MACEDO VITORINO

DECEMBER 2021 – PORTUGUESE REGULATIONS ON

GREEN HYDROGEN

MACEDO VITORINO

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THE PORTUGUESE ENERGY TRANSITION GOALS

The National Hydrogen Strategy (**EN-H2**), of 14 August 2020, sets commitment to ensure the neutrality of Portugal's carbon emissions by the end of 2050:

- Greenhouse gas (**GHG**) emissions to be reduced by 85% to 90% in relation to 2005 levels.
- Carbon sequestration to reach levels of 9 to 13 million tons of CO2 in 2050.
- A 55% reduction in GHG emissions and a 47% share of renewable energy in gross final energy consumption is expected to be achieved by 2030.

All this is aligned with the 2050 Carbon Neutral Roadmap (**RNC2050**) and the 2030 National Energy and Climate Plan (**PNEC 2030**).

Green hydrogen arises as an efficient solution to promote the energy transition in various sectors, particularly with the decarbonizing of transport and industrial sectors while strengthening the national economy and promote scientific development. It is an energy carrier with high energy density, which makes it the ideal solution for energy-intensive industrial processes, for the storage of energy produced through renewable sources and for the emergence of other renewable based fuels.

To achieve this transition, EN-H2 assumes as main goals for 2030:

- 5% green hydrogen in final energy consumption, road transport and industry;
- 15% green hydrogen injected into natural gas networks;
- 50 to 100 hydrogen refuelling stations; and
- Between 2 and 2.5 GW of installed production capacity.

Although EN-H2 sets out the intent to carry out a large production of green hydrogen in Sines with a capacity of 1 GW by 2030, support measures for decentralized hydrogen production projects of different scales, spread throughout the Portuguese territory are also expected.

GREEN H2 PRODUCTION AND USAGES IN THE EN-H2

Although hydrogen exists in great abundance, it almost always appears in combination with other chemical elements, and their combination constitutes other elements, such as water. As a result, the production of hydrogen requires the use of processes to separate it from the compounds in which it appears.

Hydrogen production can be accomplished using a wide variety of technologies, which always require energy in the form of heat, light or electricity. One of this technologies is water electrolysis, which is a simple process of breaking down water into its two components (splitting the hydrogen and oxygen atoms) using electric power.

For the purposes of EN-H2, green hydrogen is defined as hydrogen produced exclusively from processes using energy from renewable sources and whose GHG emissions throughout its production life cycle are zero or very close to zero.

EN-H2 foresees that Portugal can benefit from the following uses of green hydrogen:

- Fuel for various types of transport, with particular potential for heavy road transport, maritime or even rail and air transport through the use of fuel cells (which can store hydrogen and use it to produce electricity in a controlled way);
- Replacing natural gas as a fuel in the industrial sector, which contributes to reducing GHG emissions;
- Decarbonize and replace fuel production with synthetic fuels produced from mixtures of hydrogen and carbon dioxide;
- Conversion of excess renewable electricity into hydrogen, stored and then reconverted back into electricity using fuel cells; or
- Injected into the natural gas network or by converting hydrogen into synthetic methane to be used directly by residential and industrial consumers.

STARTING WITH THE PRIOR REGISTRATION

Production of hydrogen through renewable origin is ruled by Decree-Law No. 62/2020, of 28 August (the "**National Gas Law**") and it is only accessible to legal persons that display relevant technical, financial and management capacity.

Performance of green hydrogen production activity is subject to prior registration at the Directorate of Energy and Geology (*Direção Geral de Energia e Geologia* – **DGEG**) to start construction and operating of the generating facilities.

Promotors must submit their requests to DGEG through e.Portugal with several documents, including: (i) proof of the land rights for the project, (ii) execution project of the generating facility, (iii) project plan and timeline deadline for entry into operation, and (iv) evidence of the technical, economic and financial capacity and experience of the promoter to ensure the development of the project.

The file is then forwarded to the licensing platform of the Portuguese Environment Agency (**APA**) (**SILAIMB**) where an environmental assessment will be conducted.

After registration application, the TSO, in Portugal REN GASODUTOS, SA, or the DSOs (Beiragás, Lisboagás, Lusitaniagás, RENPortgás, Setgás and Tagusgás each one with its exclusive distribution area) (as applicable), on a first come first served basis depending on the grid capacity proposed conditions, accepts or not the project as proposed by the promoter and sets the conditions for its connection to the grid.

DGEG shall confirm the prior registration (subject to payment of a €600 fee) within 30 days as from grid operator's decision.

After the prior registration, the promoter must start operating the hydrogen plant within a maximum period of two years subject to an additional extension of one year when its insufficiency is due to unavoidable reasons not attributable to the promoter.

The promoter has then the right to inject the hydrogen into the grid and to sell the plant's production: (i) in organized market or through bilateral contracting, at a price previously agreed between the parties, or (ii) through the last resort supplier against payment of fixed remuneration.

ENVIRONMENTAL REQUIREMENTS

Hydrogen plants are subject not only to a prior registration, but they are also subject to environmental regulations. Hence, H2 plants must go through:

- **Environmental Impact Assessment**: According to Decree-Law no. 151-B/2013, of 31 October, should be made (i) directly, if the project reaches the thresholds set out in Annexes I and II; or (ii) indirectly, If the project does not meet the thresholds of Annexes I or II but is likely to have significant effects on the environment, according to Annex III.

- **Major Accident Prevention**: As hydrogen is a dangerous substance, whenever in quantities of 5 tons and 50 tons or more, producers are subject to a set of obligations, namely the communication and evaluation of compatibility of location where the production plant will be installed, as well as in the definition of a Policy for the prevention of major accidents.

- **Integrated Pollution Prevention and Control Regime**: To produce hydrogen on an industrial scale, by chemical or biological transformation, whose commercialization is in bulk and/or by injection into the gas or transport networks, is necessary an environmental licensing permit (**TUA**) issued by APA, which must be requested by operators through the SILIAMB Platform.

- **European Emissions Trading Framework:** green hydrogen projects that are based on the electrolysis of water using renewable energy are not covered by this regime, but other types of production may be, namely in case production is based on fuel combustion with thermal input exceeding 20 MW and that generate greenhouse gas emissions being subject to obtain greenhouse gas permit to be issued by APA and to register in the Portuguese Emission Allowances Registry.

- **Air Emissions Permit:** If there are sources of air pollution associated with the production process, obtaining an Emission Permit to be issued by APA or by competent Regional Coordination and Development Commission (**CCDR**) is mandatory.

- **Water Resources Use Regime**: Water abstraction and wastewater discharge for hydrogen production are subject to obtain a Water Use Title (**TURH**). The use of sea water is subject to obtaining a title for occupation of the maritime space (**TUPEM**).

CONNECTING TO THE GRID

After the prior registration, promotors shall enter into an agreement with the relevant grid operator setting forth the technical and commercial conditions for connecting the hydrogen plant to the grid.

Promoters will have to bear the costs of the construction of the necessary connection infrastructures to the public gas grid under the conditions established in the agreement executed with the grid operator, including the costs related to the occupation of the land which may be necessary for the installation of said infrastructures. In addition, promoter is also subject to the payment of a grid contribution fee, which is calculated pursuant to a formula published by the Portuguese Energy Services Regulator (**ERSE**).

However, in case a connection branch becomes used by a new producer, the promoters that have borne the costs of its construction shall be reimbursed by that producer, under terms defined by ERSE.

For the execution of the infrastructures necessary for connection and injection into the grid, promoters may constitute easements and request expropriation for public utility of the necessary real estate under the same terms and conditions as the concessionaires of the public gas grid.

Investments in the grid (namely to accommodate the injection of hydrogen) are made by the relevant transmission and distribution operators, according to their development and investment plans, which, in general terms, end up being supported by the consumers through network access tariffs.

Connection infrastructures shall become part of the grid and integrated in the concession of the relevant grid operator after construction and as soon as they are in technical operating condition.

The grid operator may request the promoter to provide a guarantee, valid for a period of two years, corresponding to a maximum of 10% of the value of the connection elements in order to make up for any construction deficiencies.

Prior to the start of operation of the hydrogen plant, a contract for the use of the grid infrastructures shall be entered into between the promotor and the relevant grid operator for the purpose to establish the conditions related to the use of the grid and interconnections, as well as the technical conditions for injection and the terms under which injection may be stopped or limited.

CONSTRUCTION PERMIT

The construction of a hydrogen plant requires a construction license to build the plant and related infrastructure. The promotor may obtain prior information about the feasibility of carrying out the construction of the project, as well as on the respective legal or regulatory conditions, by submitting in the municipality of the plant's location a *pedido de informação prévia* ("**PIP**").

A positive PIP binds the municipality for a period of one year to the issuance of the construction license, in the exact terms in which the PIP was granted.

The request for a construction permit can be submitted online (at the municipalities' website).

Within 45 days from the date of receipt of the last of the opinions the municipality must obtain from other authorities, the municipality will grant a construction license and issue an *alvará de construcção (*a construction permit certificate*)* at the request of the promotor.

Issuing of the construction permit is subject to the provision of a deposit by the promoter to the Municipality as well as a valid insurance policy covering work accidents.

The construction of the hydrogen plant must start within one year after the issuing of the permit, under penalty of expiration of the relevant construction license.

After completion of the construction works, the promoter needs a license of use for the plant issued again by the Municipality following submission of (i) the final blueprints, and (ii) a term of responsibility subscribed by the director of the works, in which they declare that the work is completed and that it has been executed in accordance with the architectural and specialty projects, as well as with the legal and regulatory rules that apply to it.

The license of use is granted within 10 days of receipt of the application, unless a survey to the work is decided by the President of the Municipality.

SUPPORT MECHANISMS

EN-H2 provides for serval support mechanisms to encourage new investments in green hydrogen. These are still subject to the publication of specific regulations:

- The injection of hydrogen into natural gas networks may benefit from a partial or total exemption from network access tariffs for an initial period.
- A public allowance to hydrogen production, through a premium that covers the difference between the production price of green hydrogen and the price of natural gas in the Iberian natural gas market (MIBGAS).
- Fiscal mechanisms to encourage replacement of natural gas by green hydrogen, adjusting the relative prices between the two alternatives, penalizing natural gas and reducing the cost of hydrogen. Tax benefits and positive discriminations in applicable taxes shall be established based on the advantages of green hydrogen.

Renewable gases are covered by the system of guarantees of origin (**GO**), granting producers access to the GO market.

The Recovery and Resilience Plan (**PRR)** includes a first call for 62 million euros launched for projects that aim to produce renewable gases for self-consumption and/or injection into the grid. Projects for developing and testing new technologies, or tested technologies that are not sufficiently disseminated in Portugal, are eligible.

The program applies to all public or private companies that: (i) requested prior registration to produce renewable gases; and (ii) obtained a prior assessment from DGEG that it is an eligible operation. Funding per beneficiary and per project will have a maximum amount of support of 5 million Euros, although this may rise to 10 million Euros if projects cover more elements of the value chain (i.e. that include the integration of production, distribution and the final consumer). The maximum co-financing rate is 100% of the total expenditure considered eligible.

As European support instruments, we highlight (i) Horizon Europe: which aims to finance projects linked to the transition to a low-carbon economy, with a budget of €5 billion; (ii) the Innovation Fund: which focuses on low-carbon projects in carbon-intensive industries; and (iii) the InnovFin Energy Demonstration Projects: which is designed to provide loans, typically between €7.5 and €75 million, for innovative renewable energy projects.

THE MARKET REACTION

There are currently 37 PRR approved projects involving public and private companies, universities, municipality organizations and other institutions, related to the production of green hydrogen, which include, namely the following players: The Navigator Company, Altri, Bondalti Chemicals, Dourogás, Turbogás, Tejo Energia, Prio, CaetanoBus, and Grupo Águas de Portugal.

EDP plans to install about 250 MW of electrolysers over the next four years, which will represent an additional investment in 0.5 to 1 GW of new renewable capacity in green hydrogen production.

The company Fusion Welcome announced a fusion fuel production project, aiming to achieve a production capacity of 27,000 tons of green hydrogen per year. The consortium formed by AkuoEnergy and Solarbelt has also received approval to build a hydrogen jet fuel plant.

"Green Pipeline Project" in Seixal is the first project in Portugal that will inject green hydrogen into the gas grid, targeting 80 residential, commercial, and industrial customers who, as of January 2022, will start receiving a mixture of natural gas and hydrogen.

The mega consortium "H2 Sines“ has already received a first permission from Brussels to move forward with the production of green hydrogen. The next step is reaching an agreement with the European Commission regarding funding for this project. This project aims to produce green hydrogen using an electrolyzer with a capacity of 10 MW.

This technology already exists in Évora and Benavente and is expected to be extended to more regions of Portugal during the course of 2022 to produce green hydrogen through photovoltaic plants, which capture and concentrate solar radiation and then perform electrolysis to produce green hydrogen with high efficiency and low cost.

More recently the European Clean Hydrogen Alliance published a list of projects that European industry is committed to creating the European hydrogen economy at a large scale. With more than 750 projects, the list includes projects ranging from clean hydrogen production (446) to its use in industry (172), mobility (240), energy (143), and buildings (77). Portugal appears with 23 projects listed in the northern region, 67 in the center, 23 in the Lisbon Metropolitan Area and 18 in the Alentejo. The aim of the alliance is to facilitate investments in clean hydrogen by promoting sustainable projects and contact with investors being its membership open to all entities with activities in the renewable or low-carbon hydrogen.

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WHO WE ARE &WHAT WE DO

ABOUT US

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