

**FOURTH PROGRESS REPORT
(2015-2016)**

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

**National Renewable Energy Action Plan
(NREAP)**

Portugal

BACKGROUND

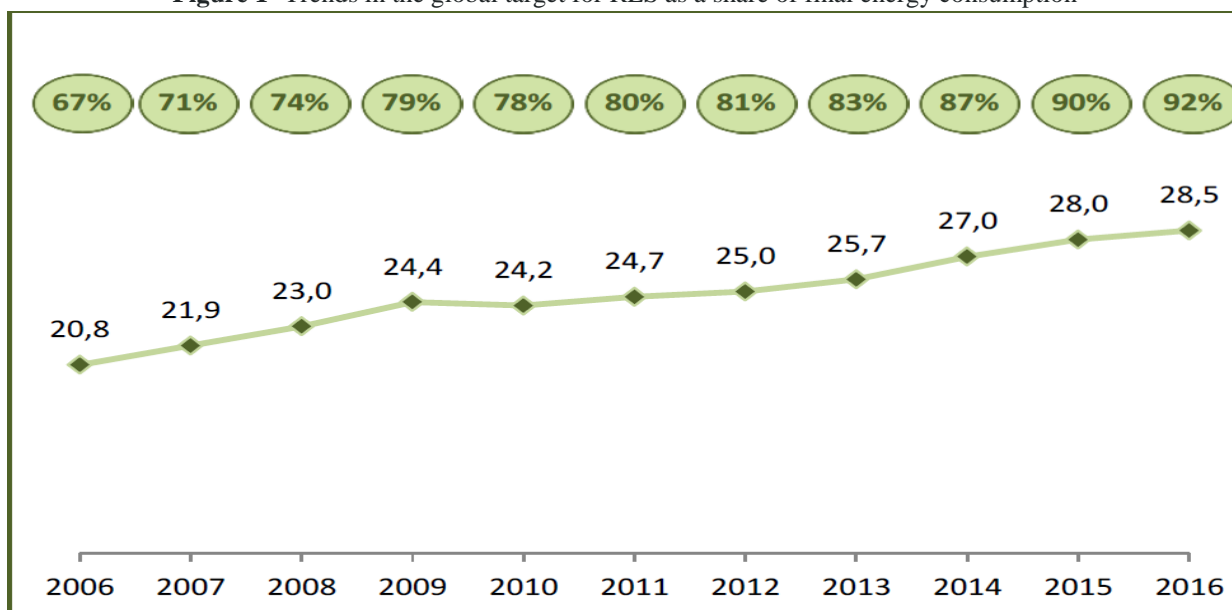
In accordance with Article 22 of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Portugal presents its fourth report on progress made in terms of the promotion and use of energy from renewable sources during the years 2015 and 2016, based on the measures contained in the National Renewable Energy Strategy adopted in 2013, which established the National Renewable Energy Action Plan (NREAP 2020).

The NREAP consists of Council of Ministers Resolution No 20/2013 dated 10 April 2013, leading to a simultaneous and integrated amendment of the National Renewable Energy Action Plan (NREAP 2020) for the period 2013-2020 and also the National Action Plan for Energy Efficiency (NEEAP 2016) for the period 2013-16. These two plans were merged with a view to achieving a better match between the demand and supply of energy and ensuring more effective compliance with national and EU objectives, minimising the investment required and increasing national competitiveness. Various sectors of the public administration were involved in drawing up the Plans and the document entitled ‘Strategic guidelines for the review of the National Renewable Energy Action Plan and National Action Plan for Energy Efficiency’ was subject to public consultation.

In the period to which this report refers (2015-2016), Portugal remained 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 accounting for 31 % of the gross final energy consumption 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 regards achieving the target of RES accounting for 31 % by 2020: Portugal reached 28 % in 2015, rising to 28.5 % in 2016. This means that the final target was 90% achieved in 2015 and 92% achieved in 2016, as may be seen in Figure 1.

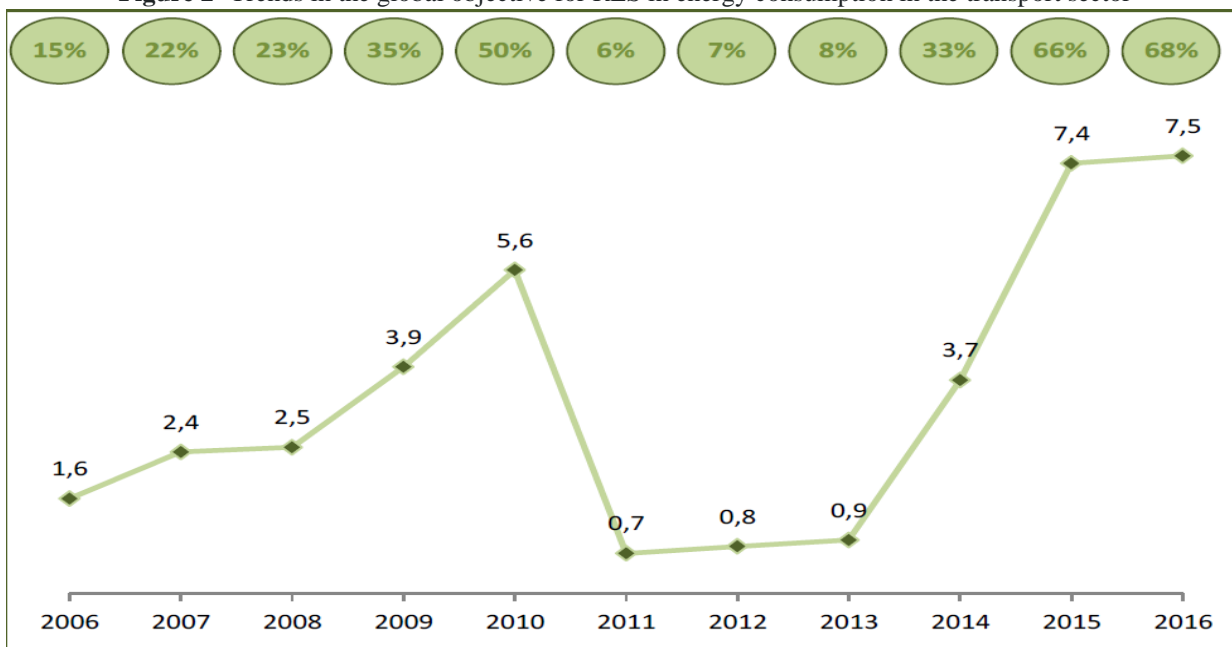
Figure 1- Trends in the global target for RES as a share of final energy consumption



(Source: DGEG)

In the transport sector, in 2015 Portugal achieved 7.4 % in terms of the actual percentage of RES. There was a slight increase to 7.5 % in 2016, which is the equivalent of 68 % of the final objective, as may be seen in Figure 2.

Figure 2- Trends in the global objective for RES in energy consumption in the transport sector



(Source: DGEG)

The main contribution in this sector is still the inclusion of biofuels. However, in the last two years, Portugal has promoted their contribution to sustainable mobility and to enhancing energy efficiency in transport. In this field, Portugal has implemented a number of measures designed

to boost electric mobility in order to guarantee its sustainability and provide incentives to increase the number of electric vehicles on the national market.

In 2015, an Action Plan for Electric Mobility was adopted, featuring four main objectives at national level:

- To boost the efficacy and efficiency of the Portuguese transport system, with a view to attaining the targets set for reducing CO₂ emissions and their negative impact on climate change;
- To reduce Portugal's dependence on external energy sources as regards the importation of fossil fuels;
- To modernise and raise the international profile of Portuguese industry and make it more competitive; and
- To boost civil society engagement by promoting smart mobility and enhancing the well-being and quality of life of the general public.

Figure 3 shows the global trends in the three sectors - renewable electricity, heating and cooling and transport, until 2016.

Figure 3: Trends in the share of renewable energy in the consumption of energy in the three sectors

[Graph]

(Source: DGEG)

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (n-1; n-2 e.g. 2010 and 2009) (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 sources¹

| | 2015 | 2016 |
|--|----------------|----------------|
| RES-H&C ² (%) | 33.36 % | 35.12 % |
| RES-E ³ (%) | 52.63 % | 54.07 % |
| RES-T ⁴ (%) | 7.38 % | 7.51 % |
| Overall RES share ⁵ (%) | 27.98 % | 28.50 % |
| <i>Of which from cooperation mechanism⁶ (%)</i> | 0.00 % | 0.00 % |
| <i>Surplus for cooperation mechanism⁷ (%)</i> | 0.00 % | 0.00 % |

Table 1 a: Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)⁸

| | 2015 | 2016 |
|---|-------------|-------------|
| A) Gross final consumption of RES for heating and cooling | 1 839.1 | 1 892.3 |
| B) Gross final consumption of electricity from RES | 2 410.0 | 2 493.9 |
| C) Gross final consumption of energy from RES in transport | 340.7 | 277.0 |
| D) Gross total RES consumption ⁹ | 4 589.8 | 4 663.2 |
| 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) | 4 589.8 | 4 663.2 |

¹ Facilitates comparison with Table 3 and Table 4a of the NREAP.

² 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 the NREAP applies.

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

⁴ Share of renewable energy in transport: final energy from renewable sources consumed in the transport sector (cf. Article 5(1)c) and 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 the NREAP applies.

⁵ Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of the NREAP applies.

⁶ In percentage points of overall RES share.

⁷ In percentage points of overall RES share.

⁸ Facilitates comparison with Table 4a of the NREAP

⁹ In accordance with Art.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 sector¹⁰

| | 2015 | | 2016 | |
|---------------------------------------|-----------------|-----------------|-----------------|-----------------|
| | MW | GWh | MW | GWh |
| Hydro ¹¹ : | 6 168.0 | 12 074.4 | 6 960.0 | 12 627.3 |
| <i>conventional (without pumping)</i> | 4 379.0 | 9 703.8 | 4 389.0 | 9 115.4 |
| <i><1MW</i> | 31.0 | 81.7 | 31.0 | 82.6 |
| <i>1MW—10 MW</i> | 363.0 | 1 001.9 | 373.0 | 1 014.1 |
| <i>>10MW</i> | 3 985.0 | 10 353.4 | 3 985.0 | 10 360.7 |
| <i>only pumping</i> | 0.0 | | 0.0 | |
| <i>mixed</i> ¹² : | 1 789.0 | 1 733.3 | 2 571.0 | 2 342.6 |
| <i>Geothermal</i> | 25.0 | 203.6 | 25.0 | 171.6 |
| <i>Solar:</i> | 447.0 | 796.2 | 462.0 | 822.3 |
| <i>photovoltaic</i> | 447.0 | 796.2 | 462.0 | 822.3 |
| <i>concentrated solar power</i> | 0.0 | 0.0 | 0.0 | 0.0 |
| <i>Tide, wave, ocean</i> | 0.0 | 0.0 | 0.0 | 0.0 |
| <i>Wind:</i> | 4 937.0 | 12 002.0 | 5 124.0 | 12 512.6 |
| <i>onshore</i> | | | | |
| <i>offshore</i> | | | | |
| Biomass ¹³ : | 537.0 | 2 812.0 | 545.0 | 2 765.6 |
| <i>solid biomass</i> | 471.0 | 2 518.0 | 477.0 | 2 481.1 |
| <i>biogas</i> | 66.0 | 293.9 | 68.0 | 284.6 |
| <i>bioliquids</i> | 0.0 | 0.0 | 0.0 | 0.0 |
| GRAND TOTAL | 12 114.0 | 27 888.1 | 13 116.0 | 28 899.5 |
| <i>of which in CHP</i> | 6 168.0 | 1 737.7 | 6 960.0 | 1 738.1 |

¹⁰ Facilitates comparison with Table 10 a of the NREAP

¹¹ Standardised production in accordance with Directive 2009/28/EC and Eurostat methodology.

¹² Standardised in accordance with Eurostat methodology.

¹³ Only considers those meeting the applicable sustainability criteria (see the final paragraph of Art. 5(1) of Directive 2009/28/EC).

Table 1c: Total actual contribution (final energy consumption¹⁴) 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 heating and cooling (ktoe)¹⁵

| | 2015 | 2016 |
|--|----------------|----------------|
| Geothermal (excluding low temperature geothermal heat in heat pump applications) | 1.5 | 1.4 |
| Solar | 80.3 | 84.0 |
| Biomass ¹⁶ : | 1 757.4 | 1 807.0 |
| <i>solid biomass</i> | 1 749.3 | 1 798.2 |
| <i>biogas</i> | 8.5 | 8.8 |
| <i>bioliquids</i> | 0.0 | 0.0 |
| Renewable energy from heat pumps: <i>aerothermal, geothermal, hydrothermal</i> | 0.0 | 0.0 |
| GRAND TOTAL | 1 839.2 | 1 892.2 |
| Of which DH ¹⁷ | | |
| Of which biomass in households ^{18 19 20} | 763.5 | 764.3 |

⁽¹⁾ n.a. – not available

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)^{19, 20}

| | 2015 | 2016 |
|--|---------------|---------------|
| Bioethanol/bio-EBTE | 22.23 | 21.55 |
| <i>Of which biofuels,²¹ Article 21(2)</i> | 0.00 | 0.00 |
| <i>Of which imported²²</i> | 18.86 | 23.01 |
| Biodiesels | 302.24 | 235.96 |
| <i>Of which biofuels,²³ Article 21(2)</i> | 35.75 | 107.16 |
| <i>Of which imported²⁴</i> | 48.74 | 1.09 |
| Hydrogen from renewables | 0.00 | 0.00 |
| RES electricity | 12.91 | 17.13 |
| <i>Of which road transport</i> | 0.04 | 0.04 |
| <i>Of which non-road transport</i> | 12.87 | 17.09 |
| Others (such as biogas, vegetable oils, etc.) | 3.23 | 2.23 |
| <i>Of which biofuels,²⁵ Article 21(2)</i> | 3.23 | 2.23 |
| GRAND TOTAL | 340.61 | 276.87 |

¹⁴ Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.

¹⁵ Facilitates comparison with Table 11 of the NREAP.

¹⁶ Only considers those meeting the applicable sustainability criteria (see the final paragraph of Art. 5(1) of Directive 2009/28/EC).

¹⁷ District heating and/or cooling as share of total consumption of heating and cooling from renewable energy sources (RES-DH).

¹⁸ Of the total consumption for heating and cooling from renewable energies

¹⁹ For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last paragraph.

²⁰ Facilitates comparison with Table 12 of the NREAP.

²¹ Biofuels that are included in Article 21(2) of Directive 2009/28/EC

²² From the whole amount of bioethanol/bio-ETBE.

²³ Biofuels that are included in Article 21(2) of Directive 2009/28/EC

²⁴ From the whole amount of biodiesel.

²⁵ Biofuels that are included in Article 21(2) of Directive 2009/28/EC

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

Table 2: Overview of all policies and measures

Measures concluded in 2015 and 2016

| Name and reference of the measure | Type of measure | Expected result | Targeted group | Effective (E)/ | Date | |
|--|-----------------|---|---|----------------|-------|------|
| | | | | | Start | End |
| Assess the potential of bio-methane in Portugal and its alternative applications and regulate specifications for the injection of bio-methane in the Natural Gas (NG) network. | Study | Enable bio-methane to be used for purposes other than generating electricity. | Portuguese State and SCT | completed | 2012 | 2015 |
| Strengthening the Biomass Energy Centre. | Voluntary | Help to set up a centre for research, certification and general coordination in the biomass sector. Increase in sustainable biomass use. | CBE - Forestry sector | completed | 2011 | 2015 |
| 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 | completed | 2010 | 2015 |
| 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 Producers/ Companies Public-private sector | completed | 2014 | 2016 |
| Allocation of incentives to be applied to plants using forest biomass subject to certain conditions, through voluntary agreements with the plant promoters. | Financial | Create a framework for commitment with the promoters of biomass plants thus enabling projects to be carried out and committing promoters to supporting the implementation of forestry policy measures, organising the logistical chain, enhancing the local economy, being socially responsible and complying with deadlines for the construction and implementation of projects. | Renewable Energy Producer | completed | 2011 | 2016 |

Measures planned and in force for the Heating and Cooling (H&C) sector

| Name and reference of the measure | Type of measure | Expected result | Targeted group and/or activity | Effective (E)/Planned (P) | Date | |
|---|--------------------------|---|--|---------------------------|-------|------|
| | | | | | Start | End |
| 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 | Residential: 76 200 tep in 2020 Services: 31 776 tep in 2020 | End user (Residential, Services and the Portuguese State) | E | 2003 | 2020 |
| 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 Portuguese State | P | 2013 | 2020 |
| 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) | P | 2010 | 2020 |

Measures planned and in force for the Electrical sector

| Name and reference of the measure | Type of measure | Expected result | Targeted group and/or activity | Effective (E)/Planned (P) | Date | |
|--|-------------------------|---|--------------------------------|---------------------------|-------|------|
| | | | | | Start | End |
| 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 | E | 2013 | 2020 |
| 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 | E | 2013 | 2020 |
| 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 | E | 2007 | 2020 |

| Name and reference of the measure | Type of measure | Expected result | Targeted group and/or activity | Effective (E)/Planned (P) | Date | |
|--|-----------------|--|--------------------------------|---------------------------|-------|------|
| | | | | | Start | End |
| Investment in the hydro-electric power system 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 | E | 2008 | 2020 |
| Ensuring the viability of energy through over-equipment of wind farms | Regulatory | Increase installed capacity from RES by 400MW in an economically efficient manner and by improving the management of the electricity generating system and security of the supply. | Renewable Energy Producer | E | 2010 | 2020 |
| 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 | E | 2003 | 2020 |

Measures planned and in force for the Transport sector

| Name and reference of the measure | Type of measure | Expected result | Targeted group and/or activity | Effective (E)/Planned (P) | Date | |
|---|--------------------------|--|--|---------------------------|-------|------|
| | | | | | Start | End |
| 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 | E | 2010 | 2020 |
| 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 | E | 2010 | 2020 |

Policies and measures shared by the three sectors

| Name and reference of the measure | Type of measure | Expected result | Targeted group and/or activity | Effective (E)/Planned (P) | Date | |
|---|-----------------|--|--|---------------------------|-------|------|
| | | | | | Start | End |
| 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 | E | 2012 | 2018 |
| Drawing up the Hydrogen Roadmap. | Study | Identifying the capacity for hydrogen and defining the roadmap for its respective development and use. | State | E | 2011 | 2020 |
| 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 Producers/ Companies Public-private sector | E | 2014 | 2020 |

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/CE).

Decree-Law No 49/2015 of 10 April 2015 was published in the area of electricity generation, establishing a special scheme for the use of water resources and access to the activity of electricity generation with capacity above 1 MVA and linking it to the scheme for access to the activity of electricity generation subject to the prior notification or prior registration schemes in the case of generation intended for self-consumption.

As far as the transport sector is concerned and as part of the National Programme for Climate Change approved by Decision No 56/2015 of the Cabinet of Ministers on 30 July 2015, which established GHG emission reduction targets for 2020 and 2030, the use of alternative fuels in transport - in particular, electricity in road transport - is a strategic option of great interest for the goal of including energy from renewable sources in this sector.

In 2016, Decree-Law No 69/2016 of 3 November 2016 made a second amendment to Decree-Law No 117/2010 of 25 October 2010, as amended by Decree-Law No 6/2012 of 17 January 2012, which established sustainability criteria for the production and use of biofuels and bioliquids, irrespective of source, and mechanisms for promoting biofuels in

land transport, as well as limits on the mandatory inclusion of biofuels for the years 2011 to 2020.

This Decree-Law changed the annual checks on compliance with targets to quarterly checks, thus enabling faster control and a greater focus on preventing unfair competition. It also allows for the suspension of the operation certificate in the National Oil System (SPN) if it is detected that situations of non-compliance are not addressed.

2.b Please describe the measures taken 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(*Art. 22(1)f) of Directive 2009/28/EC*)

The measures and the main energy policy guidelines at national and European level and the commitments undertaken by Portugal in the area of renewable energies are all reflected in the Development and Investment Plans for the Electricity Transmission and Distribution networks, which are drafted by the respective operators. The need to strengthen and develop the networks, requests for network connection from electricity-generating plants or generation licenses granted to ensure the existence of reception capacity for new sources of energy are also taken into account in these Plans.

REN - Redes Energéticas Nacionais, in its capacity as operator of the national electricity transmission network, draws up 10-year plans, entitled the 'Development and Investment Plan for the Electricity Transmission Network' which are combined with the 5-year plans submitted by EDP Distribuição, the operator for the electricity distribution network, entitled the 'Development and Investment Plan for the Electricity Distribution Network'.

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*).

According to Portuguese law and following the amendments made by Decree-Law No 215-B/2012 of 8 October 2012 to Decree-Law No 172/2006 of 23 August 2006, the activity of [electricity] production may be exercised under two schemes:

- The general scheme, whereby generators sell electricity produced on organised markets or through the conclusion of bilateral contracts with end customers or with electricity suppliers, including with the market facilitator (not yet regulated) or any other supplier that adds to production; or
- The guaranteed remuneration scheme, where the electricity produced is

delivered to the supplier of last resort, in exchange for payment of the remuneration granted to the electricity-producing centre, which is subject to the granting of a production licence, an operating licence and the allocation of a reserve capacity for placing in the public-service electricity grid.

Decree-Law No 153/2014 dated 20 October 2014 came into force in January 2015. It establishes the remuneration system for electricity produced by Small Production Units and which is delivered to the network, based on a bidding model, in which competitors offer discounts to the reference rate, corresponding to the highest value resulting from the largest discount offers to the reference rate, laid down in a *Portaria* (Ministerial Implementing Order) issued by the member of the government responsible for the energy sector by 15 December of each year. The rate of remuneration varies depending on the type of primary energy used, being determined by the application of percentages to the reference rate, defined in a Ministerial Implementing Order (*Portaria*) issued by the member of the government responsible for energy.

As far as biomass and the targets for the use of forestry resources are concerned, Decree-Law No 166/2015 of 21 August 2015 was published, establishing measures to promote the production and recovery of forest biomass for the purpose of supplying forest biomass-operated power plants, extending the designated deadlines and partially or totally integrating or redistributing capacities allocated and not yet installed, in order to provide access to incentives to build and operate these power plants.

As regards renewable energies that are sourced or located in the ocean, where there has been significant evolution in the technologies, Ministerial Implementing Order (*Portaria*) No 202/2015 of 13 July 2015 established a remuneration scheme applicable to the production of renewable energy by electricity-generating plants using technologies at the experimental or pre-commercial stage, which opened up new opportunities for energy to be generated in this type of locations.

From 2016 onwards and according to the political guidelines defined by the interim government, the goal is to achieve a gradual and progressive transition from the feed-in tariff model to a system where renewable energy will be remunerated at market prices.

However, in accordance with Article 15 of Decree-Law No 215-B/2012 - Repealing provisions, the conditions remained unchanged for the tender procedures launched before 2015 (Feed-in tariff as indicated in Tables 3a and 3b).

As regards the transport sector, in 2015 and 2016 the exemption from the Portuguese ISP tax (*Imposto sobre Produtos Petrolíferos e Energéticos* - tax on oil and energy products) up to an overall maximum limit of 40 000 t/year was maintained in the case of biofuels for consumption. This is only available to small specialist producers, as long as they use at least 60 % of waste materials in the production of biofuels, in accordance with the Portuguese Code on Excise Duties.

Table 3a: Support schemes for renewable energy in 2015

| The RES support schemes for 2014 was maintained | | Per unit support | Total (M€) |
|--|--|-------------------------|------------|
| Biofuels | | | |
| | Obligation/quota (7.5 % energy content) | - | - |
| | Penalty (€/toe of biofuel missing) | 2000 €/toe | |
| | Tax exemption (small specialist producers) | 402.01 €/m ³ | 1.68 |
| RES electricity | | (€/MWh) | |
| Production incentives - feed-in tariff | | | |
| Micro-generation | 8 years | 66 | - |
| | 7 years | 145 | - |
| Mini-generation - 15 years | | 106 | - |
| Photovoltaic | CPV | 380 | - |
| | PV | 257 | - |
| Forest biomass | | 119 | - |
| Biogas | | - | - |
| Renewable cogeneration | P ≤ 2MW | 82.47(*) | - |
| | 2MW < P ≤ 100MW | 66.97(*) | - |
| Wind | | 74-75(**) | - |
| Hydro | Up to 10 MW inclusive | 95 | - |
| | > 10MW and ≤ 20MW | 91-94 | - |
| Municipal solid waste | | - | - |
| Production incentives – feed-in tariff (additional cost above market rates) | | | |
| Micro-generation | | 305.97 | 96.46 |
| Photovoltaic | | 205.09 | 91.90 |
| Biomass | | 56.32 | 40.22 |
| Biogas | | 45.62 | 12.16 |
| Renewable co-generation | | 52.58 | 99.22 |
| Wind | | 38.29 | 448.00 |
| Mini-hydro | | 42.16 | 47.20 |
| Municipal solid waste | | 22.06 | 10.17 |
| Total annual estimated support in the electricity sector | | 54.34 | 845.33 |
| Total annual estimated support in the heating sector | | n.a | - |
| Total annual estimated support in the transport sector | | - | 1.68 |

(Source: DGEG, ERSE)

(*) Average quarterly reference tariffs for 2013

(* *) During phase A of wind tenders – discounts applied to the 5 % tariff

During phase B of wind tenders - discounts applied to the 5 % tariff during initial phase and 9% after renegotiation of the contract

During phase C of wind tenders – discounts applied to the tariff between 5.15 % and 23.15 %

Table 3b: Support schemes for renewable energy in 2016

| The RES support scheme for 2014 was maintained | | Per unit support | Total (M€) |
|--|--|-----------------------------------|------------|
| Biofuels | | | |
| | Obligation/quota (7.5 % energy content) | - | - |
| | Penalty (€/toe of biofuel missing) | 2000 €/toe | |
| | Tax exemption (small specialist producers) | 405.92 to 465.92 €/m ³ | 0.59 |
| RES electricity | | €/MWh | |
| Production incentives - feed-in tariff | | | |
| Micro-generation | 8 years | 66 | - |
| | 7 years | 145 | - |
| Mini-generation - 15 years | | 106 | - |
| Photovoltaic | CPV | 380 | - |
| | PV | 257 | - |
| Forest biomass | | 119 | - |
| Biogas | | - | - |
| Renewable cogeneration | P < 2MW | 82.47 ^(*) | - |
| | 2MW < P ≤ 100MW | 66.97 ^(*) | - |
| Wind | | 74-75 ^(**) | - |
| Hydro | Up to 10 MW inclusive | 95 | - |
| | > 10MW and ≤ 20MW | 91-94 | - |
| Municipal solid waste | | - | - |
| Production incentives – feed-in tariff (additional cost above market rates) | | | |
| Micro-generation | | 126.9 | 39.14 |
| Photovoltaic | | 312.5 | 155.14 |
| Biomass | | 101.6 | 78.47 |
| Biogas | | 96.4 | 27.82 |
| Renewable co-generation | | 48.3 | 80.97 |
| Wind | | 71.8 | 894.82 |
| Mini-hydro | | 80.5 | 84.98 |
| Municipal solid waste | | 65.7 | 31.05 |
| Total annual estimated support in the electricity sector | | 65.8 | 1392.39 |
| Total annual estimated support in the heating sector | | Not applicable | - |
| Total annual estimated support in the transport sector | | | 0.59 |

(Source: DGEG, ERSE)

(*) Average quarterly reference tariffs for 2014

(** *)During phase A of wind tenders – discounts applied to the 5 % tariff

During phase B of wind tenders - discounts applied to the 5 % tariff during initial phase and 9% after renegotiation of the contract

During phase C of wind tenders – discounts applied to the tariff between 5.15 % and 23.15 %

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

In accordance with the Regulations on Commercial Relations (RRC), the Energy Services Regulatory Authority (ERSE) requires that all electricity traders include information in their invoices on the origin of the electricity which they acquire and sell to their customers and also the environmental impact of supplying such electricity.

In compliance with Recommendation No 2/2011, which is a document setting out principles and best practice for ensuring quality labelling and explaining the methodologies to be followed and the obligations of traders as regards the labelling of electricity, the ERSE publishes an annual report on compliance with the aforementioned Recommendation by each of the traders.

For information on this issue for the years 2015 and 2016, please visit the following website:

<http://www.erse.pt/pt/desempenhoambiental/rotulagemenergetica/Paginas/default.aspx>

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, it should be noted that in the case of biofuels produced using residues, waste, non-food cellulosic material and ligno-cellulosic material, the application of double counting has been maintained in Portugal when biofuels vouchers (BVs) are issued in line with the provisions of Article 21(2) of Directive No 2009/28/EC. Also, in the case of small specialised producers, the exemption from the ISP tax (on oil and energy products) has been maintained up to an overall maximum limit of 40 000 t/year in the case of biofuels 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)

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. Work to get the Issuing Authority up and running is underway.

6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purposes (Art. 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 raw material imported from third countries (ktoe). | |
|---|---|---|--|-------|---|-------------|--|-------------|--|-------------|--|-------------|
| | 2015 | 2016 | 2015 | 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 | 2015 - 2016 |
| Biomass supply for heating and electricity: | | | | | | | | | | | | |
| Direct supply of wood biomass from forests and other wooded land for energy generation (fellings, etc.)** | 955 | 1,092 | 168 | 201 | 7 | 3 | 1 | 1 | - | - | - | - |
| Indirect supply of wood biomass (residues and co-products from the wood industry, etc.)** | 4,691 | 4,688 | 1,208 | 1,232 | 0 | 12 | 0 | 5 | - | - | - | - |
| Energy crops (grasses, etc.) and short rotation trees (please specify) | - | - | - | - | - | - | - | - | - | - | - | - |
| Agricultural by-products / processed residues and fishery by-products** | 13 | 0 | 5 | 0 | 7 | 0 | 3 | 0 | - | - | - | - |
| Biomass from waste (municipal, industrial, etc.)** | MSW (kton): 1,171 Biogas (m3): 152,639,731 | MSW (kton): 1,199 Biogas (m3): 145,642,447 | 270 | 279 | - | - | - | - | - | - | - | - |
| Other (please specify) | | | | | | | | | | | | |
| 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) | - | - | - | - | - | - | - | - | - | - | - | - |
| 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

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

| Land use | Surface (ha) | |
|---|--------------|------|
| | 2015 | 2016 |
| 1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed , sunflower, etc.) and soya (legume) | 1287 | 1797 |
| 2. Land used for short rotation trees (willows, poplars) (please specify main types). | - | - |
| 3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum (please specify main types). | - | - |

(Source: IFAP - M. Agriculture and Fisheries)

The information reported in Table 4a refers to the total area devoted to the production of soya and rapeseed, including that which is specifically allocated to energy production.

7. Please provide information on any changes in commodity prices and land use within your Member State in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources Please provide links to relevant documents describing this impact in your country where these are available (Article 22(1)h) of Directive 2009/28/EC).

Although there has been an increase in the intention to use biomass following the licenses awarded to various plants, there was no change in this period in the prices due to an increase in consumption for energy-related purposes.

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: Production and consumption of Art. 21(2) biofuels (ktoe)

| Biofuels, Article 21(2) ²⁶ | 2015 | 2016 |
|---|----------------|----------------|
| Total production Art. 21.2 biofuels | 38.98 | 109.39 |
| Total production Art. 21.2 biofuels | 38.98 | 109.39 |
| % share of Art. 21.2 fuels from Total RES-T | 11.46 % | 39.50 % |

*Corresponds to the trans-esterification of used cooking oil and animal fat

²⁶ Biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material

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 the preceding 2 years. Please provide links to relevant documents describing this impact in your country where these are available (Article 22(1j) of Directive 2009/28/EC).

Given the low levels of endogenous agricultural material used in the production of biofuels and that the stipulated sustainability criteria are being met, there does not appear to be any impact on biodiversity, water resources or soil quality at national level.

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

Table 6: Estimated GHG emission savings from the use of renewable energy (tCO₂eq)

| Environmental aspects | 2015 | 2016 |
|---|-------------------|-------------------|
| Estimated net GHG saving from the use of renewable electricity* | 5 623 774 | 5 838 100 |
| Estimated net GHG saving from the use of renewable energy in heating and cooling** | 6 699 131 | 6 892 662 |
| Estimated net GHG saving from the use of renewable energy in transport*** | 1 056 702 | 858 958 |
| Total estimated net GHG emission saving from using renewable energies²⁷ | 13 379 607 | 13 589 721 |

*The GN conversion factor was used rather than that recommended by the Commission (56.1 g CO₂eq/MJ)

**The conversion factor recommended by the Commission was used (87 g CO₂eq/MJ)

***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/CE).

²⁷ 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.

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)^{28, 29}

| | Year n-2 (2009) | Year n-1 (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) | - | - | 83.0 | 82.0 | 83.9 | 144.4 | 127.6 | 153.9 | 80.8 | 130.9 | -4.3 | 49.5 |

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

Please note that none of the cooperation mechanisms set out in the Directive were implemented in the period 2015-2016. However, negotiations are underway about the possibility of a protocol with another Member State for statistical transfers.

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 used are supplied on an annual basis by electricity producers and they take account of EU recommendations, in that 50% of the raw material used should be considered to be renewable.

²⁸ 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.

²⁹ When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. - x toe).