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Portugal

RENEWABLE ENERGY

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This country-specific Q&A provides an overview of renewable energy laws and regulations applicable in Portugal.

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PORTUGAL
RENEWABLE ENERGY

1. Does your jurisdiction have an established renewable energy industry? What are the main types and sizes of current and planned renewable energy projects? What are the current production levels?

Portugal was among the first countries in the world to set 2050 carbon neutrality goals. Portugal's energy and climate policies push for carbon neutrality primarily through broad electrification of energy demand and a rapid expansion of renewable electricity generation, along with increased energy efficiency. There is a strong focus on reducing energy import dependency and maintaining affordable access to energy. These policy goals are supported through clear targets, detailed national strategies and a wide range of regulations, economy-wide programmes, and sector-specific measures.

The National Plan for Energy and Climate 2020–2030, approved by the by Council of Ministers Resolution No. 53/2020, of July 10 (the "PNEC 2030") establishes national goals for the 2030 horizon for the reduction of greenhouse gas emissions (45% to 55%, compared to 2005), for the incorporation of renewable energy (47%) and for energy efficiency (35 %), interconnections (15%), energy security, internal market and research, innovation and competitiveness.

The PNEC 2023 is currently being reviewed and shall increase the current targets, while implementing policies and measures for its fulfilment and an effective application of the guidelines contained in the Roadmap to Carbon Neutrality 2050 (RNC2050).

The Portuguese electricity generation park has undergone a paradigm shift with regard to the origin of the main sources of supply in the past two decades. As of 2005, there was a gradual increase in the installed renewable power, with the power generation park now having 52% more installed power than that verified that year. In turn, since 2011 the installed fossil power has been showing a reduction that was even more evident in 2021 with the deactivation of the Sines and Pego plants.

Portugal's domestic energy production comes from renewable energy (mainly bioenergy, wind and hydro) and a small share from non-renewable waste. The increase use of renewable endogenous sources in renewable electricity generation has been changing the Portuguese electricity production mix and has been playing an increasingly active role in the supply of the Portuguese Electricity needs.

The greater use of Portuguese endogenous and renewable resources for electricity production has changed the composition of the electricity production mix in Portugal and has, consecutively, played an increasingly determinant role in the satisfaction of consumption.

Portugal produced a record amount of renewable energy last year: 31.2 TWh.

Wind energy supplied 25% of consumption in Portugal, hydroelectric power 23%, photovoltaics 7% and biomass 6%. There was a 70% year-on-year increase in hydroelectric production, compared to the particularly dry year in 2022, as well as a 43% increase in photovoltaic production, due to the progressive increase in installed capacity.

Non-renewable production supplied only 19% of consumption, totalling 10 TWh, the lowest figure since 1988. This is due not only to the greater availability of renewable energy, but also to the high import balance, which supplied 20% of consumption, the highest figure ever and its largest share in supplying consumption since 1981.

Electricity consumption supplied from the public grid in 2023 reached 50.7 TWh, an increase of 0.8% on the previous year, or 0.6% when correcting for the effects of temperature and the number of working days. This is the highest consumption since 2018 and is around 3% off the all-time high recorded in the national system in 2010.

For 46 years, renewable energy generation has not had such significance in meeting electricity consumption needs in Portugal. In April 2024, renewables supplied 94.9% of consumption, nearing the 95.4% reached in May 1978. It is the fourth consecutive month with values above 80%, following 91% recorded in March, 88% recorded in February, and 81% recorded in January.

A public free accessible database with relevant information about all power generation centres using renewable energy sources in Portugal, sponsored by APREN in collaboration with INEGI, is accessible through the following link: https://e2p.inegi.up.pt/?Lang=PT

Portugal has one of the most ambitious plans in Europe for offshore wind farms, envisaging the installation of 10 gigawatts (GW) of offshore wind capacity and the offshore wind auctions are expected to be launched this year by the Government. The first offshore wind farm in Portugal was developed by Windfloat Atlantic, a consortium comprising EDP, Engie, Repsol and Principle Power.

The sector lives essentially on private investment, with a fragmented market, high competition and different investors and developers profiles. The M&A market on the this sector remains very active.

Solar and wind energy are the main focus of investment, and it is expected that by 2030 this direct investment in power stations based on Renewable Energy Sources will amount to approximately 32 billion euros.

In addition, it is expected that, by 2030, investment in batteries, pumping and electrolysers will amount to a cumulative value of approximately 3.7 billion to achieve the targets set in the PNEC2030 for storage and electrolysis capacity.

Finally, considering that Portugal's new centre-right minority government took office recently, it remains uncertain whether the energy policy will have any deviation and if the announced projects will be launched on the same terms.

The outgoing government prepared a "transition folder" addressing what considers to be the most relevant projects that are under development in various areas, such as the energy sector. It was already revealed that investment intentions in renewable energies in Portugal amount to 60 billion euros, which represents 25% of the country's Gross Domestic Product (GDP).

2. What are your country's net zero/carbon reduction targets? Are they law or an aspiration?

The Portuguese legal framework of the energy sector is aligned with the EU policy and its internal market, targeting the achievement of carbon neutrality by 2050.

The PNEC 2030 sets the policy goals to be reached by Portugal on its path to carbon neutrality in 2050, while is currently being reviewed to increase the ambitious goals already outlined. This first working version sets new goals set out from a total of 43.2 GW of installed renewable capacity by 2030, a significant increase from the previous 27.5 GW.

Carbon neutrality by 2050 is based on a reduction of emissions between 85% and 90% by 2050, compared to 2005, and offsetting the remaining emissions through the sink provided by land use and forests, while Portugal might be able to anticipate the goal of carbon neutrality to 2045.

The trajectory towards neutrality makes it possible to anticipate reductions in greenhouse gas emissions between -45% and -55% in 2030 and between -65% and -75% in 2040, compared to 2005.

Among the legal instruments in force on climate change and in addition to the above-mentioned PNEC 2030, RNC2050, the National Hydrogen Plan (NH2P), the Biomethane Action Plan 2024-2040 and the Long-Term Strategy to Adress Energy Poverty 2023-2050 are worth mentioning.

The periodic updates of the RNC2050 allow a cohesive transition and with the active participation of entities from different levels of territorial organization, from regional agents and closer to the citizen, deepening the targets at the level sectoral, regional and/or intermunicipal, while adjusting them in light of progress achieved.

3. Is there a legal definition of 'renewable energy' in your jurisdiction?

In Portugal, renewable energy is legally defined as electricity generated from non-fossil renewable sources, notably wind, solar, aerothermal, geothermal, hydrothermal, ocean energy, hydropower, biomass and renewable gases.

4. Who are the key political and regulatory influencers for renewables industry in your jurisdiction and who are the key private

sector players that are driving the green renewable energy transition in your jurisdiction?

The Portuguese regulatory authority for electricity, natural gas, liquefied petroleum gas in all categories and the fuel sectors is Energy Services Regulatory Authority ("ERSE"), a public entity with administrative and financial autonomy, which is also responsible for regulating the national electric mobility plan.

ERSE's mission is to adequately protect customer interests, promote competition between market agents, contribute to the progressive improvement of environmental and economic conditions concerning the sector, and arbitrate some disputes.

ERSE also has the power to issue regulations intended to govern the organisation, operation and compensation of the energy sector, from generation to supply and trading. Some of the most relevant of these are the Regulation on Self-Consumption, Regulation on Trade Relations, the Tariffs Regulation, the Regulation on Smart Grids, and the Regulation on the Management of the Electric Mobility Network Operations.

Besides ERSE, the Directorate-General for Energy and Geology ("DGEG") is a state-administered entity whose mission is to contribute to the planning, promotion and development of the state's policies regarding energy matters and the exploitation of natural resources.

The DGEG is frequently the competent entity for granting licences and other administrative authorisations concerning energy-related activities, such as production, establishment or exploitation.

In summary, whereas ERSE is the independent regulatory authority, the DGEG is the body that represents the state in respect of energy issues, granting licences and receiving the corresponding submissions.

The National Entity for the Energy Sector (ENSE) is a public organisation that has numerous responsibilities over the energy sector, including serving as the Portuguese central stockholding entity with responsibility for oil reserves. The ENSE also supervises the generation, transmission, distribution and sale of electricity; conducts inspections of energy sector facilities and infrastructures; investigates energy sector accidents; monitors compliance with licensing obligations; and supervises third-party access to storage, transport and distribution infrastructure in the fuels sector.

Finally, the APA is the Portuguese regulatory authority on hydric resources, waste and dam safety, having broad powers in relation to other environmental matters, the most important being as the entity responsible for conducting environmental assessments of projects related to the energy market. Having important powers in licensing and policy matters, the APA has authority to carry out its duties, namely, to ensure the safety of public domain assets under its administration, prevent and control infringements, and enforce sanctions for illegal activities.

Private participants are found throughout the electricity value chain. Electricity generation is open to competition. The Portuguese system currently uses a wide range of primary energy sources and technologies (gas, water, waste, wind, biomass and solar).

The main electricity generators in Portugal (fossil and hydro resources) are currently EDP – Gestão da Produção de Energia, Turbogás, Tejo Energia, Endesa Generation and Movhera Hidroelétricas do Norte (a consortium led by ENGIE). As regards renewable energy generation (other than large hydro), some of the main generators are EDP Renewables, Galp, Finerge, Iberwind (Ventient Energy), Trustenergy, Endesa and Generg.

Among other worth mentioning private sector players, the green renewable energy transition in our jurisdiction is being driven by Iberdrola, Voltalia, Lightsource BP, GreenVolt, Acciona, Infraventus, Brookfield—Global Asset Management, Chint Solar, RP Global and Aquila.

5. What are the approaches businesses are taking to access renewable energy? Are some solutions easier to implement than others?

The self-consumption schemes (individual or collective) and microgrids, hybridisation, re-equipment and over-equipment, are among preferred options to business access renewable energy. The M&A sector, along with the Guarantees of Origin (GO) market, also play an important role.

Self-consumption power plants (UPACs) are generating plants intended for self-consumption, with the possibility to sell surplus energy in the market, while small-scale production units (UPPs) are generating plants with up to 1MW of installed capacity and sell all energy produced in the market.

Self-consumption plants may be of any source of technology of generation of renewable energy, but the most common is solar photovoltaic, usually installed on roofs or car parks near the consumption units.

These schemes allow consumers to share local electricity generation from one or more self-consumers. Renewable energy communities may share and trade the renewable energy produced by UPACs among their members.

From 2022, electro-intensive consumers are allowed to install remote self-consumption power plants. If grid capacity rights are granted, self-consumption plants can inject excess power into the grid, which is sold at market prices.

An exceptional legal procedure for allocating connection capacity to electricity consumption facilities in high-demand areas was implemented, through Decree-Law 80/2023 of 6 September, enhancing the grid access conditions required to implement industrial investments and addressing the existing grid-connection capacity constraints.

This regime ensures predictability for industrial investments and already designates Sines as a high-demand area.

Small-scale production units are decentralised and sell their output to the public networks – as a rule, distribution networks. They can operate under general remuneration (merchant) or guaranteed remuneration schemes. A simpler licensing regime applies to these plants, due to their small installed and injection capacity.

On its turn, business may recourse to an interconnected set of electricity wires distributing energy in a given location, typically owned by private parties outside existing public network concession agreements.

Microgrids may be developed within a confined area by owners and users of a self-consumption plant. The operator of the closed distribution network has the same duties as the distribution grid operator, in particular to ensure access of energy suppliers to the grid. It is free to set the closed network use tariffs.

Hybridisation, re-equipment and over-equipment are attractive options for developers since they are exempt from grid capacity title allocation, despite subject to the prior control scheme.

Finally, a GO is mandatory issued for each MW produced from renewable sources (or from an efficient combined heat and power plant), providing evidence of the source of the energy being acquired. Producers may sell GO together with the renewable energy generated or separately, in organised markets or through bilateral agreements. The consumption of renewable energy may be done by cancelation of the GO.

GO´s issued to generators receiving a feed-in tariff are transferred to DGEG and periodically bided on a periodically organized public auction.

6. Has the business approach noticeably changed in the last year in its engagement with renewable energy? If it has why is this (e.g. because of ESG, Paris Agreement, price spikes, political or regulatory change)?

The unstable macro geopolitical theatre brought an evolving energy and food security crisis, alongside with inflation, higher costs of capital and supply chain challenges.

However, powering up the transition away from fossil fuels as a response to the energy crisis has never had quite so much momentum.

The regulatory landscape plays a crucial role in the renewables sector. While the legal framework for ESG evolves and becomes mandatory, we anticipate relevant changes in the business models, capital structures and assets management, which shall play an important role to enhance the renewable sector growth and boost sustainable investments.

Most of the traditional energy intensive industries, such as cement ad paper mills, have added photovoltaic generation to their energy mix and this trend is expected to increase.

Price volatility and merchant risk gained higher relevance, considering over the last months Portugal registered the lowest wholesale electricity prices in Europe.

Industry is working hand in hand with universities on applied research for carbon sinks and carbon storage, less energy-intensive production methods and new renewable energy applications.

7. How visible and mature are discussions in business around reducing carbon emissions; and how much support is being given from a political and regulatory perspective to this area (including energy efficiency)?

Portugal has been taking the lead in some well succeeded initiatives at the European level and has clearly established as a priority the energy sector and climate targets.

The Government allows for the involvement of the main stakeholders on the policy design processes.

European and national strategies have been adjusting to current unprecedent context, with a strong focus on reinforcing security of supply and lowering costs for consumers, with renewables showing up as the key for all those targets.

Policy is shaped by all events which are shaping the energy sector, and further changes and adjustments to market design and to regulatory and legislative mechanisms may be necessary to respond to them. Governments and policymakers are, however, showing acute sensitivity to the issues and at stimulating sound investment.

The Environmental Fund (Fundo Ambiental) it is the main financing instrument for environmental policy and climate action in Portugal. It is also an intermediary entity for various components of the Recovery and Resilience Plan in terms of climate action.

Revenues from the auctioning of European Emissions Trading (ETS) allowances are one of the most important sources of revenue for climate action, being transferred to it to support measures in this area. These revenues should be used to promote development based on a competitive, low-carbon economy and to finance national climate policy in compliance with national, European and international commitments in terms of climate change.

It aims to support environmental and climate action policies for the pursuit of sustainable development objectives, contributing to the fulfilment of national and international goals and commitments, namely those relating to climate change, renewable energy sources and energy efficiency, water resources, waste, conservation of nature and biodiversity, the welfare of companion animals, forestry and forestry management, planning and management of the landscape.

The Environmental Fund finances entities, activities or projects that fall within, among others, the energy efficiency, energy from renewable sources, self-consumption and renewable energy communities and combating energy poverty.

ESG practices are also being increasingly widespread and mandatory for companies and business. Investors and consumers are increasing their awareness and prioritizing measures to reduce its carbon footprint.

It is worth mentioning the legal regime for the voluntary carbon market, recently created through Decree-Law 4/2024.

The voluntary carbon market focuses on types of greenhouse gas (GHG) reduction projects and carbon sequestration projects that promote the mitigation of GHG emissions, subject to specific criteria regarding eligibility, accounting of emissions and monitoring, reporting and verification measures, by an independent entity.

It comprises (i) GHG emission mitigation projects; (ii) recognized carbon methodologies for each type of project; (iii) the project certification system and respective credits; (iv) a platform for registering GHG emission mitigation projects and carbon credits; (v) carbon market agents; (vi) the competent authorities.

The voluntary carbon market agents will be the promoters of GHG mitigation and emission projects, the individuals and organizations, private or public, that acquire or use carbon credits and the entities responsible for certification.

The development and assessment of carbon methodologies will be the responsibility of a technical monitoring committee with representatives from the relevant organizations, coordinated by APA, I.P.

GHG emission reductions or carbon sequestration obtained through projects within the scope of the voluntary carbon market will generate carbon credits that correspond, each one, to one tonne of CO2. These credits can take the form of future carbon credits or verified carbon credits, which can be traded, and the flow of credits between market agents must be registered on the project and carbon credit registration platform, which will be developed by the Portuguese Energy Agency (ADENE).

Carbon projects shall be subject to an initial validation process and a periodic verification process by an independent verifier, duly qualified.

8. How are rights to explore/set up or transfer renewable energy projects, such as solar or wind farms, granted? How do these differ based on the source of energy, i.e. solar, wind (on and offshore), nuclear, carbon capture, hydrogen, CHP, hydropower, geothermal and biomass?

The main bottleneck of the electricity system is access to Grid.

Generally, any promoter wishing to develop a renewable energy generation power plant in Portugal will be subject to prior control procedures and must obtain:

The allocation of reserve injection capacity in the public service transmission grid ("RESP") consists of a title issued in the following modalities:

- General access modality;
- Modality of agreement between the interested party and the operator of the RESP;
- Modality of competitive procedure.

After securing a reserve injection title, it will be required to obtain a production licence from DGEG before starting power plant construction, a construction licence from the municipality where the power plant is located also before starting construction, eventually an establishment licence to construct the grid connection infrastructure and an operation licence from DGEG after the power plant construction works end and following DGEG inspection of the plant.

Depending on plant size and capacity and the environmental status of the land, the licensing of power plants may also include an environmental impact declaration or environmental assessment declaration and, for biomass plants, an environmental licence.

As a general rule, when a renewable energy power plant is ready to start operation and after inspection by the Directorate-General for Energy and Geology (DGEG), it applies for an operation licence (or operation certificate, depending on the installed power of the plant) from DGEG.

However, a temporary regime created by Decree-Law No. 30-A/2022, of 18 April, allows for power plants to start operating without an operation licence or operation certificate, insofar as the grid operator confirms grid injection conditions are met. In this case, the operation licence or certificate must be obtained within three years of the communication to the authorities that the plant has started operating.

This Decree-Law was in force for two years, i.e. until April 19, 2024. Recently, Decree-Law no. 22/2024 of March 19 has been published, extending the validity of these exceptional measures until December 31, 2024.

This extension aims to ensure the continued implementation of the measures that have contributed to achieving the goals of energy transition and reducing dependence on fossil fuels, in the current Portuguese political context and until the new government decides whether these measures should remain in force.

Other licences may be required to operate renewable projects, depending on their specific characteristics.

9. Is the government directly involved with the renewables industry? Is there a government-owned renewables company or are there plans for one?

No. In line with the requirements of the Third Energy Package, the Portuguese electricity sector is almost fully liberalised and fully privatised and there are no plans to set a government-owned renewables company.

In 2012 Portugal saw significant regulatory changes in the electricity sector. Apart from partial privatisation of the former incumbent Energias de Portugal, SA (EDP) and the transmission operator Redes Energéticas Nacionais, SGPS (REN), substantial modifications to the legislation regulating the sector were also approved in order to transpose the Third Energy Package.

10. What are the government's plans and strategies in terms of the renewables industry? Please also provide a brief overview of key legislation and regulation in the renewable energy sector, including any anticipated legislative proposals?

Portugal is committed to achieving carbon neutrality by 2050, as a contribution to the global and European goals assumed in the implementation of the Paris Agreement. Accomplishing this goal implies reducing greenhouse gas emissions by more than 85%, compared to 2005, and ensuring a carbon sequestration capacity of around 13 million tonnes.

The energy transition that is foreseen for the next decade will require more than 25,000 million euros of investment, which involves a complex concertation of wills and an alignment of policies, incentives, and means of financing. In order to facilitate this transition, a set of legal and planning instruments must be mobilized to achieve an effective reduction of emissions, while promoting investment, employment and innovation.

Decarbonization is also a strategy for investment and employment creation. Leading the energy transition implies an unequivocal commitment investing in renewable production which should more than double its installed capacity in this decade, reaching a level above 80% of renewables in electricity production. By 2030, Portugal should achieve a target of 47% renewable energy in gross final energy consumption and a target of 20% renewable energy in transport.

This decade is the one in which we must make the greatest effort to reduce greenhouse gas emissions,

which implies taking on ambitious decarbonization targets, incorporating renewable energy and energy efficiency. Ensuring a fair and inclusive transition is a necessary condition for the success of this vision.

The official program Government states that Portugal "needs a new generation of environment and energy policies" and confirmed 2045 as the deadline for achieving carbon neutrality. For such purpose and although only recently took office, the Government already committed itself to:

- Review the instruments governed by the PNEC 2030.
- Develop a National Energy Storage Strategy by 2026, with the aim of accelerating investment in national storage capacity, namely through batteries associated with wind farms and photovoltaics.
- Promote greater competition throughout the market, contributing to the diversification of projects and commercial offers that benefit consumers, with the aim of achieving prices below the EU average for industry and consumers in general.
- Guarantee the necessary regulatory stability and predictability for investment and strengthen the response capacity of the institutions responsible for licensing processes.
- Plan the reception capacity of the distribution and transport networks to accommodate the increase in production from renewable sources, given the existing bottlenecks, and seek commitments between Portugal, Spain and France for energy interconnections.
- Review the legislative framework for development and investment plans in national energy grids and adopt public policies that will lead Portugal back to a downward trend in the tariff deficit.

The above-mentioned commitments should be construed in addition to those assumed by the former Government, namely:

- Accelerate the implementation of the PNEC 2030 and RNC2050, promoting regional roadmaps for carbon neutrality, developing five-year carbon budgets that define a multi-year horizon, defining methodologies for assessing the legislative impact on climate action, and removing administrative constraints that create disproportionate context costs without environmental added value;
- Implement the Recovery and Resilience Plan (RRP)'s planned €610 million investment in energy efficiency, €300 million allocated for energy efficiency in residential buildings, with special attention to lower income households, and €310 million allocated for energy efficiency in the private sector and Public Administration service buildings, in accordance with the Program for Resource Efficiency in Public Administration (ECO.AP);
- Implement the RRP's planned €715 million investment in the decarbonization of industry;
- Implement the RRP's planned €185 million investment in hydrogen and renewable gases, including the creation of a network of hydrogen supply stations;
- Launch the hydrogen and biomethane auctions, to provide project promoters with support over a 10-year period, setting the price they will receive for injecting renewable gases into the grid.
- Increase solar energy production capacity, continuing auctions for new power plants and promoting and facilitating self-consumption and the creation of energy communities;
- Reinforce the electricity production capacity of existing wind farms and promote hybrid systems, reducing the need to build new infrastructure;
- Invest in offshore renewable production, consolidating and expanding the industrial cluster associated with the wind sector;
- Continue to promote a decarbonization-friendly ecosystem, with emphasis on planning and permitting processes;
- Foster the digitalization of the energy system and the development of smart electricity grids, creating better conditions for a significant increase in the electrification of consumption in the different sectors of activity;
- Promote the production of advanced and synthetic biofuels, including green ammonia and methanol, contributing to the decarbonisation of the national chemical and petrochemical and to the decarbonization of the transport sector, namely in air and maritime transport air and maritime transport;
- Assume that decarbonization can and should be a strategy for competitiveness and industrial valorisation, stimulating the incorporation of low-carbon processes, products and technologies, investing in the dynamization of innovation hubs and the creation of new business models, promoting the development of regional industrial

clusters and encouraging the widespread adoption of renewable energy sources in industry;
- Adopt a green tax in accordance with the fair transition goal with a progressive tax burden shift from labour to pollution and intensive use of resources, pursuing the elimination of environmentally harmful tax exemptions and benefits, and providing a clear tax advantage for electric and hydrogen vehicles, changing the tax framework of employers by encouraging public transport over individual transport and establishing incentives for energy efficiency, particularly in residential buildings;
- Promote sustainable financing by developing a strategy that defines the most appropriate instruments to be mobilized in accordance with the European Green Deal, defining minimum decarbonization criteria as a condition for granting public funding and defining a fiscal and financial framework that induces green investment;
- Promote the issuance of green bonds, encouraging the development of micro-credit platforms oriented towards investment in low-carbon solutions, promoting the articulation between the Fund for Innovation, Technology and Circular Economy and the Environmental Fund in supporting decarbonization projects and increasing efficiency in the use of resources.

The electricity sector in Portugal has been seeing significant legislation changes.

A profound reform of the power sector was enacted through Decree-Law No. 15/2022, which sets the organisation and functioning of the National Power System and is the main law governing the construction and operation of generation facilities.

This Decree-Law introduced significant changes to the entire value chain of the electricity sector, from generation to supply and to network operation, gathering the rules on all activities in the electricity sector, except for cogeneration and electric mobility activities. It required several new regulations and amendments to existing regulations, most of which already took place during 2023.

Progress has also been made in simplifying environmental licensing processes, with the publication of Decree-Law no. 11/2023. This Decree-Law eliminated several situations in which a case-by-case analysis would be necessary, the redefinition of thresholds that subject projects to the Environmental Impact Assessment (EIA), and the elimination of EIA to produce green hydrogen.

11. Are there any government incentive schemes promoting renewable energy (direct or indirect)? For example, are there any special tax deductions or subsidies offered? Equally, are there any disincentives?

The Portuguese national electricity system closely follows the European Union regulations and policies, and its main aim is to promote the use of renewable energy, currently with a focus on solar photovoltaic projects.

Renewable energy projects that were awarded a point of injection in the electricity grid up to October 2012 typically benefit from a feed-in tariff, which, until the wholesale electricity price rise in 2021, was historically above market prices. Wind farms account for the vast majority of these projects, in terms of installed power.

The Portuguese government has since abandoned the feed-in tariff support schemes (except for cogeneration and experimental projects regarding emerging technologies). Generally, projects are being developed using merchant schemes. No other support schemes, such as feed-in premium and green certificates, are in place.

Portugal’s energy sector policy aims to decarbonise the energy supply and reduce energy import dependency primarily through broad electrification and a rapid expansion of renewable electricity generation, along with increased energy efficiency.

There is also a strong focus on maintaining affordable access to energy. The PNEC describes the key support measures and actions to achieve the 2030 energy sector targets. Additional measures are defined in a wide range of laws, government decrees, regulations and standards. Funding for support measures comes from the state budget and several national funds targeting energy and climate priorities.

The government has established numerous taxes and fees that direct revenues to energy transition programmes and measures. Portugal also receives notable support for energy transitions and climate measures from EU funds.

A central aspect of Portugal’s energy policy is the Green Taxation Law (Law No. 82-D/2014), passed in 2014 to better align energy taxation and decarbonisation goals.

As part of the Green Taxation Law, Portugal established a carbon tax in 2015 that covers fossil fuel demand of consumers in all non-ETS (EU Emissions Trading System) sectors.

The level of the carbon tax is based on ETS prices with adjustment factors for each type of fossil fuel based on relative emissions and environmental impacts. The base rate of the carbon tax is adjusted annually to drive emissions reductions. The carbon tax is charged in addition to the energy products tax (ISP), which covers most energy demand in Portugal, including fossil fuels, electricity and heat.

A share of the revenues from the carbon tax and ETS allowance auctions are allocated to Portugal's Environmental Fund, which supports a wide range of government programmes, including some decarbonisation measures.

It is also relevant to note that the Portuguese targets under the Recovery and Resilience Program of the Portuguese economy to overcome the impact of COVID 19 pandemics are quite focused on the production of green hydrogen. For now, there is a State aid regime in place, but specific tax incentives are expected to be created in the near future.

From a tax perspective, it is relevant to note that Portugal has a number of incentives in place for the individual use of renewable energy, ranging from more favourable tax regime applicable to electric cars to the incentives to micro-generation.

Grid capacity for connection of power projects has become scarce, although network investment and development plans need to foresee investments aiming to create new capacity, in particular so as to accommodate grid connection requests, subject to approval of the government.

Considering this scarcity of grid injection capacity, the government has also been promoting access to the grid through competitive tenders (only for new renewable energy capacity) and open procedures for creation of revenue in anticipation of injection of new grid capacity through direct investment by the generator.

Additionally, the law foresees other possibilities of maximising the load factor of use of grid injection capacity, notably through hybridisation, repowering or overpowering. Competitive procedures already launched offer different sale schemes for generators to sell their output.

The former government planned to launch an auction for the centralized purchase of hydrogen and biomethane, to provide project promoters with support over a 10-year period, setting the price they will receive for injecting renewable gases into the grid.

12. Has your Government had to continue to help with the basic cost of energy over the last year and has that led to any discussion about de-linking the gas price and renewables prices?

In June 2022, the European Commission approved a measure in Portugal aimed at reducing the input costs of power stations that rely on fossil fuels, allowing the government to pay the difference between the cap and the market price, which jumped following Russia's invasion of Ukraine.

Under this measure, electricity producers were granted a subsidy to help cover their fuel expenses. The price cap was set at €40/MWh from June to December 2022, with an increase of €5 per month following the initial six months. The goal of this measure was to lower production costs and ultimately decrease wholesale electricity prices, providing a benefit to consumers.

The measure was set to expire on 31 May 2023. However, Portugal notified to the European Commission its intention to extend the original measure beyond May 2023 until 31 December 2023, while amending the price cap.

As part of this measure, the trajectory of the price cap will be adjusted to gradually phase out, with a steady increase from €56.1/MWh in April 2023 to €65/MWh in December 2023, eventually aligning with expected gas market prices by the end of 2023.

The European Union has agreed to extend a price cap set on natural gas used for power generation in Spain and Portugal, which elapsed on 31 December 2023.

13. If there was one emerging example of how businesses are engaging in renewable energy, what would that be? For example, purchasing green power from a supplier, direct corporate PPAs or use of assets like roofs to generate solar or wind?

Distributed solar, especially self-consumption, is becoming more and more attractive, and business models around the aggregation of excess production from many small power plants (forming virtual power plants) may become a reality in the future.

During the first semester of 2023 Portugal seen an increase of 419 MW in existing solar power compared to the end of 2022, while 81% (338 MW) under self-consumption mechanisms.

By the end of 2025, Portugal should have an additional 93 MW of power for renewable energy production in collective self-consumption projects or energy communities in residential, public administration or commercial and service buildings.

14. What are the significant barriers that impede both the renewables industry and businesses' access to renewable energy? For example, permitting, grid delays, credit worthiness of counterparties, restrictions on foreign investment.

Grid capacity is the main bottleneck of renewables industry. Permitting has also been challenging but several measures have been recently enacted aiming to allow for a more expeditious and less heavy permitting process, especially on the environmental assessments required.

Scarcity of network capacity and the time and cost of developing and licensing new power plants are probably the main issues restraining or delaying the development of new power plants in Portugal.

Other significant issues restrain the development of new projects:

- environmental restraints: it is common for renewable energy projects to affect environmentally sensitive areas, such as Natura Network 2000 ecological reserves or areas with protected tree species, and larger projects are subject to environmental assessment procedures;
- planning restraints: utility-scale photovoltaic plants, especially, cover a large area of land and municipal master plans and others may not allow, or foresee, the development of these projects; and
- land restraints: developing a renewable energy project requires securing all the land required for it, with no possibility of expropriation or constitution of administrative easements of land (except for certain interconnection lines).

A growing number of suppliers are in the business of off taking the energy generated by renewable energy projects, but the thresholds for bankability of projects in terms of creditworthiness often reduce the number of possible offtakers considered by banks to be creditworthy.

15. What are the key contracts you typically expect to see in a new-build renewable energy project?

We would expect to find the proper land rights and all required administrative licenses and authorizations in place, contractual package for securing the financing of the project, the power purchase agreement (PPA) or Contract-for-Difference (CFD), the interconnection agreement, the major supply agreements and the operations and maintenance agreement (O&M).

The Engineering Procurement and Constructions Agreement (EPC) should still be relevant and provide for proper warranties.

16. Are there any restrictions on the export of renewable energy, local content obligations or domestic supply obligations?

The National Electricity System manage[1] is responsible, at each moment through the national dispatch operation, for verifying the electricity system’s needs and deciding whether to import or export energy, taking into consideration the energy produced and injected into the National Electricity System.

Notwithstanding the foregoing, producers may also sell the energy they produce on organised markets or through bilateral contracts.

The Iberian Electricity Market, MIBEL, resulted from co-operation between the Portuguese and Spanish governments with the aim of promoting the integration of both countries’ electrical systems. This played a significant role in establishing an electricity market at the Iberian level but also at the European level, and contributing to the development of the internal energy market.

The operation of the wholesale market at any given time is determined by the mix of production structure, import capacity, the imperfect meshing of the grid, the inelasticity of demand and the system reserve margin.

In the spot electricity market, transactions are executed by the participation of agents on the daily and intraday market that aggregates the Spanish and Portuguese areas of MIBEL. Trading on the daily market is based on a daily auction, with settlement of energy at every hour of the following day.

There are various intraday sessions subsequent to the daily market auction in which agents can trade electrical power for the various hours of the day covered by that market. Trading is also done by auction.

OMIP is the operator of the Portuguese division of MIBEL and is responsible for the management of the derivatives trading market. On the OMIP trading platform, all features of the futures agreements are standardised. Therefore, when an agent opens a position, it only needs to choose the agreement it will trade, the relevant quantity and the price (except if it is a market offer). These contracts are marked to market each day.

The operations carried out by OMIP are registered in trading accounts and simultaneously registered in clearing accounts through which the financial settlement of the agreements is assured.

On its turn, the Iberian natural gas market, MIBGAS, offers its users the possibility of trading within-day, day-ahead, balance of month, and month-ahead products at the Iberian level. Yet, only recently, trading of natural gas through MIBGAS started with physical delivery in Portugal, in the Virtual Trading Point (VTP).

The Iberian Peninsula is isolated from an energy market perspective, with limited connection to the central European markets. Although legally permitted to trade with other countries, most of the international electricity trading is done with Spain.

Footnote(s):

[1] The global technical management of the National Electricity System, SEN, is the responsibility of the operator of the National Transmission Grid.

17. Has deployment of renewables been impacted in the last year by any non-country specific factors: For example, financing costs, supply chain or taxes or subsidies (like the US's Inflation Reduction Act)?

The supply chain has been severally impacted, as it were the construction and financing costs due to inflation and the increase of interest rates.

Finding a proper financial model for projects became one of the key challenges that developers face.

18. Could you provide a brief overview of the major projects that are currently happening in your jurisdiction?

Portugal has utility-scale projects with various renewable energy sources. The largest in terms of power are hydropower plant and wind, although biomass is also relevant and solar photovoltaic is developing quickly and is expected to achieve major growth in the upcoming years.

Portugal had a total installed capacity of 5.809 MW of wind power plants, which produced around 13.2GW in 2023. Usually, these power plants have different installed capacities, typically ranging between 10MW and 200MW.

Biomass power plants had a total installed capacity of 865MW in 2023, which produced around 3.5GW in 2023, and their individual installed capacity may reach 100MW, normally connected to other activities (industrial or similar).

Hydropower plants have a total installed capacity of around 8,8GW, divided into smaller (up to 10MW) or bigger (more than 10MW) plants. The larger hydropower plants recently commissioned include Baixo Sabor, Feiticeiro and Foz Tua. Iberdrola is building three hydropower plants – Gouvães, Alto Tâmega and Gaivões, with a total 1.2GW of installed capacity.

Finally, Portugal installed 1.23GW of new solar capacity last year, more than half of which was self-consumption. It was the best year ever for the growth of photovoltaic energy in the country. Up to 2030, solar installed capacity is expected to reach 9GW (7GW in utility-scale projects and 2G W in distributed generation).

The following project are worth mentioning:

1. Three Hydropower complex across three water reservoirs in northern Portugal, that will rely on 880 MW of pumped-hydro storage and is expected to become fully operational in 2024.
2. Europe’s largest photovoltaic project and the fifth largest in the world, located in the municipality of Santiago do Cacém, will have 1,200 MW of installed capacity and is expected to be commissioned in 2025;
3. One of the largest solar power plants in the country with an installed capacity of 431MW and an investment around 365 million euros, in the southern area of the Alqueva damn and which construction is expected to start late 2024;

4. Two hydrogen projects to be developed in Sines, which were selected by the European hydrogen bank's first auction alongside other 5 projects and among 132 submissions and that will be supported with around 720 million euros;

19. How confident are you that your jurisdiction can become a leader in newer areas like offshore wind or hydrogen?

We are confident that Portugal may become a leader in offshore wind or hydrogen.

Considering several national plans and strategies, among which the Industrial Strategy and Action Plan for Ocean Renewable Energy through the Council of Ministers Resolution no. 174/2017, the Portuguese Government has been very active during 2023, preparing the relevant territorial plans (e.g. public consultation of the Allocation Plan for Offshore Renewable Energies up to 13.12.2023) and carrying out the legal and technical studies.

On July 2023 of the working group composed by members of the most relevant public entities from energy sector, seaports, infrastructures and environment, delivered its final report comprising findings and recommendations, namely:

- Capacity of up to 3.5 GW in Viana do Castelo, Leixões and Figueira da Foz in a first phase (1, 05 and 2 GW respectively), subject to one or more competitive procedures.
- Two competitive models that can be implemented for the development of the offshore wind market in Portugal were identified: the so-called centralised model, which assumes the allocation of a remuneration support mechanism for the production; and the so-called decentralised model, which does not have such a mechanism associated.
- Network infrastructures and the offshore industrial sector shall be developed as to support the development of wind offshore projects.

Following such recommendations, the Government opened a period for expression of interest, in which around 50 promoters/interested parties expressed their interest as to develop offshore wind projects, including relevant players in the market such as Iberdrola, REPSOL, RWE, OceanWinds, Greenvolt BlueFloat and Equinor.

Following such phase, a dialogue phase with the promoters took place. The auction is expected to be launched in 2024, being the exact timing still to be defined, considering particularly the recent political change recently occurred.

The extent and content of the tender documents and the model to be approved will be disclosed during this year.

The Offshore wind faces many challenges and is yet on its inception phase, benefiting from the contributions of several stakeholders which hopefully will be considered by the Government on the design and launch of the competitive process for allocation of the capacity.

It will be of the essence to ensure the investment requirements are feasible, the locations where the capacity shall be installed are well defined, there is clarity on how the connection of the power generation centres to the electrical grid on land will be made and who will finance the infrastructure and reinforcement of the Grid to absorb these envisaged additional 10GW.

On its turn, Green Hydrogen can play a crucial role in the global energy transition, especially in sectors whose energy consumption cannot be directly electrified, such as aviation, maritime transport and some industries that require intensive thermal processes. However, implementation is progressing slowly, which could jeopardize this opportunity.

The Iberian Peninsula will be the European region with the greatest renewable electrical potential and for green hydrogen and at lower prices, because its complementarity between wind, air and soil is such that we can reach lower-level costs than other countries.

On the other hand, the port of Sines is set to become the hub for green hydrogen in the country, boasting electrolyzing capacity of 2.5 GW by 2030, and 265 MW in 2025. The ambitious goal set-out for offshore wind farms is also likely to further enhance and boost the investments in the port's infrastructures.

Part of the hydrogen produced will flow through the country's modern and extensive natural gas grid. On average, the 19,000 kilometres of pipelines are less than 15 years old, almost entirely in polyethylene, which is particularly well suited for hydrogen transport.

20. How are renewables projects commonly financed in your jurisdiction?

Project finance and junior debt or corporate equity instruments are commonly used to finance projects in our jurisdiction.

Among alternative means of financing and refinancing renewable projects, the issuance of green bounds and sustainability financing are worth mentioning and has been gaining track over the last recent years.

It is typical, but not mandatory, for third-party financing of renewable energy projects to be done under project finance schemes, by incorporating special purpose vehicles to own the project.

As a result of ring-fencing principles, this approach is necessary to create a barrier that segregates a portion of the company's assets from the rest and improves the bankability of the project.

Moreover, some sponsors turn to refinancing to operate projects, given that the risk of construction has already disappeared. This is especially relevant in situations where there is a feed-in tariff that allows lenders to have further certainty as to project income.

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