



PROJECTS AND ENERGY

Hydrogen: National Strategy and guarantees of origin

Of the Council of Ministers Resolution no. 63/2020, which approved the National Hydrogen Strategy, was published on 14 August 2020.

Also, on 17 August 2020, Decree-Law no. 60/2020 was published, which, following the National Hydrogen Strategy, establishes the mechanism for issuing guarantees of origin for low carbon gases and for gases of renewable origin.

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1. National Hydrogen Strategy

Following our [informative note](#) about the version of the National Hydrogen Strategy (henceforth "EN-H₂") subject to public consultation, the final version of EN-H₂ was recently approved. This informative note is intended to convey the main novelties and aspects of the final version of the strategy.

The final version of the Strategy maintains the focus on green hydrogen - produced through the electrolysis of water using renewable energies – as a fundamental vector for the decarbonization of the economy, particularly in sectors where electrification is unfeasible or excessively costly.

It is crucial that Portugal, according to the Strategy, present particularly competitive conditions to produce green hydrogen, depending on its location and conditions of renewable energy generation at reduced prices.

Phases

EN-H₂ sets out three phases for the development of the hydrogen industry in Portugal:

- The first, to take place between 2020 and 2023, aims to develop the regulatory framework necessary for the implementation of the first projects of variable scale and in various sectors;
- The second, to be carried out between 2024 and 2030, will be geared towards the consolidation of the national framework, the strengthening of national competences in the sector, as well as the roll-out of projects at national level;
- The third, to take place between 2030 and 2050, will seek to achieve full development of the national hydrogen market, including export and internationalisation dimensions.

The Strategy defines the following measures and actions to be taken in each phase:

Stages of implementation of EN-H₂

PHASE 1 (2020-2023)	PHASE 2 (2024-2030)	PHASE 3 (2030-2050)
Preparation and approval of the legislative and normative framework about the various components of the H ₂ value chain.	National-scale implementation of decentralized projects of variable scale in the various sectors and components of the H ₂ value chain.	Consolidation of H ₂ as a vector for decarbonisation, wealth generator and job creation in Portugal.
Study and implementation of support mechanisms for investment, production and industrialisation around H ₂ .	Implementation and completion of the Sines industrial project.	Beginning of the phase-out of support for H ₂ production.
Implementation of decentralized small-to-medium scale projects in various sectors (industry, transport) and components of the H ₂ value chain.	Strengthening and reviewing (where applicable) the legislative and regulatory framework around the various components of the H ₂ value chain.	Review of EN-H ₂ .
Preparation of training and professional offer in the field of H ₂ .	Reinforcement of support for H ₂ projects based on EU funds.	
Encouragement of research and development.	Strengthening of national industrialisation capacity in the various components of the value chain.	
Consolidation and start of implementation of the Sines industrial project and submission of the IPCEI application.	Revision of EN-H ₂ .	

Source: Figure 26 of the [final version of EN-H₂](#)

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Targets

Ambitious targets are set for the development of the hydrogen sector in Portugal, in its numerous possible uses. For the 2030 horizon, the targets set for the incorporation of green hydrogen are the following:

- 10 to 15% injection into natural gas networks;
- 2% to 5% energy consumption in industry;
- 1% to 5% in the energy consumption of road transport;
- 3% to 5% energy consumption in domestic maritime transport;
- 1.5% to 2% in final energy consumption¹.

In terms of hydrogen production and distribution facilities, the Strategy aims to ensure that by 2030 the following capacity is developed:

- 50 to 100 filling stations;
- 2 to 2.5 GW of capacity in electrolyzers.

Concerning investment figures and public support (of European and national origin), ambitious forecasts for 2030 are defined:

- 7,000 to 9,000 million euros of investment in new projects (in industry, transport, energy, research and development);
- 400 to 450 million euros of investment support through European funds (PT2020, PT2030);
- 500 to 550 million euros of production support.

Depending on the achievement of these targets, the following benefits are estimated for the development of the hydrogen sector in the decade 2020-2030:

- 380 to 740 million euros of reduction in natural gas imports;
- 180 million euros of reduction in ammonia imports;
- 8,500 to 12,000 new jobs;
- 6 to 8 Mt CO₂ emissions reduction;
- 1% consumption of treated wastewater.

Main initiatives

The main initiatives to be undertaken in order to promote the introduction of green hydrogen are the following:

- Creating a legal and regulatory framework to cover the development of the several strands of the hydrogen value chain, including the licensing of its production and the possibility of its injection in the natural gas networks;

¹ Although this is the defined goal, the body of EN-H₂ presents, in a discrepant way, a 5% target of penetration in the final energy consumption.

- Implementation of a support mechanism to produce green hydrogen, which will be referred to below;
- Establishment of mechanisms to support investment in hydrogen projects.

The intention to implement a national hydrogen alliance is also foreseen, *i.e.* a space for debate on the energy sector, specifically on hydrogen, involving the main players involved in the sector.

Main projects – the Sines project

The strategy defined involves combining large-scale centralised projects (*e.g.* the Sines project) with decentralised hydrogen production projects, as well as projects aimed at decarbonising the transport and industry sectors.

With regard to large-scale centralised projects, the focus remains on promoting a large green hydrogen production project in Sines, positioning the port of Sines as a green hydrogen hub.

The Strategy sets the goal that the green hydrogen production plant to be established in Sines will have a total capacity in electrolysers of at least 1 GW by 2030, and will be fed from renewable energy, namely solar and wind.

The green hydrogen generated may be injected into the natural gas networks, distributed by tanker trucks or, at a later stage, exported via the Sines terminal.

It is preliminarily estimated that the total investment may exceed 1.5 billion euros and will be developed by a consortium comprising Portuguese and Dutch companies.

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The recognition of the Sines project as an Important Project of Common European Interest (IPCEI) is seen as a fundamental piece in obtaining financing for the Sines project. Following Order no. 6403-A/2020, through which the Government opened the period for the expression of interest for the Sines hydrogen project, the importance of this application is reinforced in order to promote this projec.

Financing of green hydrogen projects

The final version of EN-H₂ also presents novelties in the implementation of financing mechanisms for the energy transition focused on hydrogen.

In line with the document submitted for public consultation, the Strategy starts by listing the various European instruments under which hydrogen projects can be funded, which include the Recovery and Resilience Facility, the REACT-EU mechanism, the Just Transition Fund, the Invest-EU mechanism and the Horizon Europe mechanism, in addition to the Connecting Europe Facility and the Innovation Fund.

In terms of nationally implemented green hydrogen support mechanisms, the following should be highlighted:

o **Support to green hydrogen production**

A support mechanism to produce green hydrogen is considered to cover the difference between the production price of green hydrogen and the price of natural gas on the Iberian market (MIBGAS).

The support will consist of a variable premium on the price of natural gas to match the price of green hydrogen so that the introduction of green hydrogen is not reflected in the prices to be paid by consumers.

A mechanism for periodic adjustment of support, such as a regressive fixed rate or a variable rate indexed to certain parameters, may be envisaged. The terms of the support mechanism will be further studied in detail until the end of 2020.

This support will be allocated through competitive auctions open to all producers of renewable gases, and it is not entirely clear whether only those who want to inject hydrogen into natural gas networks will be able to participate.

It is expected that auctions will be launched on an annual or bi-annual basis, in line with the targets for incorporating hydrogen into natural gas networks, as follows:

Therefore, the total amount of support for production up to 2030 is expected to have a cap of between 500 and 550 million euros from the Environmental Fund (an average of about 50 million/year), which corresponds to the target of incorporating 15% hydrogen into gas networks.

According to EN-H₂, the implementation of the auction mechanism should consider a set of criteria aimed at ensuring competition to lower the price of hydrogen, as well as an effective implementation of projects in line with the objectives of this Strategy.

As an example, the criteria adopted should consider technical skills and capabilities, a proven track record in implementing projects of this nature, the active contribution of projects for creating value and employment and the development of knowledge in Portugal.

In terms of methodology, an adaptation of the methods applied to solar auctions is planned, namely through the allocation of quantities by lots and limiting the maximum capacity quota that a single bidder may win.

Currently, there is no specific date for the first auction, but it is believed that it can be held in early 2021.

Estimates for annual auctions for the injection of green hydrogen into gas networks

	AUCTION 1 2021	AUCTION 2 2021	AUCTION 3 2021	AUCTION 4 2021	AUCTION 5 2021	AUCTION 6 2021	AUCTION 7 2021	AUCTION 8 2021	AUCTION 9 2021	AUCTION 10 2021	TOTAL 2021 - 2030
Qta. H ₂ (Kt)	0.5	2	2.5	7.5	12.5	5-10	5-10	10-15	10-12.5	10-12.5	76
H ₂ in the network	0.1%	0.5%	1%	2.5%	5%	6%-7%	7%-9%	10%-11%	12.5%-13%	15%	15%
Funds (M€)	1.3	5	5.1	15.2	24.9	7.4-14.8	7.2-14.4	13.9-20.1	9.6-12	9.1-11.4	500-550

Source: Table 14 of the [final version of EN-H₂](#)



"The total amount of support for production up to 2030 is expected to have a cap of between 500 and 550 million euros from the Environmental Fund, which corresponds to the target of incorporating 15% hydrogen into gas networks."

○ **Investment support**

It is expected that during 2020, and in the framework of the Partnership Agreement – Portugal 2020, a Notice will be issued under the Operational Programme Sustainability and Efficiency in the Use of Resources (POSEUR) to support renewable energy projects, including the hydrogen component, with an amount of around 40 million euros.

For the 2021-2027 period, within the corresponding multi-annual financial framework, a sum of 13.5 billion euros is expected to be allocated to the climate action component, which is expected to be able to finance projects for the production, distribution and consumption of renewable gases, including hydrogen.

On the other hand, the intention is to use the Banco Português do Fomento as a green bank for the purpose of providing financial capacity and speeding up the several existing sources of funding dedicated to investing in carbon neutrality and circular economy projects.

○ **Other support mechanisms**

Other support mechanisms are also envisaged, such as the possibility of introducing a total or partial exemption from the payment of access prices for the part corresponding to the injection of hydrogen into the transmission and distribution networks of natural gas, without prejudice to the prior need to assess its impact on the financial balance of the system.

In terms of taxation, the plan is to adopt tax mechanisms to encourage greater substitution of natural gas by green hydrogen as part of green tax measures.

Green hydrogen will also benefit from the issue of guarantees of origin and the possibility of market participation in system services.

Differently, in the final version of EN-H₂, the reference to the support mechanism for replacing feed-in prices - which corresponded to the possibility of converting existing and operational renewable electricity production assets and selling electricity to the CUR for green hydrogen production – was eliminated.

2. Guarantees of origin for low carbon gases and gases of renewable origin

Decree-Law no. 60/2020, of 17 August, adapts the existing system for issuing guarantees of origin of electricity from renewable sources to cover low-carbon and renewable gases as well.

According to the new regime, producers of low-carbon gases and gases of renewable origin will be able to request EEGO to issue the guarantees of origin relating to the gases they produce.

The tasks of the issuer (EEGO) of guarantees of origin already performed by REN – Rede Eléctrica Nacional. S.A., concessionaire of the National Electricity Transport Network, are extended to the renewable and low carbon gases sector, except in the Autonomous Regions, where the tasks of EEGO are to be developed by the regional concessionaires.

The guarantees of origin will allow the producer of renewable gases to demonstrate their origin to the respective purchaser, under the same terms as the guarantees of origin already issued for renewable electricity and high efficiency cogeneration.

In contrast to electricity, there are no restrictions on the issue of guarantees of origin for producers of renewable gases that will benefit from production support.

It should be stressed that, under the new article 14 (1), there is an obligation for all producers who have requested guarantees of origin to contribute to the reliability of the system and, to this end, they must install systems for monitoring and controlling the characteristics and properties of the gases to allow and ensure the certification of the origin of the energy produced (article 14 (4)).

Regarding the content of the guarantees of origin, the following mentions shall be included in addition to the generic references required for the guarantees of origin also traded in the electricity sector:

- o The raw material used to produce the gases;
- o The process or technology used in the production of the gases;

"Producers of low-carbon gases and gases of renewable origin will be able to request EEGO to issue the guarantees of origin relating to the gases they produce."

- o The CO₂ emissions associated with the production of the gases;
- o The avoided CO₂ emissions per kilogram of gases produced, when compared to production from fossil fuels without mitigation of CO₂ emissions, according to the methodology to be established by the DGEG, after hearing the Portuguese Environment Agency, I. P. (APA, I. P.);
- o Complementary information that may be established by order of the Director General of Energy and Geology, after hearing specialized entities of the National Scientific and Technological System (SCTN), in particular the National Laboratory of Energy and Geology, I. P. (LNEG, I.P.).

Lastly, administrative offences are created for the breach of the legal provisions on guarantees of origin, including for breach of the obligation to request guarantees of origin regarding energy produced. ■