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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 and implements the policies and measures for an effective application of the guidelines contained in the Roadmap to Carbon Neutrality 2050 (RNC2050) and for the fulfilment of the defined targets.

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.

Between January 1 and April 30, 2023, 15,826 GWh of electricity were generated in Continental Portugal, from which 74.3 % came from renewable sources. In April 2023 renewable incorporation on electricity generation was 69.4 %. On the other hand, fossil thermic electroproduction centres represented 20.6 %.

In the insular regions, 823 GWh of electricity were generated in the Azorean Islands, from which 35,1 % came from renewable sources in 2022, while in the first semester of 2022, 893 GWh of electricity were generated in the Madeira Island Region, from which 33,0 % came from renewable sources.

A public free accessible database with relevant information about all power generation centers using renewable energy sources in Portugal, sponsored by APREN in collaboration with INEGI, is accessible through the following link:
http://e2p.inegi.up.pt/relatorios/Mapa_CEPs_e2p_2017.pdf

Portugal has several measures to drive the deployment of renewable electricity generation, including feed-in tariffs and a new system for allocating grid connection capacity that includes solar PV auctions. Since this new system was established in 2019, network capacity reserve titles have been granted to over 1.95 GW of renewable energy projects (primarily solar PV, along with

some wind and battery storage).

The government approved 1.16 GW of new hydropower capacity and major expansions of electricity infrastructure to support the integration of renewables and better interconnection with Spain. The government is also taking steps to increase the flexibility of the electricity system, including the deployment of smart grids and pilot projects for dynamic tariffs and demand response market participation.

This year, renewable energy projects should represent an upgrade in the total of new installed power of 2 gigawatts (GW). Solar will continue to dominate investments, but the production of electricity from wind will gain weight, with projects of around 200 megawatts (MW) planned. In addition, 2023 should be marked as the year in which the first green hydrogen production units will start operating, with the installation of at least 100 MW expected.

After the three auctions for solar – the last one held last year for floating power plants in reservoirs – the installation of solar power plants has grown by leaps and bounds. In the last year, installed photovoltaic power grew by 46% to 2.5 GW

Iberdrola currently received the environmental licensing from Portuguese Agency of the Environment (APA) for the construction of the largest solar photovoltaic power plant in Europe in Santiago do Cacém, with an electricity production capacity of 1.2 gigawatts.

Finerge has four wind projects under construction, with 84.2 MW of capacity, which will start operating in the first half of this year". In addition, in 2023 it will also start the construction of 15 projects: nine wind energy and six solar energy with completion expected between the end of 2023 and the beginning of 2024

EDP, on its turn, also foresees "the entry into operation of more than 200 MW of solar and wind power, through projects to over-equip current wind farms, the hybridization of wind farms, to which solar energy will be added, and also with the inauguration of the photovoltaic power plant at Cercal".

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. However, as these are projects that take time to build, entry into operation will take a few years. The first offshore wind farm in Portugal was developed by Windfloat Atlantic, a consortium comprising EDP, Engie, Repsol and Principle Power.

The Government has not yet revealed what capacity it intends to award in the first auction, to be launched this year, and which will allow expanding wind production at sea in Portugal, which for now has only one operational project.

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.

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. 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.

Portugal might be able to anticipate the goal of carbon neutrality to 2045.

The legal instruments in force on climate change include the above-mentioned PNEC 2030, RNC2050 and the National Hydrogen Plan (NH2P)

The feasibility of a cohesive transition and with the active participation of entities from different levels of territorial organization, from regional agents and closer to the citizen, shall be better ensured on the periodic updates of the RNC2050, incorporating, among others, the monitoring of the evolution of climate change, and relevant international and European policies, while deepening the targets at the level sectoral, regional and/or intermunicipal.

Currently a prior public consultation for the revision of the PNEC2030 is ongoing.

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, Iberdrola has an ongoing project to produce 1200 MW on 3 dams in river Tâmega and it has started building 86 MW of solar photovoltaic farms in Portugal.

In March 2022 GreenVolt formalized a strategic partnership with Infracore, becoming the holder of 50% of a set of photovoltaic solar projects in Portugal, totalling 243 MW of capacity, of which about 160 MW are in an advanced stage of development.

Greenvolt has under construction, in Portugal, the Tábua park, with around 48 MWp, and the Small Production Units (UPPs) of Figueira da Foz and Ródão, which total around 14 MWp, and 10 MWp under construction, which are part of the portfolio of around 200 MWp in partnership with Infracore.

In February 2022 oil and gas company Galp and Swedish battery manufacturer Northvolt have announced a 50/50 partnership to build Europe's largest lithium processing plant in Portugal, with a total investment of up to 700 million euros. The start of operations is forecasted to happen by year-end 2025 and the start of commercial operations in 2026

Dublin-based electrolyser maker Fusion Fuel Green Plc has joined project developer KEME Energy to equip with

its technology a 1.22-MW solar-to-hydrogen project in Sines. The project, will consist of 62 HEVO-Solar trackers that will generate an estimated 77 tonnes of green hydrogen per annum. The construction of the facility is expected to start soon.

Swiss renewables developer Edison Power Europe AG successfully connected its largest photovoltaic plant so far to the Portuguese electricity grid on December 30 2022, the 49 MW plant Mogadouro, and is pressing ahead at full speed with the development of the other four Portuguese projects with a total capacity of 150 MW

The Central Fotovoltaica Riccardo Totta, named after the father of the owner of the land on which it sits, is now Portugal's largest photovoltaic plant, producing 219 Megawatts of power. It was inaugurated in October 2021 and was developed by WELink energy/Solara4 in partnership with China Triumph International Engineering Company.

Windfloat Atlantic reached 78 GWh in its second year of operation (2022). The project, driven by EDP Renewables through the Windplus consortium formed by OW (50:50 joint-venture between EDPR and ENGIE), Repsol and Principle Power, was the world's first semi-submersible floating wind farm.

ACCIONA Energía has 166MW of renewable generation assets in Portugal, including wind and solar installations. The company's portfolio in Portugal includes 16 wind farms, as well as one of the largest photovoltaic plants in the Iberian Peninsula, the 46MWp Amareleja Solar Power Plant.

In 2020 Engie spent 2,2 billion euros to buy several dams operated by EDP on river Douro, with a generation capacity of 1.7 GW.

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, along with the Guarantees of Origin market, are the preferred options to business access renewable energy.

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.

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.

Finally, a Guarantees of Origin (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 cancellation of the GO.

GO's issued to generators receiving a feed-in tariff are transferred to DGEG and periodically bided on an 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)?

Renewable energy can be said to be the current star of the show, given its role at the heart of the energy transformation. Every system, from how we grow our food, transport goods, build our cities and power our lives, is in transition and so electrification has become the key driver of the energy industry.

However, the conflict in Ukraine, global supply shortages, and the COVID-19 pandemic have led to an evolving energy and food security crisis. Surging inflation and the resultant costs of living increases add further instability. As a response to the energy crisis, powering up the transition away from fossil fuels has never had quite so much momentum.

A vast number of players in the Portuguese financial sector, as well as in other sectors are proactively implementing ESG policies and are anticipating several requirements of the European Union legal regime on taxonomy for sustainable investment.

Most of the traditional energy intensive industries (cement and paper mills are a good examples), have added photovoltaic generation to their energy mix.

Several companies are including a carbon budget on their market disclosures. According to article 38 of Law 98/2021 (Climate Framework Law) companies must evaluate climate risk against the business model, capital structure and assets.

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. Currently there are two major initiatives that are being subject to public consultation, namely the PNEC revision and the competitive model for the allocation of 10 GW of

offshore wind capacity.

European and national strategies have been adjusting to current unprecedented 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 policy-makers 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 wide spread and business are increasing its awareness and prioritizing measures to reduce its carbon footprint.

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.

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 the next 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.

The next 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.

Therefore, aiming at accelerating the decarbonization of the economy, the Government commits itself to:

- Accelerate the implementation of the 2030 National Energy and Climate Plans and the 2050 Carbon Neutrality Roadmap, 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 auctions already presented, mobilizing up to €50 million per year from existing CO₂ revenues to support the decarbonization of the industry and the heavy passenger and goods transport sector;
- Increase solar energy production capacity by at least 2 gigawatts over the next two years, 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;
- Foster electricity storage generated from renewable sources;
- Achieve the planned interconnections;
- 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;
- Present a National Strategy for Biomethane, produced from biomass, wastewater or WWTP sludge;
- 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;
- Implement the Long-Term Strategy for Building Renovation, approved in 2021, which includes a roadmap with indicative measures and targets for 2030, 2040, and 2050, and the National Long-Term Strategy for Combating Energy Poverty 2021-2050, which aims to address energy poverty, protect vulnerable consumers, and actively integrate them into the energy and climate transition;
- 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.

Recent 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 law will require several new regulations and amendments to existing regulations, so as to fully implement it, most are expected to take place during 2023.

The Decree-Law also partially transposed Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.

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.

There are also several key regulation approved ERSE:

- Regulation on Access to Networks and Interconnections (Regulamento de Acesso às Redes e às Interligações)
- Regulation on Trade Relations (Regulamento de Relações Comerciais)
- Tariff Regulation (Regulamento Tarifário)
- Regulation on Quality of Service (Regulamento da Qualidade de Serviço)
- Regulation on Network Operations (Regulamento de Operação das Redes)

A public consultation on the Regulatory Reformulation of the Electricity Sector was recently closed and its enactment is expected to take place soon, with extension to the Gas and Piped LPG Sectors and approval of the Regulation on the Misappropriation of

Energy of regulations, covering, inter alia, the revision of the above-mentioned key regulation plus the following:

- Regulation of Smart Grid Electric Energy Distribution Services (Regulamento dos Serviços das Redes Inteligentes de Distribuição de Energia Elétrica);
- Self-Consumption Regulation (Regulamento do Autoconsumo);

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 recently approved 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 standpoint, it is relevant to note that the energy sector is one of the eligible sector for two tax benefits programs:

- Investment Support Tax Regime ("RFAl"):

Under this regime, companies may deduct a percentage of eligible investments (25% of the first €15 mio of investment and 10% of the exceeding amount) and reducing the amount of Corporate Income Tax ("CIT") payable in a given year, up to 50% of the CIT due.

The relevant companies may also benefit from an exemption of Real Estate Transfer Tax (due on the acquisition of real estate) and of Real Estate Tax (due annually by the owner of the real estate).

- Contractual Tax Benefits for the productive investment:

Large projects, notably with an investment of at least €3.000.000,00 may also eligible for contractual tax

benefits. The benefits are settled by way of contract with the Government and also consist mostly in CIT, real estate and stamp duty exemptions.

The tax benefits are granted for fixed period of time (maximum 10 years from the conclusion of the investment project). This regime is not available since the end of 2021, but is expected to be reintroduced still in 2022. In fact this regime is subject to an annual renewal. At the end of 2021, the Parliament was dissolved (the annual budget proposed by the Government was not approved) followed by general elections in February. The Government and the Parliament is expected to take office in late March and afterwards, the legislative process shall resume.

In addition to these tax benefits focused on energy producers, 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.

One is typically selling electricity at a fixed price, and another a payment to the system for the electricity for the capacity awarded or electricity generated. The recent auction for the network capacity released by the deactivation of the Pego power plant differs from the previous procedures because it uses different criteria, linked not so much to the electricity price but more to the benefits of the projects to the electricity system and wider merits of the projects.

12. Has your Government had 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 until 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. The year of 2022 registered 0,7 TWh in self-consumption schemes.

In financing of renewable energy projects, issuance of green bonds and sustainability financing are expected to become more common.

Concerns regarding the definition and application of

criteria to avoid greenwashing already took place.

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?

Depending on the project nature and contractual model, we expect to find the 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), while the Engineering Procurement and Construction 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 manager¹ 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 ("SEN").

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 a energy market perspective, with limited connection to the central European markets. Although legally permitted to trade with other countries, the gross majority of international electricity trading is done with Spain.

17. Has deployment of renewables been impacted in the last year by any non-country specific factors: For example, financing costs, supply chain or Covid 19?

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 following years.

Portugal had a total installed capacity of 5,671MW of wind power plants in 2022. 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 2022, 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 7,463MW, 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 – expected to be completed this year of 2023.

Finally, solar power plants had a total installed capacity of 2,591MW in 2021 and, up to 2030, we expect solar installed capacity to reach 9,000MW (7,000MW in utility-scale projects and 2,000MW in distributed generation).

The following projects are worth mentioning:

1. Hydropower complex across three water reservoirs in northern Portugal. The project will rely on 880 MW of pumped-hydro storage and is expected to become fully operational in 2024.
2. In 2018, the government approved the construction of 1.16 GW of new hydropower capacity, of which 0.88 GW will be pumped hydro (commissioning of this hydropower capacity in 2023).
3. Portuguese energy company Galp is targeting a final investment decision on its planned 100-MW Sines hydrogen production plant in the first semester of 2023.
4. In 2019, annual auctions for large-scale solar PV projects were established. The first two PV auctions awarded network capacity to 1.85 GW of PV projects, including 0.5 GW of projects that will deploy at least 100 megawatts (MW) of battery storage.
5. Auction for 262-megawatt (MW) floating solar photovoltaic (PV) capacity awarded in 2022 and to be installed at seven dams across the country. The project is expected to be fully operational by 2023.
6. Portugal will start producing green hydrogen soon and already has private investment worth around 10 billion euros lined up for eight projects that are expected to move forward.

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.

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.

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

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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