation of RES producers and of monitoring production and compliance with the accreditation requirements certifies the origin of RES-E production for a significant quantity of electricity obtained from renewable sources.

In accordance with this Regulation, ANRE is the body that issues the guarantees of origin to RES-E producers on their written request. The purpose of the system of certification of the origin of the electricity produced from renewable sources (RES-E) is to enhance transparency towards the client by differentiating between the electricity produced from renewable energy sources and the electricity produced from conventional sources.

The guarantee of origin is thus a single electronic document which provides the final customer with evidence that a share or quantity of electricity has been produced from renewable energy sources.

2017 is the fourth year of implementation of the certification system for the origin of RES-E after the European and national law has been amended.

At the end of **2017**, 859 RES-E producers licensed for production of electricity were registered, nine of which using two or several types of renewable energy sources (RES), as follows:

- Wind energy - 88 RES-E producers,
- Hydropower - 114 RES-E producers,
- Biomass energy - 35 RES-E producers,
- Photovoltaic energy - 631 RES-E producers.

The presented data was retrieved following the interrogation of the MIS application of ANRE for guarantees of origin.
The RES-E producers who applied for and for whom guarantees of origin were issued in 2017 are listed in **Table 5.1** by type of RES.

Table 5.1: **Centralised statement of guarantees of origin issued by producer and by type of RES in 2017**

No	RES-E producer name	GO number	Type of RES
1	ALIZEU EOLIAN	89 186	Wind energy
2	AMV SOLAR	533	Solar energy
3	BRAILA WIND	76 404	Wind energy
4	BRIGE COSTRUCT	11 515	Wind energy
5	CERNAVODĂ POWER	221 537	Wind energy
6	COMPANIA COLTERM	1 894	Hydropower
7	CORABIA SOLAR	9 684	Solar energy
8	CORNI EOLIAN	210 224	Wind energy
9	CUJMIR SOLAR	14 273	Solar energy
10	D&P ELECTRONIC SERVICE	290	Solar energy
11	DAN HOLDING MGM	18 040	Wind energy
12	ECO POWER WIND	28 051	Wind energy
13	EDPR ROMANIA	383 497	Wind energy
14	ELECTRICOM	12 008	Wind energy

No	RES-E producer name	GO number	Type of RES
15	ELECTROCARBON	54 237	Hydropower
16	ELSID	68 400	Hydropower
17	ENENL GREEN POWER Romania	1 319 440 44 899	Wind energy Solar energy
18	ENERGIE ECOLOGICĂ ROGIS SGR	2 128	Hydropower
19	EOL ENERGY MOLDOVA	39 486	Wind energy
20	EVIVA NALBAT	17 767	Wind energy
21	EWIND	267 484	Wind energy
22	EYE MALL	3 465	Solar energy
23	FOTON DELTA	4 681	Solar energy
24	FOTON EPSILON	8 758	Solar energy
25	GREEN ENERGY FARM	19 186	Wind energy
26	HOLROM RENEWABLE ENERGY	23 716	Wind energy
27	INTERTRANS KARLA	7 471	Wind energy
28	KELAVENT CHARLIE	27 654	Wind energy
29	KELAVENT ECHO	24 226	Wind energy
30	LJG GREEN SOURCE ENERGY BETTA	3 718	Solar energy
31	LJG GREEN SOURCE ENERGY GAMA	10 057	Solar energy
32	MAR-TIN SOLAR ENERGY	1 600	Solar energy
33	MIREASA ENERGIES	134 808	Wind energy
34	MONSSON ALMA	11 919 1107	Wind energy Solar energy
35	NEXT ENERGY PARTENERS	6 695	Wind energy
36	OVIDIU DEVELOPMENT	649 077	Wind energy
37	PESTERA WIND FARM	143 902	Wind energy
38	POTELU SOLAR	8 821	Solar energy
39	POWER L.I.V.E ONE	13 635	Solar energy
40	SIBIOARA WIND FARM	51 390	Wind energy
41	SINGURENI PV PLANT	488	Solar energy
42	SKYBASE ENERGZ	7 269	Solar energy
43	SMART CLEAN POWER	22 927	Wind energy
44	SMART BREEZE	23 348	Wind energy
45	SC HIDROELECTRICA SA	9 238 249	Hydropower
46	SOFT GROUP	31 592	Wind energy
47	SOLPRIM	1 394	Solar energy
48	STUDINA SOLAR	11 633	Solar energy
49	TEB PROJECT ONE	9 277	Biomass
50	TINMAR GREEN ENERGY	1707	Wind energy
51	TOMIS TEAM	347 415	Wind energy
52	VANJU MARE SOLAR	10 427	Solar energy
53	VS WIND FAEM	100 997	Wind energy
54	WIND PARK INVESTMENT	16 582	Wind energy
55	WIND STARS	14 192	Wind energy
56	WIND FARM MV1	27 417	Wind energy
TOTAL		**13 903 382**	

Source: Report on the monitoring of guarantees of origin for the electricity produced from renewable energy sources for 2017; ANRE 2018

Following the applications submitted by 56 RES-E producers, ANRE issued 13 903 382 guarantees of origin corresponding to a quantity of 13 903 382 MWh of RES-E. The data in **Table 5.1** has revealed that 56 RES-E producers applied for guarantees of origin, which equates to 6.52 % of the total 859 RES-E producers.
For SC Hidroelectrica SA, which received 9 238 249 guarantees of origin, they accounted for 72.66 % of the total guarantees of origin issued in 2017.

In **2018**, following the applications submitted by 66 RES-E producers, which equated to 7.65 % of the total 863 RES-E producers, ANRE issued 14 843 568 guarantees of origin corresponding to a quantity of 14 843 568 MWh of RES-E.

For SC Hidroelectrica SA, which received 10 542 879 guarantees of origin, they accounted for 71.03 % of the total guarantees of origin issued in 2018. **Table 5.2** shows the total number of guarantees of origin issued for each type of RES in 2017 and 2018.

Table 5.2: **Total number of guarantees of origin issued by type of RES and RES-E producer in 2017 and 2018**

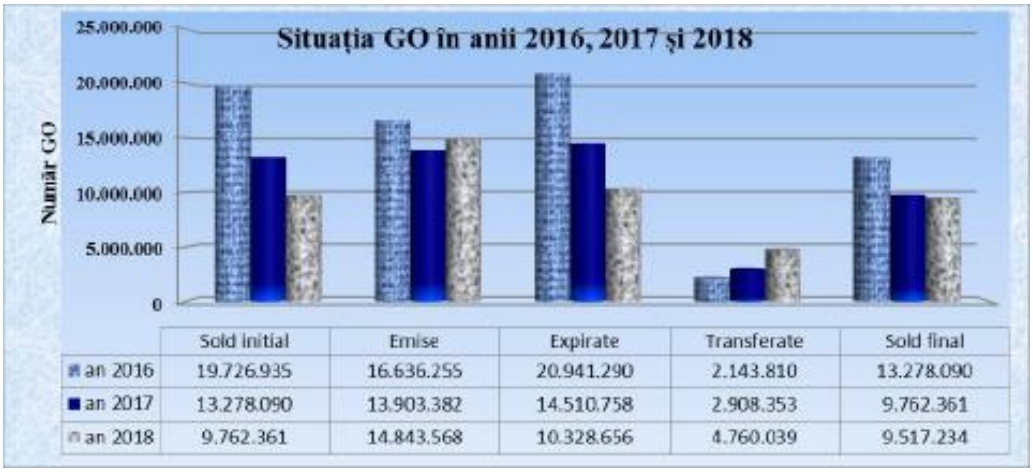
Year	TYPE OF RES	Number of RES-E producers	Number of guarantees of origin (GO) issued
2017	Hydropower	5	9 365 024
	Solar energy	17	156 732
	Wind energy	33	2 372 339
	Biomass	1	9 287
	TOTAL	**56**	**13 903 382**
2018	Hydropower	8	10 705 601
	Solar energy	19	236 018
	Wind energy	38	3 897 431
	Biomass	1	4 518
	TOTAL	**66**	**14 843 568**

Source: Reports on the monitoring of guarantees of origin for the electricity produced from renewable energy sources for 2017 and 2018 ANRE 2017, 2018

The following conclusions have been drawn from the analysis of the centralised statement of holders of guarantees of origin in 2017 and 2018, which outlines the number of expired guarantees of origin in the producer's account and the percentage of guarantees of origin transferred by RES-E producers:

- A number of 2 908 353 and, respectively, 4 760 039 guarantees of origin were transferred from the RES-E producers' account to the electricity suppliers' account in 2017 and 2018, equating to 22.95 % and 33.34 % of the number of guarantees of origin held by RES-E producers in 2017 and 2018.
- A number of 588 446 and, respectively, 613 953 guarantees of origin were used by the electricity suppliers to final customers in 2017 and 2018, equating to 4.64 % and 4.30 % of the number of guarantees of origin held by RES-E producers in 2017 and 2018.
- Compared to 2016 and 2017, there was an improvement in 2018 in the operations concerning the issue and transfer of guarantees of origin, so the number of transferred guarantees of origin

has been on a slightly upward trend and the number of guarantees issued and expired in the producers' portfolio has been on a downward trend (**Figure 5.1**).



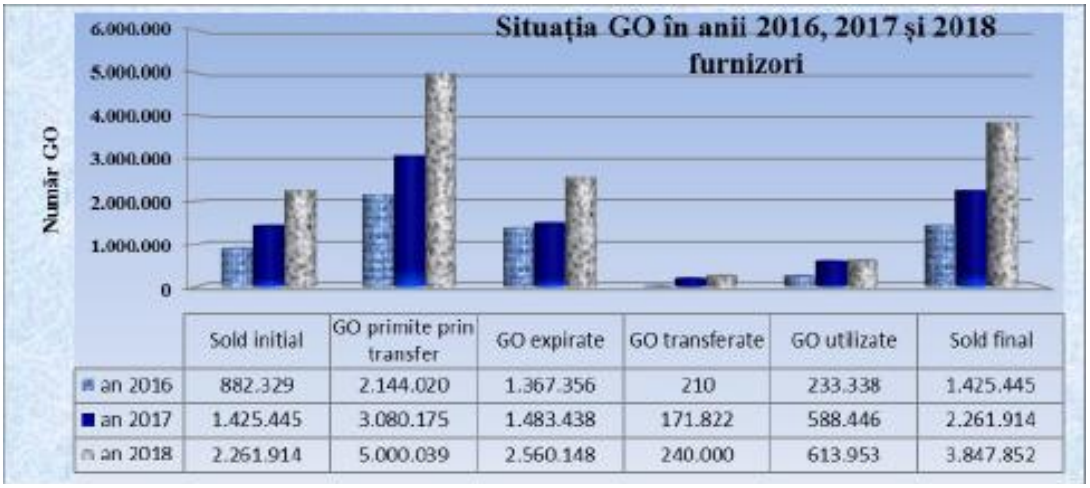
	Sold initial	Emise	Expirate	Transferate	Sold final
an 2016	19.726.935	16.636.255	20.941.290	2.143.810	13.278.090
an 2017	13.278.090	13.903.382	14.510.758	2.908.353	9.762.361
an 2018	9.762.361	14.843.568	10.328.656	4.760.039	9.517.234

RO	***EN***
Situația GO în anii 2016, 2017 și 2018	GO statement in 2016, 2017 and 2018
Număr GO	Number of GOs
An	Year
Sold inițial	Initial balance
Emise	Issued
Expirate	Expired
Transferate	Transferred
Sold final	Final balance

Figure 5.1: Statement of guarantees of origin in 2016, 2017, and 2018
Source: Reports on the monitoring of guarantees of origin for the electricity produced from renewable energy sources for 2018, ANRE 2019

- Compared to 2016 and 2017, when 233 338 and 588 446 guarantees of origin were used as per the notifications received by ANRE from electricity suppliers for use of guarantees of origin to final customers, the number of guarantees of origin used for final customers was 613 953 in 2018.

An improvement in the operations concerning the transfer and use of guarantees of origin has been recorded, so the number of both transferred and used guarantees of origin has been on an upward trend (**Figure 5.2**).



	Sold initial	GO primite prin transfer	GO expirate	GO transferate	GO utilizate	Sold final
an 2016	882.329	2.144.020	1.367.356	210	233.338	1.425.445
an 2017	1.425.445	3.080.175	1.483.438	171.822	588.446	2.261.914
an 2018	2.261.914	5.000.039	2.560.148	240.000	613.953	3.847.852

RO	*EN*
Situația GO în anii 2016, 2017 și 2018 furnizori	GO statement in 2016, 2017 and 2018 for suppliers
Număr GO	Number of GOs
An	Year
Sold inițial	Initial balance
GO primite prin transfer	GOs received by transfer
GO expirate	GOs expired
GO transferate	GOs transferred
GO utilizate	GOs used
Sold final	Final balance

Figure 5.2: **Statement of use of guarantees of origin to final customers**
Source: Report on the monitoring of guarantees of origin for the electricity produced from renewable energy sources for 2018. ANRE 2019

No requests were submitted in 2017 and 2018 for recognition of guarantees of origin issued by the authorities of other EU Member States.

ANRE did not receive any requests for the issue of guarantees of origin for the electricity intended for the pumping of water in the upper basin of a pumped storage power plant, nor for the electricity produced in multi-fuel power plants in 2016, 2017 and 2018.

6. The developments in 2017 and 2018 in the availability and use of biomass resources for energy purposes [Article 22(1)(g) of Directive 2009/28/EC]

Table 4: **Biomass supply for energy use**

	Quantity of domestic raw materials (thousands of tonnes)		**Primary energy in domestic raw materials (ktoe)**		**Quantity of raw materials imported from the EU (tonnes)**		**Primary energy from the raw materials imported from the EU (ktoe)**		**Quantity of material from third countries (tonnes)**		**Primary energy from the quantity of raw material imported from third countries (ktoe)**	
	2017	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
Biomass supply for heating and electricity:												
Indirect supply of wood biomass (residues and by-products from the wood industry etc.)	14 174	14 391	3 447	3 506	0	0	0	0	0	0	0	0
Energy crops (grass etc.) and fruit tree	8.0	8.2	3.2	3.3	0	0	0	0	0	0	0	0

	Quantity of domestic raw materials (thousands of tonnes)		Primary energy in domestic raw materials (ktoe)		Quantity of raw materials imported from the EU (tonnes)		Primary energy from the raw materials imported from the EU (ktoe)		Quantity of material from third countries (tonnes)		Primary energy from the quantity of raw material imported from third countries (ktoe)	
	2017	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
crops with rapid rotation (please elaborate) - energy willow - myscanthus												
Agricultural by-products/ processed residues and by-products from the fish industry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biomass from (municipal, industrial etc.) waste	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other (specify)	0	0	0	0	0	0	0	0	0	0	0	0
Biomass supply for transport:												
Shared arable crops for the production of biofuels (please specify the main types) - maize - sunflower + rape	475* 225 250	540* 240 300	339.8	386	0	0	0	0	0	0	0	0
Energy crops (grasslands etc.) and fruit tree crops with rapid rotation for the production of biofuels (please specify the main types)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quantity of domestic raw materials (thousands of tonnes)		Primary energy in domestic raw materials (ktoe)		Quantity of raw materials imported from the EU (tonnes)		Primary energy from the raw materials imported from the EU (ktoe)		Quantity of material from third countries (tonnes)		Primary energy from the quantity of raw material imported from third countries (ktoe)	
	2017	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
Other (specify)	0	0	0	0	0	0	0	0	0	0	0	0

*Note: *Total production of raw materials (thousands of tonnes) for biofuels and contained primary energy is reported, whether or not the obtained biofuels meet the sustainability criteria*

Source: National Statistics Institute - Energy Balance Sheet

In 2017, the domestic production of wood biomass (firewood, including biomass) was 14 636 thousand tonnes and 3 564 ktoe respectively, which is higher than domestic consumption (14 174 thousand tonnes and 3 447 ktoe respectively). Certain import quantities (532 thousand tonnes and 127.7 ktoe respectively), export quantities (189 thousand tonnes and 46.4 ktoe respectively) and changes in stocks, with export surpluses were recorded. Under those conditions, domestic production fully covered domestic consumption.

In 2018, the domestic production of wood biomass (firewood, including biomass) was 14 991 thousand tonnes and 3 564 ktoe respectively, which is higher than domestic consumption (14 391 thousand tonnes and 3 506 ktoe respectively). Certain import quantities (560 thousand tonnes and 134.5 ktoe respectively), export quantities (230 thousand tonnes and 55 ktoe respectively) and changes in stocks, with export surpluses were recorded. Under those conditions, domestic production fully covered domestic consumption.

Table 4.a.: **Current use of national agricultural land for crop production dedicated to production of energy (thousand ha)**

Land use	Area (thousand ha)	
	2017	**2018**
1. Land used for shared arable crops	**6 218.8**	**6 365.0**
Grain maize	2 402.1	2 439.8
Wheat	2 052.9	2 116.2
Potatoes	167.4	169.3
Sunflower	998.4	1 007.0
Rape	598.0	632.7
2. Land use for fast rotating trees	**4.60**	**4.42**
Energy willow	0.65	0.68
Energy poplar	2.52	2.33
Princess tree (Paulownia)	1.37	1.38
Oil tree (Jatropha)	0.06	0.03
3. Land used for other energy crops, such as grasslands	**0.97**	**1.04**
Sorghum	0.39	0.47
Myscanthus	0.58	0.57

Source: For point 1, the National Statistics Institute.
For points 2 and 3, the Paying and Intervention Agency for Agriculture

In dynamic terms, with reference to the reporting from previous years, a relative maintenance of the land use for shared arable crops and, at an early stage, the use of land for energy crops have been noticed.

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

The 2018 Statistical Directory shows that there were 3 422 thousand agricultural holdings in Romania in 2016, which was by approximately 12 % below the number resulting from the General Agricultural Census in 2010.

The following agricultural holdings were operational in 2016:

- 3 395 925 holdings without legal personality (3 379 883 individual agricultural holdings, 16 042 familiar businesses); the average size of an agricultural holding without legal personality was approximately 2.08 ha;
- 26 101 holdings with legal personality (60 self-governing companies, 1 147 agricultural companies/associations, 13 358 companies, 3 020 public administration units, 50 cooperative units, and 8 466 other types); the average size of an agricultural holding with legal personality was approximately 217.4 ha.

The 2010 census showed that the unused agricultural area at national level was 896 thousand ha and the standstill agricultural area was 953 thousand ha.

As regards the use of cultivated lands, the developments in the period 2008-2018 are shown in **Table 7.1**.

Table 7.1: **Trend in the cultivated area in the period 2008-2012 [thousand ha]**

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018[1]**
Total cultivated area, from which:	7 798	7 884	7 807	8 082	8 058	8 167	8 234.4	8 244.4	8 409.2	8 307.3	8 466.7
cereals for beans, of which:	5 211	5 282	5 041	5 225	5 440	5 421	5 443.2	5 463.6	5 487.0	5 192.3	5 257.2
wheat	2007	2 149	2 162	1 947	1 998	2 104.0	2 112.9	2 106.8	2 137.7	2 052.9	2 116.2
grain maize	7 777	2 339	2 098	2 590	2 730	2 518.3	2 512.8	2 604.5	2 581.0	2 402.1	2 439.8
roots, of which:	298	297	282	279	266	246	243.8	225.1	220.4	206.0	210.0
potatoes	255	255	241	243	224	203.4	198.5	185.9	182.2	167.4	169.3
industrial plants, of which:	1 251	1 269	1 431	1 490	1 272	1 436	1 504.0	1 544.1	1 638.4	1 775.1	1 839.0
oil plants, of which:	1 239	1 254	1 410	1 473	1 261	1 427	1 496.5	1 514.7	1 629.5	1 766.1	1 809.2
sunflower	814	766	791	995	1 067	1 074.6	1 001.0	1 011.5	1 039.8	998.4	1 007.0
rape	365	420	537	393	105	276.6	406.7	367.9	456.0	598.0	632.7

Note: [1] Estimation

Source: INS - Statistical Directory of Romania

It is noticeable that, in the period 2008-2018, the area planted with rape and ultimately intended for the production of biodiesel increased to 537 thousand hectares by 2010, after which it decreased to 393 thousand hectares in 2011, i.e. 105 thousand hectares in 2012. This area has grown from 2013 onward and in 2018 it reached approximately 633 thousand hectares. The total area, which was cultivated in the same period of time, has increased from 7 798 thousand hectares to 8 300 thousand hectares.

The Romanian agriculture is considered to offer important extensive and intensive development opportunities and it is difficult to raise the issue of limitations on food products introduced by the promotion of energy crops.

There is no information regarding price revisions in commodities resulting from the use of biomass and other renewable energy sources.

8. Development and share of biofuels made from wastes, residues, non-food cellulosic material, and lignocellulosic material [Article 22(1)(i) of Directive 2009/28/EC].

Table 5: **Developing biofuels (ktoe)**

Feedstock as listed in Annex IX Part A of Directive 2009/28/EC	**Year 2017**	**Year 2018**
(a) Algae if cultivated on land in ponds or photobioreactors		
(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		
(c) Bio-waste 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		
(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		
(e) Straw		
(f) Animal manure and sewage sludge		
(g) Palm oil mill effluent and empty palm fruit bunches		
(h) Tall oil pitch		
(i) Crude glycerine		
(j) Bagasse		
(k) Grape marcs and wine lees		
(l) Nut shells		
(m) Husks		
(n) Cobs cleaned of kernels of corn		
(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		
(p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2		
(q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs		
Feedstock as listed in Annex IX Part B of Directive 2009/28/EC	***2017***	***2018***
(a) Used cooking oil		
(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		

Difficulties still persist in Romania as regards the development of the necessary infrastructure for the extensive use of waste and the financing of support schemes that facilitate the introduction of expensive technologies, such as the biofuels referred to in Article 22(1).

The share of biofuels in the petrol traded in Romania has decreased from 5 to 4.5 % since 1 January 2014 in accordance with Government Decision No 1121/18 December 2013. For gas oil, the biodiesel share remained at 5 % until 1 January 2016 when it increased to 6.5 %. The share of biodiesel in gas oil should have reached 6 % as early as the beginning of 2013, however, in the autumn of 2012, oil

companies reported that they had not prepared the necessary infrastructure to switch to the new recipes, at the same time expressing their suspicions as regards the potential problems they are likely to create for older engines. If the 6 % had been reached, oil companies should have had to place two types of petrol on the market: one for newer vehicles that allow for such a share of biocomponents, and one for older vehicles.

There are issues that may give rise to malfunctions on the fuel market, including the existence of technical obstacles detected in the use of this type of petrol by the vehicles in use, which had been generally produced before 2000; however, the structure of the vehicle fleet concerned is heterogeneous and differs by manufacturer of motor vehicles. This constitutes an objective situation the detrimental effects of which on consumers, fuel suppliers and manufacturers and importers of motor vehicles should be reduced accordingly.

Government Decision No 931 of 20 December 2017 amending Article 1(1) of Government Decision No 935/2011 for promoting the use of biofuels and bioliquids, and amending Article 8(10) of Government Decision No 928/2012 laying down conditions for the placing on the market of petrol and gas oil and introducing a mechanism for monitoring and reducing greenhouse gas emissions, provides as follows:

- from 1 January 2019, petrol with a minimum 8 % biofuel content in the volume;
- by 31 December 2020, suppliers must reduce in a phased manner the greenhouse gas emissions generated during the life cycle per fuel power unit and the energy supplied by up to 6 % relative to the greenhouse gas emissions generated during the life cycle, complying with the following interim target values: 2 % by 31 December 2014 and 4 % by 31 December 2017.

Government Emergency Order No 80/2018 laying down the conditions for the placing on the market of petrol and gas oil, introducing a mechanism for monitoring and reducing greenhouse gas emissions and establishing the methods for calculation and reporting of reductions in greenhouse gas emissions, and amending Law No 220/2008 establishing the system for promoting production of energy from renewable energy sources, provides as follows:

- In order to achieve the target laid down in Article 9(1), fuel suppliers shall sell to the final customer only petrol with the following biofuel content:
    i. by 31 December 2018, petrol with a minimum 4.5 % biofuel content in the volume;
    ii. from 1 January 2019, petrol with a minimum 8 % biofuel content in the volume.
- In accordance with Article 9(1): By 31 December 2020, suppliers must reduce the greenhouse gas emissions generated during the life cycle per fuel power unit and the energy supplied by up to 10 %, but not less than 6 %, relative to the greenhouse gas emissions generated during the life cycle per fossil fuel power unit in 2010, having as a reference the fuel standard afferent to that period.
- In accordance with Article 9(2): The maximum contribution of biofuels produced from cereal and other starch crops, from sugar and oil crops and from main crops grown on agricultural lands for energy purposes to achieve the target provided in paragraph (1) shall be 7 % of the final consumption of energy in transport in 2020.

Some provisions introduced in 2012 regarding the reduction in the mandatory quotas set for biofuels in petrol and gas oil sold at gas station, for the biofuels in waste, residues, non-food cellulosic material,

and lignocellulosic material, among other factors, have led to the emergence of the first applications for production of biofuels from food waste in Romania in 2013.

9. The estimated impact of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality in 2017 and 2018 [Article 22 (1)(j) of Directive 2009/28/EC]

In the context of harmonisation of the Romanian law with the Union law and in order to harmonise the legislative framework in the field of transport, energy and air quality, Government Decision No 935/2011 on the promotion of the use of biofuels and bioliquids, as subsequently amended and supplemented, and Government Decision No 928/2012 laying down conditions for the placing on the market of petrol and gas oil and introducing a mechanism for monitoring and reducing greenhouse gas emissions, as subsequently amended and supplemented, were adopted.

Government Decision No 935/2011 transposed into the national law:

- Articles 1, 3(4) and 4 of Directive 2003/30/EC of the European Parliament and of the Council on the promotion of the use of biofuels or other renewable fuels for transport;
- Article 2(m), (n) and (o), Articles 17, 18, 19, 21, and 26(3) of Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (hereafter Directive 2009/28/EC). The general provisions of Directive 2009/28/EC are transposed by Law No 220/2008 establishing the system for promoting the production of energy from renewable energy sources, as republished, as subsequently amended and supplemented.

Government Decision No 928/2012, as subsequently amended and supplemented, transposes the following into the national law:

- Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC;
- Directive 2003/17/EC of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels;
- Directive 2009/30/EC of the European Parliament and of the Council amending Directive 98/70CE as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions;
- Commission Directive 2011/63/EC amending, for the purpose of its adaptation to technical progress, Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels;
- Commission Directive 2014/77/EC amending Annexes I and II of Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels.

Government Decision No 935/2011 thus established binding national targets for the share of energy from renewable sources used in transport and the sustainability criteria for biofuels and bioliquids with the purpose of promoting the use of biofuels and other renewable fuels to complete petrol or diesel fuels in order to contribute to the fulfilment of climate change commitments, to ensuring security of supply of the petrol and diesel produced under environmentally friendly conditions, and to the promotion of the use of renewable energy sources.

The aim of Government Decision No 928/2012 was to reduce greenhouse gas emissions from the use of petrol and diesel during their life cycle with a view to mitigating their negative effects on human

health and the environment by laying down technical specifications, based on health and environmental considerations, for the petrol and diesel fuels used in vehicles equipped with positive-ignition and compression-ignition engines, taking into account the technical requirements of these engines.

Given the ongoing development of the ambitious targets of the European Union and of the methods employed to achieve them, two new directives were adopted in 2015, namely:

- Directive 2015/652/EC lays down rules on calculation methods and reporting requirements in accordance with Directive 98/70/EC and applies to fuels used for the propulsion of road vehicles, non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors and recreational craft when not at sea, and electricity for use by road vehicles.
- Directive 2015/1513/EC requires amendments to these Directives in order for each Member State to ensure the share of energy from renewable sources, in all means of transport in 2020, of at least 10 % of the final consumption of energy in transport in that Member State. In order to achieve this target, the use of mixture of biofuels and the increase in the energy efficiency in the transport sector is foreseen, which is imperative because a mandatory percentage target for energy from renewable sources is likely to become increasingly difficult to achieve sustainably if overall demand for energy for transport continues to rise. Therefore, given the importance of energy efficiency also as regards the reduction in the greenhouse gas emissions, Member States and the Commission are encouraged to include more detailed information on energy efficiency measures in the transport sector in their reports to be submitted.

Member States must carry out full monitoring and reporting of the intensity of greenhouse gases generated by transport fuels in accordance with Directive 2015/652/EC, the deadline for transposition of which was 21 April 2017. It is noteworthy that the deadline for transposition of Directive 2015/1513/EC was 10 September 2017.

With the obligation to transpose Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels, and Directive (EU) 2015/1513 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, the complexity of the scope of Government Decision No 935/2011 and Government Decision No 928/2012 has been extended and developed.

The two directives were transposed into the national law by Government Emergency Order (GEO) No 80/2018 establishing the conditions for the placing on the market of petrol and diesel, introducing a mechanism for monitoring and reducing greenhouse gas emissions and establishing the methods for calculating and reporting the saving of greenhouse gas emissions.

In accordance with Article 9 of GEO No 80/2018, the following provisions are laid down for fuel suppliers:
(1) By 31 December 2020, suppliers must reduce the greenhouse gas emissions generated during the life cycle per fuel power unit and the energy supplied by up to 10 %, but not less than 6 %, relative to

the greenhouse gas emissions generated during the life cycle per fossil fuel power unit in 2010, having as a reference the fuel standard afferent to that period.
(2) The maximum contribution of biofuels produced from cereal and other starch crops, from sugar and oil crops and from main crops grown on agricultural lands for energy purposes to achieve the target provided in paragraph (1) shall be 7 % of the final consumption of energy in transport in 2020.
(3) Suppliers must compare the savings they have achieved in the greenhouse gas emissions generated during the life cycle by fuels and electricity with the fuel standard listed in Annex 5 to this Government Emergency Order.
(4) A group of suppliers may decide to comply jointly with the greenhouse gas emission saving obligations set out in paragraph 1 of this Emergency Order, in which case they shall be considered as a single supplier.
(5) A group of suppliers that opt for the qualification referred to in paragraph 4 shall notify individually the competent authority at least 60 days before submitting the report referred to in Article 8(5) of this Emergency Order.
(6) In order to achieve the target of reducing greenhouse gas emissions, as set out in paragraph 1, fuel suppliers shall sell to the final customer, as from 1 January 2019, petrol with a minimum 8 % biofuel content in the volume and diesel with a minimum 6.5 % biofuel content in the volume.
(7) By way of exception from paragraph 6, it is permissible to place on the market quantities of petrol and diesel without a biofuel component intended solely for use to supply motor vehicles when exiting the assembly line.

In accordance with Article 11 of GEO No 80/2018, only biofuels produced from raw materials that meet the sustainability criteria are allowed to be placed on the market and marketed. These criteria are:

a. The greenhouse gas emission saving from the use of biofuels, compared to greenhouse gas emissions from the use of fossil fuels, shall be at least 60 % for biofuels produced in installations starting operation after 5 October 2015. An installation shall be considered to be in operation if the physical production of biofuels has taken place.

b. Biofuels produced in installations which were operational on or before 5 October 2015 must achieve greenhouse gas emission savings of at least 50 %.

c. Biofuels may not be produced from raw material obtained from land with high biodiversity value, namely, land that had one of the following statuses from 1 January 2008 onward, whether or not these situations are still valid:

- forests classified into the functional group I - forests with special protection features, in accordance with Law No 46/2008 - the Forestry Code, as republished, as subsequently amended and supplemented;
- areas designated by the law or by the environmental protection authority for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the International Union for Conservation of Nature, unless evidence is provided that the production of that raw material

  did not interfere with those nature protection purposes;
- highly biodiverse grassland, such as grassland that would remain grassland in the absence of human intervention and which maintains the natural species composition and ecological characteristics and processes or non-natural highly biodiverse grassland that would cease to be

grassland in the absence of human intervention and which is species-rich and not degraded, unless evidence is provided that the harvesting of the raw material is necessary to preserve its

grassland status.

d. Biofuels taken into account for the purpose of saving greenhouse gas emissions shall not be made from raw material obtained from land with high carbon stock, namely, land that had one of the following statuses in January 2008 and no longer has that status:

- wetlands, namely, land that is covered with or saturated by water permanently or for a significant part of the year;
- continuously forested areas, namely land spanning more than one hectare with trees higher than five metres and a canopy cover of more than 0.3 or trees able to reach those thresholds in situ;
- land spanning more than one hectare with trees higher than five metres when fully grown and a canopy cover between 0.1 and 0.3 or trees able to reach those thresholds in situ, unless evidence is provided that the carbon stock of the area before and after conversion is such that, when the methodology laid down in Part C of Annex 6 to this Emergency Order is applied, the conditions laid down in points (a) and (b) would be fulfilled;

e. Biofuels may not be made from raw material obtained from land that was peatland on 1 January 2008, unless evidence is provided that the cultivation and harvesting of that raw material does not involve drainage of previously undrained soil.

f. Agricultural raw materials cultivated and used for the production of biofuels shall be obtained in accordance with the minimum requirements for good agricultural and environmental condition set out in Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009.

The protection of biodiversity, water resources and soil is covered by GEO No 80/2018.

10. The estimated net greenhouse gas savings due to the use of energy from renewable sources. [Article 22(1)(k) of Directive 2009/28/CE]

Table 6: **Estimated greenhouse gas emission saving due to the use of energy from renewable sources (thousand $tCO_{2\ eq.}$)**

Environmental issues	2017	2018*
Total estimated net GHG emission saving from using renewable energy	**40 846**	**44 879**
- Estimated net GHG saving from the use of renewable electricity	26 391	30 131
- Estimated net GHG saving from the use of renewable energy in heating and cooling	13 290	13 502
- Estimated net GHG saving from the use of renewable energy in transport	1 165	1 246

*Note: *Estimated values*

In order to calculate the net GHG emission savings from the use of electricity from renewable sources, data provided by INS in the National Energy Balance Sheets submitted by Romania to the international institutions EUROSTAT/IEB/UNECE in 2017 was used. For the electricity produced from hydropower and wind power sources, the actual quantities produced in 2017 and 2018 were used, not the normalised quantities.

The CO_{2eq} emission savings for the production of electricity, i.e. heat for heating/cooling, were estimated by taking into account the fact that RES replace solid fuel (lignite).

The efficiency used to determine energy consumption values is the average of the values reported in the Energy Balance for the production of electricity and heat, for the corresponding type of fuel, namely, for lignite: in the production and self-production of electricity (main activity and cogeneration) - 30 %; in the production of heat (main activity and cogeneration) - 65 %; in the self-production of heat (main activity and cogeneration) - 40 %; in the production of heat for heating/cooling in the industry and other sectors, the CO_2 emission savings were estimated based on the energy consumption. The GHG emission savings through the use of biomass in transport were estimated by taking into account the fact that it replaces diesel.

The emission factors that were used are peculiar to Romania, being taken from INEGES and submitted to the European Environment Agency and the European Commission in May 2019 for 2017, more specifically 89.25 CO_2 [t/TJ] for lignite and 82.44 CO_2 [t/TJ] for diesel.

11. Reporting 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, as well as 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 compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Romania (ktoe).**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual/estimated excess/deficit production of electricity from RES	186	145	17	-13	42	82	66	-5	-53	-71	0	0
Actual/estimated excess or deficit production from RES for heating and cooling	1 234	1 365	980	1 088	1 161	1 284	1 161	1 252	1 047	935	540	0
Actual/estimated excess or deficit production of energy from RES in transport	-213	-214	-173	-101	-89	-156	-136	-125	-136	-180	-101	0
Total	1 207	1 296	824	974	1 114	1 210	1 091	1 122	858	684	439	0

Source: data processed as per Tables A and B of this Chapter

Actual data from statistical reporting was used to determine the excess/deficit energy produced from renewable sources for 2009-2018.

The data regarding the gross final energy consumption achieved and the RES-E production relative to the indicative trajectory towards the target, which is adjusted to the actual final consumption, is listed in **Table A** below.

TABLE A: **Gross final consumption of energy achieved, consumption from RES-E adjusted to the indicative targets of the indicative trajectory, the sectoral indicative trajectory and the sectoral production from RES-E for determining the actual excess and/or deficit (-) consumption of energy from RES-E in the period 2009-2018 (ktoe)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gross final energy consumption achieved (ktoe)	23 707	24 046	24 416	24 401	23 352	23 261	23 437	23 785	24 685	24 964
Gross final consumption of energy from RES achieved as per the indicative trajectory: 1). % target										

2). (ktoe)	17.44 4 134	17.50 4 208	18.00 4 395	19.04 4 646	19.35 4 519	19.66 4 573	20.13 4 718	20.59 4 897	21.21 5 236	21.83 5 450
RES electricity production: 1). Indicative trajectory (ktoe)	1 287	1 379	1 592	1 717	1 782	2 000	2 131	2 193	2 235	2 265
2). Actual production (ktoe)	1 473	1 524	1 609	1 704	1 824	2 082	2 197	2 188	2 182	2 194
Production of energy for heating/ cooling from RES: 1). Indicative trajectory (ktoe)	2 545	2 602	2 524	2 600	2 390	2 245	2 248	2 255	2 508	2 533
2). Actual production (ktoe)	3 779	3 967	3 504	3 688	3 551	3 529	3 409	3 507	3 555	3 468
Gross final consumption of energy from RES: 1). Indicative trajectory (ktoe)	277	279	318	363	370	402	428	478	537	577
2). Actual consumption from national production (ktoe)	63.7	64.6	144.6	261.8	281.1	245.7	292.3	353.2	400.6	396.6

Source: Eurostat

Compared to the previous report and the estimates in the NREAP on the excess/deficit energy from renewable sources in Romania, the estimates for the period 2019-2020 were reviewed following new analysis elements occurred in the reported period, by taking into account the following elements:

- The gross final consumption of energy in the period 2010-2018 is below the consumption estimated in the NREAP, under the scenario of increased efficiency, by -7.0 % in 2010, by -7.65 % in 2011, by -9.48 % in 2012, by -15.1 % in 2013, by -17.0 % in 2014, by 18.1 % in 2015, by -17.79 % in 2016, by -15.69 % in 2017 and by -15.68 % in 2018.
- The capacities installed in power plants producing electricity from renewable energy sources have accelerated. The installed capacity in the power plants producing energy from renewable sources in 2018 is 3 032.9 MW in wind power plants, 1 385.9 MW in photovoltaic power plants, 342 MW in small hydropower plants (less than 10 MW) and 141.1 MW in biomass thermal power plants. According to the NREAP, in 2020 the installed capacity must be 4 000 MW in wind power plants and 320 MW in photovoltaic power plants.

Having regard to the above, with regard to the possibility of achieving excess/deficit production of energy from renewable sources compared to the indicative interim targets in the period 2019-2020, the underlying work assumptions are the following:

- The trend in the gross final energy consumption of energy (ktoe) corresponds to the data presented by the National Forecast Commission in the "Energy Balance Forecast" prepared in June 2019 for the period 2019-2022. The estimated trajectory of the gross final consumption (25 855 ktoe in 2020) is below the estimated energy consumption in the NREAP under the scenario of increased efficiency (30 278 ktoe in 2020).
- The production of energy from renewable sources was recalculated based on its share in the gross final energy consumption based on the indicative interim trajectory. The interim targets for the RES-E share in the final energy consumption are 22.92 % and 24 % for 2019 and 2020.

- Sectoral indicative trajectories were recalculated based on the new final consumption, the sectoral annual shares listed in the NREAP being maintained.
- The production of electricity from renewable sources for the period 2019-2020 was estimated by taking into account the normalised production value of hydro power plants above 10 MW and the investment programme in this sector; the installed capacities and capacities under installation at the end of 2019 for hydropower production technologies under 10 MW and for wind, solar and biomass production technologies; the capacity factors achieved by technology in 2018, as per the Monitoring Report of the ANRE; the incentive effect of the support schemes and grant co-financing programmes for investments.
- The biofuel production for the transport sector was estimated by taking into account the potential for the production of sustainable biofuels as well as the limitation of the biofuel consumption to the interim quotas and the final quota of 10 % in the annual fuel consumption projected for 2020.

The data obtained for the RES-E production estimation relative to the indicative trajectory for reaching the target of 24 % of the gross final energy consumption is set out in **Table B** below.

TABLE B: **Estimated gross final energy consumption, RES-E consumption estimated on the indicative trajectory, sectoral indicative trajectory and estimation of sectoral production from RES-E in order to determine the estimated excess and/or deficit (-) consumption of energy from RES-E compared to the indicative trajectory, which could be transferred to/from other Member States and/or third countries (ktoe)**

	2019	**2020**
Estimation of gross final energy consumption (ktoe)	25 445	25 855
Gross final consumption of energy from RES as per the indicative trajectory (ktoe)	5 832	6 206
Gross final consumption of electricity from RES: 1). Indicative trajectory (ktoe) 2). Estimated production (ktoe)	 2 281 2 281	 2 314 2 314
Gross final consumption of energy from RES for heating/cooling: 1). Indicative trajectory (ktoe) 2). Estimated production (ktoe)	 2 860 3 400	 3 136 3 136
Gross final consumption of energy from RES: 1). Indicative trajectory (ktoe) 2). Estimated production (ktoe)	 591 490	 621 621

The processing of the estimates for the period 2019-2020 has revealed that, every year in the analysed period, the estimated production of energy from RES is overall in excess of the gross final consumption of RES-E, which ensures that the interim and final targets for the share of RES-E in the final energy consumption are reached. The excess electricity from RES-E on the indicative trajectory may be subject to statistical transfers.

The excess of energy from RES in the heating/cooling sector is reflected in the annual excess of trade and in the increase in final stocks.

The deficit of energy from RES in the transport sector is reflected in the annual deficit of trade in sustainable biofuels.

11.1. Statistical transfers, joint projects and joint support scheme decision rules

Romania considers that it will achieve the overall 24 % target set for the share of RES-E in the gross final consumption of energy in 2020 without having recourse to transfer from other Member States. The total shares of consumption of energy from RES in the gross energy consumption in 2017 and 2018 are 24.45 % and 23.87 %, exceeding by far the shares set for the indicative trajectory of 21.83 % for the period 2017-2018.

For the electricity produced from RES, excess production is estimated for 2017-2018, which could be subject to statistical transfers. In the period 2017-2018, Romania neither established contacts, nor set procedures in place to enable them to realize statistical transfers.

In accordance with Article 10(3) of Law No 220/2008, until the national targets referred to in Article 4(2) regarding the share of electricity from RES that benefits from the promotion system in the gross final consumption of electricity have been reached, the green certificates promotion scheme is applicable only to cover the gross final consumption of electricity achieved by Romania.

The national targets for the share of electricity from RES in the gross final consumption of electricity, as defined in Article 4(2), are 33 % in 2010, 35 % in 2015 and 38 % in 2020. The promotion scheme does not include the energy obtained from hydropower plants with installed capacity above 10 MW, however the electricity produced in hydropower plants with capacities above 10 MW is taken into account for the achievement of national targets.

The Structural Funds and the national programmes currently provide significant opportunities for financial support in order to achieve investments for the harnessing of RES. The investments that will be thus achieved are estimated to be sufficient in order to ensure consistency with the indicative trajectory for production of energy from RES.

The volume of private investments in RES energy production installations increased significantly in the reporting years. No national procedures have been established yet for the development of joint projects.

Romania has engaged in the development of investment projects of the “Joint Implementation” type, by cooperating with different countries in order to achieve the technology transfer with a view to reducing greenhouse gas emissions, to increasing the energy efficiency of the facilities under these investments and to improving the quality of the environment.

The opportunity of joint projects on the national level will be reviewed in the light of developments in the actual harnessing of the national potential. The current relevant experience at EU level will be used to the maximum extent possible in the preparation of procedures for their implementation. Romania will also be able to use its own experience with the joint implementation of projects under the Kyoto Protocol.

12. Information on how the share for 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]

The National Waste Management Strategy for 2014-2020 was approved by Government Decision No 870 of 6 November 2013, as published in Part I of Official Gazette No 750 of 4 December 2013. This strategy provides the framework of measures to ensure the shifting from the development model based on production and consumption to a model based on waste prevention and the use of raw materials from the recovery industry, thus ensuring the preservation of national natural resources and paving the way for the reconciliation of economic and 'environmental' needs.

The National Waste Management Strategy 2014-2020 established the policy and strategic objectives of Romania for waste management on the short term (2015) and on the medium term (2020).

The National Waste Management Plan (NWMP), as approved by Government Decision No 942/20 December 2017, was prepared for the implementation of the strategy. This Plan also contains the National Waste Prevention Programme.

The National Waste Management Programme lays down objectives and targets for the period 2018-2025, the alternative chosen for the management of municipal waste, governance arrangements for the management of municipal waste, the action plan by county and for Bucharest Municipality. Moreover, the NWMP provides for measures to improve the effectiveness of existing waste management policy instruments.

For the purposes of this report, please note that the production of energy based on the biodegradable actions in waste was not reported in 2017 and 2018.

As regards the quantities of biodegradable waste generated in Romania, the National Waste Management Plan lists the quantities of municipal waste generated in Romania in the period 2010-2014 and the composition of this waste. The total quantity of municipal waste ranged from 6 343 thousand tonnes in 2010 to 4 956 thousand tonnes in 2014. Household waste accounts for 72-74 %, waste generated by economic operators and institutions accounts for 17-18 % and waste from public services accounts for 9-11 % of the total quantity of municipal waste.
Biodegradable waste accounts for approximately 55-60 % of the composition of household waste and waste similar to household waste collected by sanitation operators in the period 2010-2014.
The NWMP provides for programmes for energy recovery from biodegradable waste, however there have not been any feasible applications yet in Romania.

13. **The amounts 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 by Romania 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).**

Feedstock group	2017	2018
Cereals and other starch-rich crops		
Sugars		
Oil crops		

There is no official information regarding the amounts of biofuels and bioliquids produced by companies using cereals and other starch-rich crops, sugars and oil crops as feedstock in the period 2017-2018.

CONCLUSIONS

- Romania considers that it will achieve the overall 24 % target set for the share of RES-E in the gross final consumption of energy in 2020 without having recourse to transfer from other Member States. The total shares of consumption of energy from RES in the gross energy consumption in 2017 and 2018 are 24.45 % and 23.87 %, exceeding the shares set for the indicative trajectory of 21.83 % for the period 2017-2018. For the electricity produced from RES, excess production is estimated for 2017-2018, which could be subject to statistical transfers. Romania has currently neither established contacts, nor set procedures in place to enable them to realize statistical transfers.
- In accordance with Article 10(3) of Law No 220/2008, until the national targets referred to in Article 4(2) regarding the share of electricity from RES that benefits from the promotion system in the gross final consumption of electricity have been reached, the green certificates promotion scheme is applicable only to cover the gross final consumption of electricity from RES achieved by Romania.
- The national targets for the share of electricity from RES in the gross final consumption of electricity, as defined in Article 4(2) of Law No 220/2008, as subsequently amended and supplemented, are 33 % in 2010, 35 % in 2015 and 38 % in 2020. The promotion scheme does not include the electricity produced in hydropower plants with installed capacity above 10 MW. The electricity produced in hydropower plants with capacities above 10 MW is taken into account for the achievement of national targets.
- The volume of private investments in RES energy production installations increased significantly in the reporting years. No national procedures have been established yet for the development of joint projects.
- Romania has engaged in the development of investment projects of the “Joint Implementation” type, by cooperating with different countries in order to achieve the technology transfer with a view to reducing greenhouse gas emissions, to increasing the energy efficiency of the facilities under these investments and to improving the quality of the environment.
- The opportunity of joint projects within the Romanian territory will be reviewed in the light of developments in the actual harnessing of the national potential. The current relevant experience at EU level will be used to the maximum extent possible in the preparation of procedures for their implementation. Romania will also be able to use its own experience with the joint implementation of projects under the Kyoto Protocol.
- The Government of Romania sustains the use of energy from renewable sources as part of the objectives of the national energy strategy, namely sustainable development and energy security.

LITERATURE

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gas emissions and establishing the methods for calculation and reporting of reductions in greenhouse gas emissions, and amending Law No 220/2008 establishing the system for promoting production of energy from renewable energy sources;

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17. Government Decision No 942/2017 approving the National Waste Management Plan
18. Order No 4/2015 of ANRE approving the Regulation on the issue of green certificates, as subsequently amended and supplemented, which was amended and supplemented in 2018 by Order No 163/2018 of ANRE;
19. Order No 41/2016 of ANRE approving the Methodology for establishing the mandatory annual quotas for the electricity produced from renewable energy sources, which benefits from the green certificates promotion system and the green certificates purchase quotas.
20. Order No 52/2016 of ANRE approving a Methodology for monitoring the system for the promotion of energy from renewable sources through green certificates;
21. Order No 78/2017 of ANRE approving the Methodology for establishing the annual static quantity of green certificates and the annual mandatory quotas of green certificates to be purchased;
22. Order No 157/2018 of ANRE approving the Methodology for determination of the annual mandatory quotas of green certificates to be purchased repealing Order No 78/2017 of ANRE;
23. Order No 77/2017 of ANRE approving the Rules for organisation and functioning of the green certificates market, as subsequently amended and supplemented, as approved by Order No 65/2018 of ANRE, and Order No 178/2018;
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ACRONYMS

ANRE	The Romanian Energy Regulatory Authority
PA	Priority Axis
TCA	Technical connection approval
S1	Market share of the largest producer of RES-E, which is a beneficiary of GCs
WPP	Wind power plant
PSHP	Pumped-storage hydropower plant
CNTEE TRANSELECTRICA SA	The National Electricity Transmission Company
CNP	The National Forecast Commission
NPP	Nuclear power plant
GC	Green certificate
RES-E	Electricity produced from renewable energy sources
ENTSO-E	The European Network of Transmission System Operators for Electricity
ETBE	Ethyl tert-butyl ether
GO	Guarantee of origin
GD	Government Decision
INEGES	National Inventory of Greenhouse Gas Emissions
INS	The National Statistics Institute
MARD	Ministry of Agriculture and Rural Development
MHPP	Micro-hydropower plants
NA	not available
DO	Distribution operator
GO	Government Order
GEO	Government Emergency Order
OPCOM	Operator of the Electricity and Natural Gas Market
GCMO	Green Certificates Market Operator
SO	Specific objective
TSO	Electricity Transmission and System Operator
GCM	Green Certificates Market
GCBCM	The Green Certificates Bilateral Contracts Market
DN-GCBCM	The directly negotiated green certificates bilateral contracts market
CGCM	The Centralised Green Certificates Market
CSGCM	The centralised anonymous spot green certificates market
CFGCM	The centralised anonymous forward green certificates market
GDP	Gross Domestic Product
NREAP	The National Renewable Energy Action Plan
LIOP	The Large Infrastructure Operational Programme
ROP	The Regional Operational Programme

EDG	The Electricity Distribution Grid
ETG	The Electricity Transmission Grid
NES	The National Energy System
RES	Renewable Energy Sources
RES-H&C	Consumption of energy produced from renewable sources for heating and cooling
RES-E	Consumption of electricity produced from renewable resources
RES-T	Consumption of energy produced from renewable sources for transport
EU	The European Union