

PORTUGAL

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Country Data

Area: 92,225 sq km.
Population: 10.3 million.
Population density: 112 persons per sq km.

Electrical Energy Sector Overview

Total installed capacity (end of 2015): 20,160 MW.

Total installed capacity of Renewable technologies (end of 2015): 12 227 MW.

Energy Sources	MW	%
Thermal (fossil)	7,933	42.0
Hydro	6,024	29.8
Geothermal	29	1.4
Wind	5,013	24.8
Solar PV	455	2.2
Biomass	735	3.6

In 2015 the renewable electricity undertook the leading position as the main contributor to the Portuguese Mainland production, despite the fact that it was a dry and hot year. Overall renewable energy sources contributed with 48.2 % to fulfil the global consumption, the remaining 47.3% share came from fossil fuels and 4.5% from the net import-export balance.

During last year, the normalized renewable electricity production was around 52,2 %, value lower than expectations in order to reach the 60% of renewable in the national electrical mix in 2020. This figure leaves a clear message that it is necessary to rethink the future energy strategy, namely the national energy plan, the renewable targets and incentive mechanisms for investments in the sector.

Since the beginning of 2015, RES-E sector is struggling with lack of deployment policies. Presently, with the publishing of decree-law 215-B/2012, FiT for large scale renewable power plants was extinguished. New RES-E projects have no incentive mechanisms; they have integrated in the regular energy market. This 2012's decree-law considers capacity auctions but to date no new procedures were opened. Although, the new wind farms expected to be installed in Portugal had their licensing process started before decree-law 215-B/2012, which means these farms will receive FiT.

The RES plants with FiT will gradually be transferred to market regime from 2018 and there is still no clear

strategy how this will occur. So, investments in the field have stopped. In June 2014, it was published the framework for wind farms' overpowering that sets a FiT of 60€/MW for the over-equipment to be installed and defines the concept of additional capacity, enabling the removal of existing limitations on the injection of electricity. This additional capacity is approximately 20% of the initial power capacity installed in the wind farm.

The metering and technical specifications were published in order n.º 102/2015. The metering guidelines require individual metering, which increases the investment cost, or a discount rate in production is applied. This led to a hold down the investment in over-equipment and reduces the expectation power raising for wind sector.

By October of 2014, the new self-consumption and FiT regime regulation for small units has been published (decree-law 153/2014), which repeals the old FiT scheme (micro and minigeneration). It defines rules for self-consumption systems with grid-connection, which had no regulation before, and new rules for FiT scheme (systems under 250 kW). The regulation is fully operational. The regulation is fully operational. It is estimated that the installed solar PV power under this scheme can reach up to 300 MW in 2020, which is a poor contribution of the overall system, when Portugal has a great natural capacity. Since January 1st of 2015, the Green Tax Reform has been under implementation. It was established that a new value for the maximum tax depreciation of wind and solar technologies has set at 8%, which represents twelve and half years (minimum is twice this value). The proposal of reducing 50% of the Municipal Real Estate tax (IMI) for RES power producing buildings was accepted and will be carried out within five years, though the conversations between representatives of the sector and the government regarding the most accurate method to calculate the IMI for wind and PV power plants is still going on.

Regarding the compensation regime applicable to RES-E promoters published in February 2013, SHP promoters keep on trying to reach an agreement with the Government. Likewise, promoters also expect a revision of the new licensing regime published in August 2013, which has set deadlines hard to comply with that can jeopardize RES-E projects.

Wind Energy Sector Overview

Installed capacity of wind energy (end of 2015):
5,013 MW.

In Portugal the potential for electricity production from onshore wind energy is quite important. However, more than half of it is already in use. The best sites are already occupied, and the ones with wind resource still available are often conditioned by a set of different conditions, like environmental or land planning constraints and lack of grid infrastructure, just to mention the most important.

At the end of 2015, the total installed power of Wind was 5 013 MW, distributed in 255 wind farms, with a total of 2 590 wind turbines.

The total installed power of wind offshore was 2 MW, due to the Windplus project. This project is receiving support from the European Commission, through the NER 300 programme, and from the Portuguese Government through the Portuguese Carbon Fund. Within the scope of the Windplus project more 5 wind turbines are expected to be installed.

The correspondent electricity production was able to supply 22.1 % of total consumption in the country. The average equivalent production in 2015 were 2346 hours. The average equivalent production in 2010 were 2494 hours and in 2005 it were 1860 hours.

The Portuguese National Renewable Energy Action Plan (Plano Nacional de Ação para as Energias Renováveis) in accordance with Directive 2009/28/EC on the promotion of the use of energy from renewable sources, indicates a target for 2020 of 5300 MW for wind power. These plan, was prepared in accordance with the template published by the Commission, and provide detailed roadmaps of how each Member State expects to reach its legally binding 2020 target for the share of renewable energy in their final energy consumption.

The implementation of the “National Program for Dams with High Hydropower Potential”, known as PNBEPH, is expected to increase the pump storage capacity, and thus reduce the limitations of wind production during off-peak hours..

Wind Energy Resource Information

APREN & Megajoule - Wind Index: APREN, in partnership with Megajoule, publishes a quarterly Wind Index for Portugal Mainland, which the quantification of the fluctuations in the production of electricity from a wind farm around the average value. Such fluctuations are characteristic of the wind regime specific to each geographical area. This index should allow owners and grid operators to quantify wind variability and help for a clearer assessment of the operational performance of wind farms. Available at:

http://www.apren.pt/fotos/editor2/16mjr005_apren_publicacao_do_ie_trimestre_4_2015.pdf

E2p – Energias Endógenas de Portugal: The project E2P - Endogenous Energies of Portugal, results from the collaboration between APREN and INEGI and consists in the development of an online database of all renewable energy power plants. The database includes relevant information on existing power plants, such as installed power, technology in use, location and name of the promotor. The reports of wind farms previously published by INEGI are also available at this platform. Available at <http://e2p.inegi.up.pt/>

APREN – Yearbook presents a small illustrated database from all the renewable power plants in Portugal belonging to APREN's associates. The 2016 edition, with data from 2015, is expected to be published in April 2016. Available upon demand.

REN – Wind Energy in Portugal 2014: Presents the main numbers for 2014 concerning electricity generation from wind power in Portugal Mainland. Available at:

<http://www.centrodeinformacao.ren.pt/PT/publicacoes/EnergiaEolica/A%20Energia%20E%C3%B3lica%20em%20Portugal%20-%202014.pdf>

Wind Energy Legislation

- Order no. 102/2015, of 7 of April of 2015: Sets the metering and technical specifications for wind power.
- Decree-law 153/2014, of 20 of March of 2014: Establishes the new self-consumption and FIT regime regulation for small units, which repeals the old FiT scheme (micro and mini-generation). It also defines rules for self-consumption systems with grid-connection, which had no regulation before, and new rules for FiT scheme (systems under 250 kW).
- Decree-Law no. 94/2014, of 24 of June of 2014: Establishes the framework for wind farms' overpowering and defines the concept of additional capacity, enabling the removal of existing limitations on the injection of electricity.
- Decree-law n.º 35/2013: Establishes a possibility to adhere, by the renewable power plants promoters, to an alternative remuneration regime, beyond the period of the guarantee remuneration.
- Order no. 431/2012, of 31 of December: Sets the annual quota of micro generation at 11 MW.
- Order no. 430/2012, of 31 of December: Sets the annual quota of mini generation at 30 MW.
- Decree-Law no. 215-A/2012 and 215-B/2012, of 8 of October: Establishes the general principles governing the organization and operation of the National Electricity System (SEN) as well as the general basis for the exercise of the activities of generation, transmission, distribution and sale of electricity and the organization of electricity markets.
- Decree-Law n. 25/2012, of 6 of February: Suspends with immediate effect and indefinitely, the allocation of power injection at Public Service Electric Grid (i.e., a

moratorium on RES-E).

- Dispatch no. 16327/2011, of 2 of December: Prohibits the submission of applications for prior information (PIPs) in 2012, one of the procedures for new power allocation.
- Order no. 284/2011, of 28 of October: Reduces the annual quota of micro generation from 25 MW to 10 MW.
- Order no. 285/2011, of 28 of October: Reduces the annual quota of mini generation from 50 MW to 30 MW.
- Memorandum of Understanding (MoU) for the Bailout of the Portuguese Economy signed with the European Central Bank, International Monetary Fund and European Commission, of 4 of May 2011: Imposes some measures to the Portuguese government related to the energy sector, and in particular with the reduction of costs from production of RES electricity.
- Decree-Law no. 34/2011, of 8 of March: Establishes the applicable legal frame concerning the generation of electricity through small power plants, regularly known as mini production units.
- Decree-Law no. 141/2010, of 31 of December: Proceeds to the transposition of Directive no. 2009/28 from the European Parliament and Council dated April 23rd, into the national legal system, namely in what concerns the usage of renewable energy sources' promotion.
- Decree-Law no. 118-A/2010, of 25 of October: Simplifies the applicable legal frame concerning the generation of electricity through small power plants, regularly known as micro production units.
- Decree-Law no. 51/2010, of 20 of May: Proceeds to the simplification of the wind farms installation procedure and alters Decree-Law no. 225/2007, dated May 31.
- Government Resolution no. 29/2010, of 15 of April: Approves the National Strategy for Energy 2020, frequently called as ENE 2020.
- Decree-Law no. 363/2007, of 2 of November: Establishes the legal system applicable to electricity through micro production units, namely through the approval of several simplification measures concerning the legal procedures to access the activity.
- Decree-Law no. 225/2007, of 31 of May: Gives new wording to Articles 4, 5 and 6 of Decree-Law No. 33-A/2005, 16 February regarding feed in tariff.
- Decree-Law no. 33-A/2005, of 16 of February: Amending Annex II of Decree-Law No. 189/88 of May 27, reviewing the factors to calculate the feed in tariff and setting procedures for allocation of available power and deadlines for obtaining a license for establishment of renewable energy power plant.
- Decree-Law no. 339-C/2001, of 29 of December: Amending Decree-Law No. 168/99 of May 18, revising the rules governing the activity of electricity production within the independent electrical system.
- Decree-Law no. 312/2001, of 10 of December: Defines the management regime of the reception capacity in the national grid of electricity coming from independent producers.
- Decree-Law no. 168/99, of 18 of May: Introduces

alterations on the legal dispositions foreseen on Decree-Law no. 189/88, dated May 27.

- Decree-Law no. 189/88, of 27 of May: Establishes rules and regulations concerning the electricity generation activity, through individual or legal entities, under the public or the private practice.

The Decree-Law 189/1988 has established the rules for electricity production from renewable resources, and opened the market to independent producers, still only of small hydro power. In 1992 the first wind farm was established in Portugal, but the market only really began in 1999, with the introduction of Feed in Tariffs. The Decree-Law 312/2001 has given a new boost to the sector defining a system to obtain grid connection access, which had a massive demand. In 2005 a three phases tender for 1'800 MW was released. The installation of the power granted by this tender only started in 2008 and will continue until 2014.

Wind Energy Projects

At the end of 2015 there were 124 wind turbines under construction, resulting in a capacity of more than 249 MW.

A list of all wind energy projects is available at e2p website (<http://e2p.inegi.up.pt/>).

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