REPÚBLICA PORTUGUESA
AMBIENTE E AÇÃO CLIMÁTICA

Direção-Geral de Energia e Geologia

FIFTH PROGRESS REPORT
(2017-2018)

Submitted pursuant to Article 22 of Directive 2009/28/EC

National Renewable Energy Action Plan
(NREAP)

Portugal

January 2020

BACKGROUND

In accordance with Article 22 of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Portugal presents its fifth report on progress made in terms of the promotion and use of energy from renewable sources during the years 2017 and 2016, based on the measures contained in the National Renewable Energy Strategy adopted in 2013, which established the National Renewable Energy Action Plan (NREAP 2020).

In the period under analysis (2017-2018), Portugal remained fully committed to its medium- to long-term policy, creating conditions for smart, sustainable and inclusive growth. It continued to promote renewable energies as part of an energy model based on economic rationality and sustainability, combining the adoption of energy efficiency measures and the use of energy from renewable endogenous sources to achieve the target of renewable energies, while also working to reduce the additional costs that inflate energy prices so as to ensure that the goal of incorporating 31% of renewable energies in the gross final energy consumption could be met by 2020, thus helping to reduce the country's energy dependence and guaranteeing security of supply by promoting a balanced energy mix and reducing CO2 emissions while also working to reduce the additional costs that inflate energy prices.

As part of the commitment undertaken for 2020 as regards the integration of RES (renewable energy sources) in GFEC (gross final energy consumption), Portugal attained 30.6% in 2017 and 30.3% in 2018, figures which correspond to 99% and 98% of the target 31% by 2020, as shown in Figure 1. We would like to emphasise that compared to previous reports, the contribution of renewables towards heating via heat pumps has been added, in accordance with Directive 2009/28/EC and the guidelines established in Commission Decision of 1 March 2013. The values from 2014 onwards have also been corrected.

Figure 1- Trends in the global objective of percentage of RES as a share of final energy consumption (*Source:* DGEG)

As regards the integration of RES in final energy consumption in transport, Portugal attained 7,9% in 2017 and 9.0% in 2018, which corresponds to 79% and 90% of the target 10% by 2020, as shown in Figure 2.

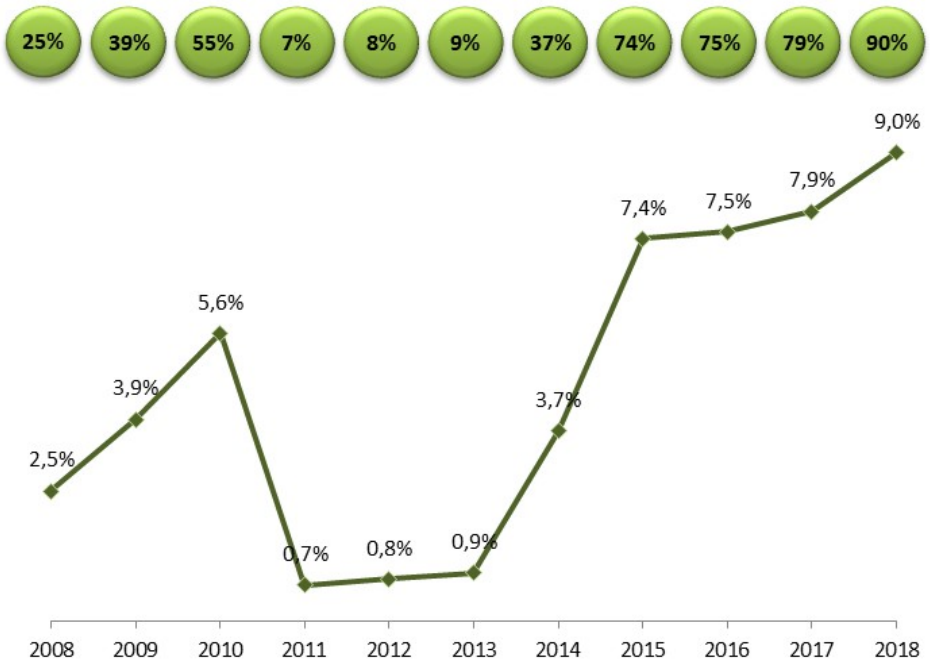

Figure 2- Trends in the global objective of percentage of RES as a share of consumption of energy in the transport sector (*Source:* DGEG)

The sudden drop in the RES share in transport from 2011 onwards is due to the fact that when Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 came into force, it was only possible to count the quantities of biofuels that met the sustainability criteria specified in the Directive. The system for verifying compliance with the sustainability criteria only came into force in Portugal from the second half of 2014 onwards. Only biofuels from waste were counted between 2011 and the first half of 2014.

An estimated 427,000 biofuel vouchers (BVs) were issued[1] for the quantities of biofuels produced and imported in 2018, of which around 161,000 were subsidised. It should be noted that the current wording of Decree-Law No 117/2010 of 25 October 2010 allows for one subsidised BV (i.e. 1 additional BV) to be allocated for each toe of biofuel produced from the raw materials listed in Annex IV.

[1] *Source:* Report on Compliance with Sustainability Criteria in Producing and Importing Biofuels in Portugal – 2018 (LNEG/ECS)

This information on the issue of biofuel vouchers takes into account the statements made to the ECS (Entidade Coordenadora do Cumprimento dos Critérios de Sustentabilidade dos Biocombustíveis – or Sustainability Criteria Compliance Coordinating Body) by economic operators, producers and importers of biofuels, in accordance with the provisions of Decree Law No 117/2010 of 25 October 2010 and Portaria [Ministerial Implementing Order] No 8/2012 of 4 January 2012.

The target for incorporating biofuels established in Article 11 of Decree-Law No 117/2010 of 25 October 2010 was kept at 7.5% in terms of energy content for the years 2017 and 2018, following the derogations provided for in the State Budget Laws for 2017 and 2018 (Law No 42/2016 of 28 December 2016 and Law No 114/2017 of 29 December 2017).

In global terms, the trends seen until 2018 in these three sectors (renewable electricity, heating and cooling and transport) are shown below in Figure 3.

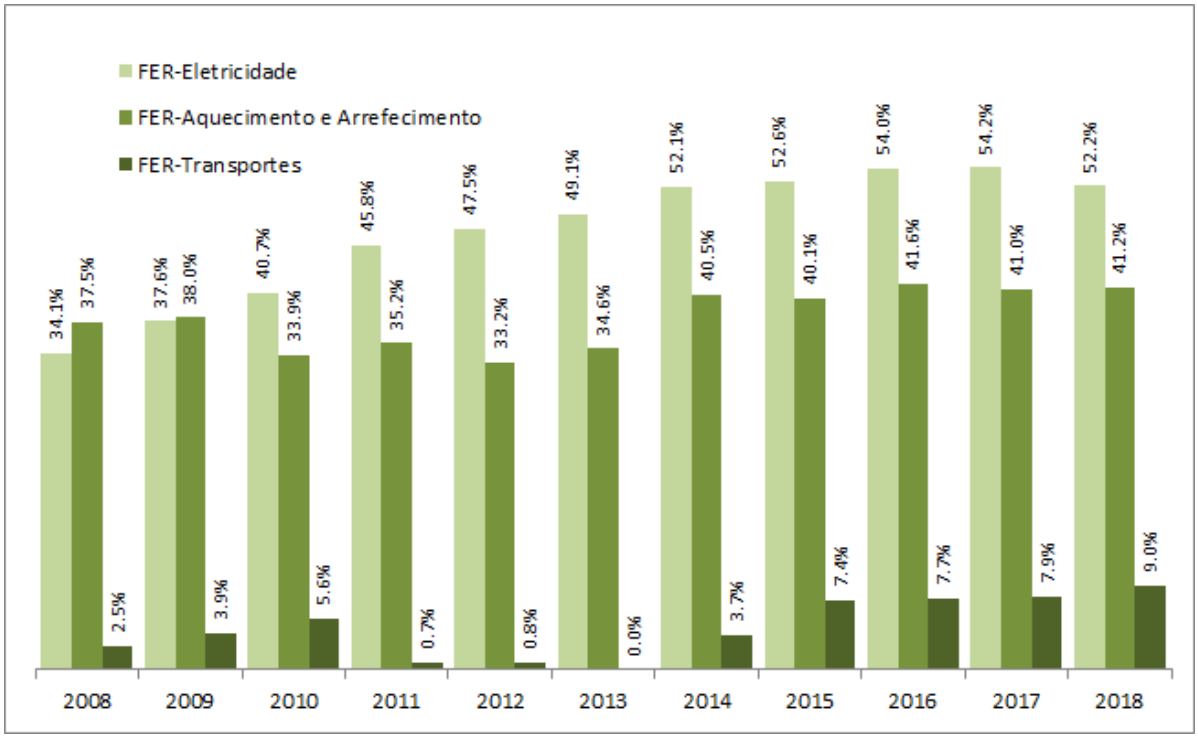

Figure 3 - Trends in the share of renewable energy in the consumption of energy in the three sectors (*Source:* DGEG)

1. Sectoral and overall shares and actual consumption of energy from renewable sources in 2017 and 2018 *(Article 22 (1) a of Directive 2009/28/EC).*

Table 1:

Sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources[2]

	2017	2018
RES-H&C[3] (%)	41.02%	41.21%
RES-E[4] (%)	54.17%	52.19%
RES-T[5] (%)	7.91%	9.04%
Overall RES share[6] (%)	**30.61%**	**30.32%**
Of which from cooperation mechanism[7] (%)	0.00%	0.00%
Surplus for cooperation mechanism[8] (%)	not available	not available

Table 1 a:

Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)[9]

	2017	2018
(A) Gross final consumption of RES for heating and cooling	2,520.5	2,576.4
(B) Gross final consumption of electricity from RES	2,540.3	2,478.6
(C) Gross final consumption of energy from RES in transport	264.1	304.2
(D) Gross total RES consumption[10]	**5,324.9**	**5,359.2**
(E) Transfer of RES to other Member States	0.0	0.0
(F) Transfer of RES from other Member States and 3rd countries	0.0	0.0
(G) RES consumption adjusted for target (D)-(E)+(F)	**5,324.9**	**5,359.2**

2 Facilitates comparison with Table 3 and Table 4a of the NREAP.
3 Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)(b) and 5(4) of Directive 2009/28/EC divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAP applies.
4 Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Article 5(1)(a) and Article 5(3) of Directive 2009/28/EC divided by total gross final consumption of electricity. The same methodology as in Table 3 of NREAP applies.
5 Share of renewable energy in transport: final energy from renewable sources consumed in the transport sector (cf. Article 5(1)(c) and Article 5(5) of Directive 2009/28/EC divided by the consumption in transport of: 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). The same methodology as in Table 3 of NREAP applies.
6 Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAP applies.
7 In percentage points of overall RES share.
8 In percentage points of overall RES share.
9 Facilitates comparison with Table 4a of the NREAP
10 In accordance with Article 5(1)of Directive 2009/28/EC, gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

Table 1b:

Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in [Member State] to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the electricity sector[11]

	2017		2018	
	MW	**GWh**	**MW**	**GWh**
Hydro-electric[12]:	7,225.9	7,632	7,235.8	13,628
non pumped	4,461.5	5,032	4,471.4	10,458
<1MW	not available	not available	not available	not available
1MW–10 MW	not available	not available	not available	not available
>10MW	not available	not available	not available	not available
pumped	0.0	0	0.0	0
mixed:[13]	2,764,4	2,600	2,764,4	3,170
Geothermal	29.1	216.7	29.1	230.4
Solar:	579.2	991.5	667.4	1,005.9
Photovoltaic	579.2	991.5	667.4	1,005.9
Concentrated solar power	0.0	0.0	0.0	0.0
Tide, wave, ocean	0.4	0.0	0.4	0.0
Wind:	5,124.1	12,247.9	5,172.4	12,616.6
Onshore	5,124.1	12,247.9	5,172.4	12,616.6
Offshore	0.0	0.0	0.0	0.0
Biomass[14]:	541.3	2,860.0	607.2	2,829.0
Solid biomass	471.2	2,573.5	535.9	2,557.6
Biogas	70.1	286.5	71.2	271.4
Bioliquids	0.0	0.0	0.0	0.0
GRAND TOTAL	**13,500.1**	**29,439.3**	**13,712.3**	**28,764.1**
Of which in CHP	not available	1,791.7	not available	1,734.8

Note: The power associated to the installed capacity corresponds to the maximum power values as reported to Eurostat

[11] Facilitates comparison with Table 10a of the NREAP.
[12] Standardised production in accordance with Directive 2009/28/EC and Eurostat methodology.
[13] In accordance with the new Eurostat methodology.
[14] Only considers those meeting the applicable sustainability criteria (see the final paragraph of Article 5(1) of Directive 2009/28/EC).

Table 1c:

Total actual contribution (final energy consumption)[15]) from each renewable energy technology in [Member State] to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in <u>heating and cooling</u> (ktoe)[16]

	2017	2018
Geothermal (excluding low temperature geothermal heat in heat pump applications)	1.6	1.7
Solar	88.0	94.4
Biomass[17]:	1,806.8	1,830.6
Solid biomass	1,798.8	1,822.8
Biogas	8.0	7.8
Bioliquids	0.0	0.0
Renewable energy from heat pumps:	624.1	649.6
- of which aerothermal	624.1	649.6
- of which geothermal	0.0	0.0
- of which hydrothermal	0.0	0.0
GRAND TOTAL	**2,520.5**	**2,576.4**
Of which DH[18]	not available	not available
Of which biomass in households[19]	764.6	766.6

[15] Direct use and district heating as defined in Article 5(4) of Directive 2009/28/EC.
[16] Facilitates comparison with Table 11 of the NREAP.
[17] Only considers those meeting the applicable sustainability criteria (see the final paragraph of Article 5(1) of Directive 2009/28/EC).
[18] District heating and/or cooling as share of total consumption of heating and cooling from renewable energy sources (RES-DH).
[19] Of the total consumption for heating and cooling from renewable energies

Table 1d:

Total actual contribution from each renewable energy technology in Portugal to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)[20],[21]

	2017	2018
— Biogasoline (Bioethanol + Bio-EBTE)	2.95	5.60
— Biodiesel (FAME + HVO)	239.91	256.80
- Hydrotreated Vegetable Oil (HVO)	not available	not available
- Biomethane	0.00	0.00
- Fischer-Tropsch diesel	0.00	0.00
— Bio-ETBE	not available	not available
— Bio-MTBE	0.00	0.00
— Bio-DME	0.00	0.00
— Bio-TAEE	0.00	0.00
— Biobutanol	0.00	0.00
- Biomethanol	0.00	0.00
- Pure vegetable oil	0.00	0.00
Total sustainable biofuels	242.86	262.40
Of which		
sustainable biofuels produced from feedstock listed in Annex IX Part A	0.00	0.00
other sustainable biofuels eligible for the target set out in Article 3(4)(e)	0.00	0.00
sustainable biofuels produced from feedstock listed in Annex IX Part B	139.48	165.63
sustainable biofuels for which the contribution towards the renewable energy target is limited according to Article 3(4)(d)	101.51	109.98
Imported from third countries	0	0
Hydrogen from renewables	0	0
RES electricity	21.96	22.77
Of which		
consumed in road transport	0.10	0.25
consumed in rail transport	21.60	22.25
consumed in other transport sectors	0.26	0.27
Other (please specify)	0	0
Other (please specify)	0	0

[20] For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last paragraph.
[21] Facilitates comparison with Table 12 of 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 your National Renewable Energy Action Plan *(Article 22(1)(a) of Directive 2009/28/EC).*

Table 2:
Overview of all policies and measures

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
1. Defining the national territory in terms of geothermal resources and promoting the evaluation of the capacity of high-enthalpy geothermal energy and depth and of low-enthalpy geothermal energy in order to use the energy associated with aquifers (energy hydrogeology) or in geological formations.	Study	Mapping the capacity of national geothermal resources and promoting their use. Obtaining a tool for selecting the locations which are most suitable for installing projects for the use of geothermal resources.	Portuguese state and SCT	Existing	2012-2018
2. Promote the installation of thermal solar systems in the residential sector and in swimming pools and sports areas, and the renewal of thermal solar systems at the end of their useful life.	Financial FEE Notices 1 and 3	Residential: 76,200 toe in 2020 Services: 31,776 toe in 2020	End user (Residential, Services and the Portuguese State)	Existing	2003-2020
3. Create a national system for the registration of installers and small renewable systems for thermal purposes (solar thermal, heat pumps and biomass systems)	Regulatory	Better facilities, improved information for customers, establishment of a procedure for the collection of data for the NREAP.	Installers End user State	Existing	2013-2020
4. Promote the installation in buildings of more efficient environmentally friendly energy systems run on biomass for heating/air conditioning	Regulatory Financial	153,354 tep in 2020	End user (Residential and Services)	Existing	2010-2020

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
5. Introduction of a general remuneration system which enables producers of electricity from RES to carry out their activity in accordance with the terms included in the PRO	Regulatory	Stimulate investment in mature technologies with an order of merit which enables it to be carried out under market conditions	Renewable Energy Producer	Existing	2003-2020
6. Implementation of the role of market facilitator, required to acquire energy produced by electricity-producing centres using RES wishing to sell that energy under market conditions	Regulatory	Creating effective conditions to make trading by small operators viable on the market.	Renewable Energy Producer	Existing	2013-2020
7. Setting up an Issuing Office for Guarantees of Origin (Entidade Emissora das Garantias de Origem - EEGO)	Regulatory	Helping ensure the economic viability of projects generating electricity using RES and increasing transparency through the trading of guarantees of origin arising from the production of this type of electricity.	Renewable Energy Producer	Existing	2013-2020
8. Creation of a decentralised network of biomass plants	Regulatory	Creation of a decentralised network of new biomass plants following the invitation to tender for the attribution of capacity which was launched in 2006.	Renewable Energy Producer	Existing	2006-2019
9. Development of the PNBEPH for the new hydro operations in progress, and strengthening planned capacity and the installation of pumping systems.	Voluntary Financial	Strengthening hydro-capacity and increasing the installed reversible capacity, whilst promoting improved management of the electricity generating system and system security.	Renewable Energy Producer	Existing	2007-2020

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
10. Investment in hydro-electric power using pumps; this investment is important so as to ensure proper meshing with wind resources	Financial	Strengthening hydro-capacity and increasing the installed reversible capacity, whilst promoting improved management of the electricity generating system and system security.	Renewable Energy Producer	Existing	2008-2020
11. Ensuring the viability of energy through over-equipment of wind farms	Regulatory	Increase installed capacity from RES by 400 MW in an economically efficient manner and by improving the management of the electricity generating system and security of the supply.	Renewable Energy Producer	Existing	2010-2020
12. Electric mobility - Rationalisation of the charging infrastructure to meet current needs, in particular in areas with high demand, preferably with covered areas and monitoring.	Regulatory Financial	Increase in the use of electric vehicles	End user Municipalities	Existing	2010-2020
13. Promote the use of endogenous resources and waste for the production of biofuels and solutions related to second-generation raw material (non-food cellulosic material, and ligno-cellulosic material).	Voluntary	Significant increase in the use of endogenous resources in biofuel production. The measure has been implemented but without results. There is interest in residual material but no interest on the part of producers in endogenous raw materials.	Farmers Forestry producers Municipalities Other operators in the biofuels industry	Existing	2010-2020
14. Transposition and application in Portugal of directives and best practice in the area of biofuels and in particular the setting of sustainability criteria and high quality standards.	Regulatory	Ensure sustainable production of biofuels	Operators in the biofuels sector	Existing	2010-2020

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
15. Community Support Framework 2014-2020: identify financing needs and suitable instruments to support RES and energy efficiency projects.	Financial	Increase in the use of renewable energies	Renewable Energy Producer Public and private sector companies	Existing	2014-2020
16. Drawing up the Hydrogen Roadmap.	Study	Identify the capacity for hydrogen and define the roadmap for its respective development and use.	and SCT	Existing	2011-2020

* Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).
** Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?
*** Who are the target public: investors, end users, public administration, planners, architects, installers, etc.? What is the target activity/sector: production of biofuels; use of animal manure for energy purposes, etc.)?
**** Does this measure replace or complement measures contained in Table 5 of the NREAP?

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

Following on from the NREAP for 2020 and as required by Regulation (EU) No 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, Portugal submitted a preliminary version of its Energy and Climate Action Plan for 2021-2030 (NECP 2030) to the Commission in December 2018. As expected, the final version of the NECP 2030 was sent to the Commission at the end of 2019.

At the 2016 Conference of the Parties to the United Nations Framework Convention on Climate Change, Portugal committed to achieving carbon neutrality by 2050, developing and approving the Carbon Neutrality Roadmap for 2050 (CNR2050) which set out the vision, trajectories and guidelines for policies and measures to be achieved in that time frame. The Carbon Neutrality Roadmap for 2050 was the basis for the Strategy for Long-term Development with Low Greenhouse Gas Emissions submitted to the Conference of Parties on 20 September 2019.

The CNR2050 was drawn up in parallel to the preparatory work for the NECP 2030, which will be the main energy and climate policy instrument for the decade 2021-2030, setting new national targets for the reduction of greenhouse gases, renewable energies and energy efficiency, in line with the carbon neutrality target.

The NECP 2030 establishes a 10-year integrated energy and climate plan for the period 2021-2030 and defines the targets which Portugal aims to achieve in order to meet the EU energy and climate targets by 2030. The targets for renewable energies are shown in the following table:

Table 2 a: **Targets and trends for renewable energies**

	2010	2018	2020	2025	2030
RES Electricity	41%	52%	60%	69%	80%
RES Heating and Cooling	34%	41%	34%	36%	38%
RES Transport	6%	9%	10%	13%	20%
Overall RES share	**24%**	**30%**	**31%**	**38%**	**47%**

Source: NECP 2030, AECM (Directorate General for Energy and Geology (DGEG)/ Portuguese Environment Agency (APA)

The trajectory towards a carbon-neutral economy requires that the endogenous renewable potential in Portugal (which has only partially been harnessed) be used and maximised, that more demanding consumption patterns be adopted and that new and emerging clean technologies be promoted.

The policies and measures aimed at achieving the Portuguese contribution towards the EU's binding target for 2030 as regards energy from renewable sources are as follows:

- Accelerate the production of electricity from renewable energy sources:
  - Promote the development of new renewable capacity, specifically by setting up an auction system to allocate capacity to feed power into the electricity grid;
  - Foster the spread of hybrid systems based on renewable technologies and draft rules to enable their use;
  - Foster an increase in wind power production, specifically via over-equipment and repowering;
  - Promote renewable co-generation and gradually reduce incentives for co-generation from fossil fuels;
  - Promote ocean renewable energies;
  - Boost electricity generation from geothermal sources;
  - Promote pilot projects featuring renewable energies that are at the demo stage and not very well-known;
  - Set up system to provide guarantees of origin.

- Promote the spread of decentralised generation, energy self-consumption and energy communities:
  - Foster decentralised generation and self-consumption of energy from renewable sources, removing obstacles that prevent them from developing further;
  - Promote the creation and development of energy communities;
  - Promote support programmes for establishing energy communities in partnership with municipalities;
  - Reinforce the Electronic System of Registration of Generation Units (SERUP);
  - Set up an electronic portal with information on decentralised generation, self-consumption and energy communities.

- Promote the efficient use of renewable energies in heating and cooling systems:
  - Promote the acquisition and renovation of heating and cooling systems based on renewable energy sources.

- Optimise and simplify the licensing process associated to renewable electricity generation facilities:
  - Review and optimise the existing legal framework on the organisation and functioning of the national electricity system;
  - Get the one-stop-shop for licensing up and running.

- Promote adequate planning of transmission and distribution networks to boost the integration of new renewable capacity:
  - Adapt planning criteria for transmission and distribution networks;
  - Adjust the definition of capacity to receive new generation.

- Promote the production and consumption of renewable gases:
  - Establish rules for the injection of renewable gases;
  - Study and define targets for the incorporation of renewable gases;
  - Define and set up a quality certification system for renewable gases;
  - Set up a system to provide guarantees of origin for renewable gases;
  - Promote the production and consumption of green hydrogen.

- Foster better use of biomass for energy purposes:
  - Promote the generation of biomass-based energy on a local scale;
  - Promote and support the creation of a network of centres for collecting, storing and providing biomass at municipal or intermunicipal level;
  - Promote information and awareness campaigns.

- Promote the generation and use of renewable energy sources in the agriculture and forestry sectors:
  - Promote the installation and repurposing equipment for the generation and use of thermal and electrical energy from renewable sources in agriculture and forestry;
  - Increase the use of alternative fuels and other national resources that can be used as energy sources;
  - Promote the installation of equipment to generate thermal/ electrical equipment using biomass, biogas or biomethane.

- Encourage the energy transition in the transport sector:
  - Promote the use of renewable energy sources in transport fleets;
  - Look into repurposing diesel trains so they can be powered by green hydrogen and run on non-electrified tracks.

- Promote the production and consumption of alternative renewable fuels:
  - Promote the production of advanced biofuels, giving priority to endogenous national resources;
  - Make progress on phasing out conventional biofuels;
  - Promote mixes that have higher shares of bioenergy.

- Promote infrastructure for the supply of alternative fuels as clean fuels:
  - Promote the installation of supply points for liquid and gas fuels that are 100% renewable in public transport and municipal service fleets;
  - Promote and support the installation of supply points for green hydrogen;
  - Promote the development of infrastructure for the supply of renewable energy sources to vessels in ports;
  - Review the National Framework for Action to create infrastructure for alternative fuels.

- Promote R&D projects that support the transition towards a carbon-neutral economy:
  - Promote coordination with the Thematic Research and Innovation Agendas run by the Fundação para a Ciência e Tecnologia (Foundation for Science and Technology);
  - Innovation and development of low-carbon technologies, practices, products and services in all sectors of activity;
  - Support the participation of Portuguese companies in the Innovation Fund (NER 450);
  - Support the participation of Portuguese companies in the Horizon Europe and LIFE programmes, among others.

For more detailed information, see the NECP 2030 which is available on the websites of the Directorate-General of Energy and Geology (DGEG)[22] and of the European Commission[23].

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

As regards the transmission of electricity, the Development and Investment Plan for the Portuguese Electricity Transmission Network for the period 2018-2027 analysed various investments to allow for an increased share of renewable energies.

As regards the distribution of electricity, the Development and Investment Plan for the National Electricity Distribution Network for the period 2019-2023 is at the assessment stage. The Energy Services Regulatory Authority (ERSE) published a Regulation on smart grid services

[22] www.dgeg.gov.pt
[23] https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/national-energy-climate-plans

(Regulation No 610/2019[24]) establishing the framework that applies to provision of services in smart electricity distribution grids, particularly as regards network operators and suppliers.

The current Regulation on Access to Networks and Interconnections[25] was approved by the ERSE in Regulation No 560/2014 of 22 December 2014 and amended by Regulation No 620/2017 of 18 December 2017. In accordance with the Regulation, access to networks and interconnections must be transparent and non-discriminatory. The entitlement to access networks and interconnections is automatically recognised for all entities when they finalise the process of connecting their facilities to the network. This includes consumers and producers (ordinary and special schemes, as provided for in the legislation).

Access to networks and interconnections is formalised by signing the Contract for Use of Networks. This contract is signed by the market agent that represents the consumer/ generator, generally the supplier or the consumer/ generator themselves, if they participate in the market directly.

The significant reduction in the levelised costs of generating renewable energies, especially in photovoltaic generation, is now driving a huge number of new connection applications, which creates challenges in terms of network management and planning, as well as in terms of network costs.

In response to this, the government set up a new tender mechanism to allocate connection entitlements for the generation of renewable energies (included in Decree-Law No 76/2019). This mechanism offers network capacity for the connection of new photovoltaic generation at predefined delivery points. The auction mechanism also offers two alternative and concurrent connection models: A) connection entitlement with a commitment to variable payments to the network operator (for 15 years) and B) connection entitlement with a feed-in tariff (15 years). Auctions are held for variable payments (A) or discounts on the expected wholesale market price (B). In both cases, the new connections lead to supplements for the electricity system.

As for the rules of connection, the commercial conditions for connection to the network are defined by the ERSE in the Regulation on Commercial Relations for the electricity sector. The rules and costs for connecting facilities to the networks take criteria of economic rationality (supporting the costs of construction of the connection) and the need to guarantee consumer access to the electricity supply on a transparent and non-discriminatory basis. The rules are approved by the ERSE following public consultation processes in which all stakeholders are invited to participate.

Network operators are obliged to send the ERSE information twice a year on the number of connections made, the contributions made by candidates with a breakdown of the type of item, the total duration of items built, average periods for the initial cost assessment and average periods for implementation.

[24] https://dre.pt/application/conteudo/123675698
[25] https://www.erse.pt/ebooks/regulamento-de-acesso-as-redes-e-as-interligacoes/?p=2

3. Please describe 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 *(Art. 22(1)b) of Directive 2009/28/EC).*

Table 3a:
Support schemes for renewable energy in 2017

RES support schemes (2017)			Per unit support	Total (M€)*
Biofuels				
Financial	Obligation/quota (%)		7.5% energy content	not available
	Penalty (€/unit)		€2,000/ BV missing	not available
	Tax exemption/refund		€466.36/ 1,000 litres	0.2[26]
RES electricity			***(€/MWh)***	
Financial	Production incentives			
		Feed-in tariffs:		
		- Renewable co-generation P ≤ 2 MW[27]	83.69	not available
		- Renewable co-generation 2 MW < P ≤ 100 MW[28]	67.91	not available
		Feed-in tariff - additional cost above market rates:		
		- Micro-generation	126.9	39,137
		- Photovoltaic	312.5	155,136
		- Biomass	101.6	76,468
		- Biogas	96.4	27,824
		- Renewable co-generation	48.3	80,970
		- Wind	71.8	894,815
		- Mini-hydro	80.5	84,978
		- Municipal solid waste	65.7	31,048
Total annual estimated support in the electricity sector			65.8	1,417,706
Total annual estimated support in the heating sector			not available	not available
Total annual estimated support in the transport sector			€466.36/ 1,000 litres	0.2

*The quantity of energy promoted by the per unit support gives an indication of the effectiveness of the support for each type of technology

(*Source*: DGEG, ERSE)

[26] Provisional value.
[27] Average of quarterly reference tariffs for 2017- an efficiency premium and a renewable energy premium are added to this incentive.
[28] Average of quarterly reference tariffs for 2017- an efficiency premium and a renewable energy premium are added to this incentive.

Table 3b:
Support schemes for renewable energy in 2018

RES support schemes (2018)			Per unit support	Total (M€)*
Biofuels				
Financial	Obligation/quota (%)		7.5% energy content	not available
	Penalty (€/unit)		€2,000/ BV missing	not available
	Tax exemption/refund		€471.10/ 1,000 litres	0.3[29]
RES electricity			***(€/MWh)***	
Financial	Production incentives			
		Feed-in tariff:		
		- Renewable co-generation P ≤ 2 MW[30]	84.83	not available
		- Renewable co-generation 2 MW < P ≤ 100 MW[31]	68.85	not available
		Feed-in tariff - additional cost above market rates:		
		- Micro-generation	36.9	11,325
		- Photovoltaic	249.0	132,473
		- Biomass	53.7	38,139
		- Biogas	51.9	14,409
		- Renewable co-generation	68.2	126,129
		- Wind	35.1	438,656
		- Mini-hydro	39.1	41,793
		- Municipal solid waste	37.4	17,944
Total annual estimated support in the electricity sector			43.6	943,381
Total annual estimated support in the heating sector			not available	not available
Total annual estimated support in the transport sector			€471.10/ 1,000 litres	0.3

*The quantity of energy promoted by the per unit support gives an indication of the effectiveness of the support for each type of technology

(*Source*: DGEG, ERSE)

3.1. Please provide the 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).*

Decree-Law No 29/2006 of 15 February 2006, as amended by Decree-Laws No 104/2010 of 29 September 2020, No 78/2011 of 20 June 2011, No 75/2012 of 26 March 2012, No 112/2012 of 23 May 2012, No 215-A/2012 of 8 October 2012, No 178/2015 of 27 August 2015 and by Law No 42/2016 of 28 December 2016, established the general rules on the organisation and

[29] Provisional value.
[30] Average of quarterly reference tariffs for 2018- an efficiency premium and a renewable energy premium are added to this incentive.
[31] Average of quarterly reference tariffs for 2018- an efficiency premium and a renewable energy premium are added to this incentive.

functioning of the Portuguese electricity system (SEN), as well as the general rules which apply to the activities of the generation, transmission, distribution and marketing of electricity and to the organisation of the electricity markets; transposing into Portuguese law the principles of Directive No 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity. Article 45 of this Decree-Law, on 'Labelling of electricity' established that electricity suppliers must specify the following information in the invoices or accompanying documentation and in the promotional materials they provide to end customers: The contribution of each energy source towards the total electricity acquired by the electricity supplier in the previous year; the reference sources on which information provided to the public on environmental impact is based, specifically in terms of carbon dioxide emissions resulting from the generation of electricity from the various energy sources placed on the market in the previous year.

Law No 51/2008 of 27 August 2007 established the obligation for all electricity suppliers to include in their invoices information on the origin of the electricity they purchased and sold to their customers (mix), as well as on the environmental impact associated to supplying that electricity.

In 2011, the ERSE drafted a document with the principles and best practices to guarantee quality labelling - Recommendation No 2/2011, which established the obligation for all electricity suppliers to include in their invoices information on the origin of the electricity they purchase and sell to their customers (mix), as well as on the environmental impact associated to supplying that electricity.

The amendment to Decree-Law No 29/2006 by Decree-Law No 215-A/2012 of 8 October 2012 transposed Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 and established more rules in terms of the relations between suppliers and customers, specifically the information to be contained in contracts and the reporting and publication obligations for suppliers under Articles 45-A and 45-B.

ERSE Regulation No 561/2014, i.e. the Regulation on Commercial Relations in the Electricity Sector[32] established provisions on commercial relations between the various parties intervening in the Portuguese Electricity System (SEN).

Article 133 of this Regulation, 'Labelling of electricity', provides that suppliers and last resort suppliers must specify the following information in the invoices for the electricity or in the accompanying documentation, clearly and in a manner that is comprehensible to their customers: a) The contribution of each energy source towards the total electricity supplied to its customers in the previous calendar year; b) The total carbon dioxide emissions associated to the generation of the electricity being invoiced; c) The method and the reference sources used in calculating the information mentioned above, which should at least include the inclusion of their website where this information can be found.

[32] https://dre.pt/application/conteudo/65963452

On 21 December 2017, the ERSE issued Regulation No 632/2017[33], the first amendment to the Regulation on Commercial Relations for the electricity sector.

The amendment to the Regulation on Commercial Relations for the electricity sector was needed to establish and clarify at regulatory level specific aspects arising from legislative developments, specifically to register the general conditions for contracts to supply electricity and the standardised terms of the respective specific conditions, as well as a change in the general rules on the labelling of electricity so as to simplify certain procedures and information, along with criteria that are better suited to the development of the retail market.

ERSE Directive No 16/2018, of 13 December 2018[34] repealed Recommendation No 2/2011 and amended the rules for the labelling of electricity, which came into force on 1 January 2019. For information on the Labelling of Electricity, see the ERSE website[35].

[33] https://dre.pt/application/conteudo/114390878
[34] https://dre.pt/application/conteudo/117376527
[35] https://simulador.rotulagem.erse.pt/

4. Please provide 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 waste, residues, non-food cellulosic material, and ligno-cellulosic material?) ***(Art. 22(1)c) of Directive 2009/28/EC)***

In this regard, we should point out that for biofuels produced from certain waste, residues, non-food cellulosic material and ligno-cellulosic material, the double counting provision still applies when BVs are issued. Decree-Law No 152-C/2017 of 11 December 2017, which transposed into Portuguese law Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015, introduced amendments to Decree-Law No 117/2010 of 25 October 2010, adding Annex IV to this legal document and allocating the issue of subsidised BVs to biofuels produced from the raw materials listed in Annex IV.

On the other hand, full exemption from the ISP tax (tax on oil and energy products) for small specialised biofuels producers has been maintained up to a maximum overall limit of 40,000 tonnes/year in respect of the biofuel that they introduced for consumption.

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

The responsibilities attributed to the Issuing Office for Guarantees of Origin (EEGO) were assigned to the concessionaire of the national transmission grid (RNT), which accumulated the issuing of guarantees of origin for the production of electricity through cogeneration.

Following the publication of Decree-Law No 68-A/2015 of 30 April 2015, the competencies of the Issuing Authority for Guarantees of Origin (EEGO) were transferred to the Directorate-General for Energy and Geology.

In 2018, the State Budget Law for 2019 (Law No 71/2018 of 31 December 2018) changed these competences by defining that the concessionaire of the Portuguese Electricity Transmission Network would be allocated the competences of the Issuing Office for Guarantees of Origin (EEGO) as regards the generation of electricity and energy for heating and cooling from renewable energy sources. It also stated that in performing its functions, the Issuing Office for Guarantees of Origin (EEGO) should use criteria that were objective, transparent and non-discriminatory. The Issuing Office for Guarantees of Origin (EEGO) is subject to the surveillance of the National Entity for the Energy Sector (ENSE), which publishes its annual report summarising the action taken on its website.

The procedures manual which explains how the Issuing Office for Guarantees of Origin (EEGO) carries out its functions is drafted by the latter and approved by the Directorate-General of Energy and Geology, following the issue of an opinion by the National Entity for the Energy Sector (ENSE), with a view to ensuring the necessary mechanisms for surveillance of the EEGO.

6. Please describe the developments in 2017 and 2018 as regards 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

	Amount of domestic raw material (*)		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non-EU countries (ktoe)		Primary energy in amount of imported raw material from non-EU countries (ktoe)	
	2017	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land for energy generation (fellings, etc.)**	4,218	4,285	1,093	1,144	-	-	-	-	-	-	-	-
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	4,703	4,773	1,274	1,256	37	38	24	24	-	-	-	-
Agricultural by-products / processed residues and fishery by-products**	-	-	-	-	-	-	-	-	-	-	-	-
Biomass from waste (municipal, industrial, etc.)**	-	-	-	-	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short rotation trees (please specify)	1,211	1,128	209	194	-	-	-	-	-	-	-	-
Other: Biogas	152,284,850	144,721,014	77	75	-	-	-	-	-	-	-	-
Biomass supply for transport:												
Common arable crops for biofuels (please specify main types)	-	-	-	-	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)	-	-	-	-	-	-	-	-	-	-	-	-

	Amount of domestic raw material (*)		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non-EU countries (ktoe)		Primary energy in amount of imported raw material from non-EU countries (ktoe)	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
Other (please specify)	-	-	-	-	-	-	-	-	-	-	-	-

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

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

Notes: The unit used is kton, with the exception of biogas, for which it is m^3. Urban waste includes the renewable fraction (54.9%) and the non-renewable fraction.

Table 4a:

Current domestic agricultural land use for production of crops dedicated to energy production (ha)

Land use	Surface *(ha)*	
	2017	2018
1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed, sunflower etc.) (Please specify main types)		
Land used for common arable crops (cereals)	323,071.3	292,557.2
Wheat	29,018.9	27,024.7
Sugar beet	106.0	0.0
Land used for oil crops	13,565.6	9,492.2
Sunflower	13,459.6	9,492.2
2. Land used for short rotation trees (willows, poplars). (Please specify main types)	not available	not available
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum. (Please specify main types)	not available	not available

(*Source:* DGEG, GPP-Ministry of Agriculture)

The information reported in Table 4a refers to the total area devoted to the specified crop types, including the area allocated to energy production.

In 2018, 3,873 tonnes of rapeseed oil from Portuguese agricultural materials were used to produce biofuels.

7. Please provide information on any changes in commodity prices and land use within your Member State in 2017 and 2018 associated with increased use of biomass and other forms of energy from renewable sources? Please provide where available references to relevant documentation on these impacts in your country *(Article 22(1)(h) of Directive 2009/28/EC).*

There were no noteworthy changes in commodity prices or land use in 2017 and 2018 associated with increased use of biomass and other forms of energy from renewable sources.

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

Table 5:
Development Biofuels
Please provide the total amounts of biofuels made from the feedstocks listed in Annex IX of Directive 2009/28/EC (ktoe)

Feedstock as listed in Annex IX Part A of Directive 2009/28/EC	**2017**	**2018**
(a) Algae if cultivated on land in ponds or photobioreactors	0.00	0.00
(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	0.00	0.00
(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	0.00	0.00
(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	0.00	0.00
(e) Straw	0.00	0.00
(f) Animal manure and sewage sludge	0.00	0.00
(g) Palm oil mill effluent and empty palm fruit bunches	0.00	0.00
(h) Tall oil pitch	0.00	0.00
(i) Crude glycerine	0.00	0.00
(j) Bagasse	0.00	0.00
(k) Grape marcs and wine lees	0.00	0.00
(l) Nut shells	0.00	0.00
(m) Shells	0.00	0.00
(n) Cobs cleaned of kernels of corn	0.00	0.00
(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	0.00	0.00
(p) Other non-food cellulosic material as defined in point (s) of the second paragraph of Article 2	0.00	0.00
(q) Other ligno-cellulosic material as defined in point (r) of the second paragraph of Article 2 except saw logs and veneer logs	0.00	0.00
Feedstock as listed in Annex IX Part B of Directive 2009/28/EC	**2017**	**2018**
(a) Used cooking oil;	135.67	162.34
(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	3.81	3.29

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within your country in 2017 and 2018. Please provide links to relevant documents describing this impact in your country where these are available ***(Article 22(1)(j) of Directive 2009/28/EC).***

Given the low levels of endogenous agricultural material used in the production of biofuels, it does not appear that at national level, there is any impact on biodiversity, water resources or soil quality.

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

Table 6:
Estimated GHG emission savings from the use of renewable energy (t eq CO_2)

Environmental aspects	2017	2018
Total estimated net GHG emission saving from using renewable energies[36]	**15,966,954**	**16,150,057**
— Estimated net GHG saving from the use of renewable electricity[37]	5,966,643	5,821,723
— Estimated net GHG saving from the use of renewable energy in heating and cooling[38]	9,180,962	9,384,578
— Estimated net GHG saving from the use of renewable energy in transport[39]	819,349	943,756

[36] The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.
[37] *The GN conversion factor was used rather than that recommended by the Commission (56.1 g CO_2eq/MJ)
[38] **The conversion factor recommended by the Commission was used (87 g CO_2eq/MJ)
[39] The diesel conversion factor was used (74.1 g CO2eq/MJ).

11. Please report on (for the preceding 2 years) and estimate (for the following years up to 2020) 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 [Member State] (ktoe)[40],[41]

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual and estimated excess and/or deficit production (differentiated by type of renewable energy and by origin/destination of import/export)	-	-	-	-	-	-	-	-	-	-	-	-

11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules

Considering how the renewable energies fraction is evolving, we do not expect it to be necessary to receive statistical transfers in order to meet the RES target for 2020. However, it is not yet clear if there will be an excess of RES that would allow to start a statistical transfers procedure.

There have not been any studies or assessments on the relative costs of any hypothetical statistical transfers.

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

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

12. Please provide 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)*.

Regarding the share of municipal solid waste, the data presented takes account of EU recommendations, in that 50% of the raw material used should be considered to be renewable. The data used is supplied, on an annual basis, directly from electricity producers.

13. Please provide 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 that Member State 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	2.95	5.60
Sugars	0.00	0.00
Oil seed crops	98.56	104.38