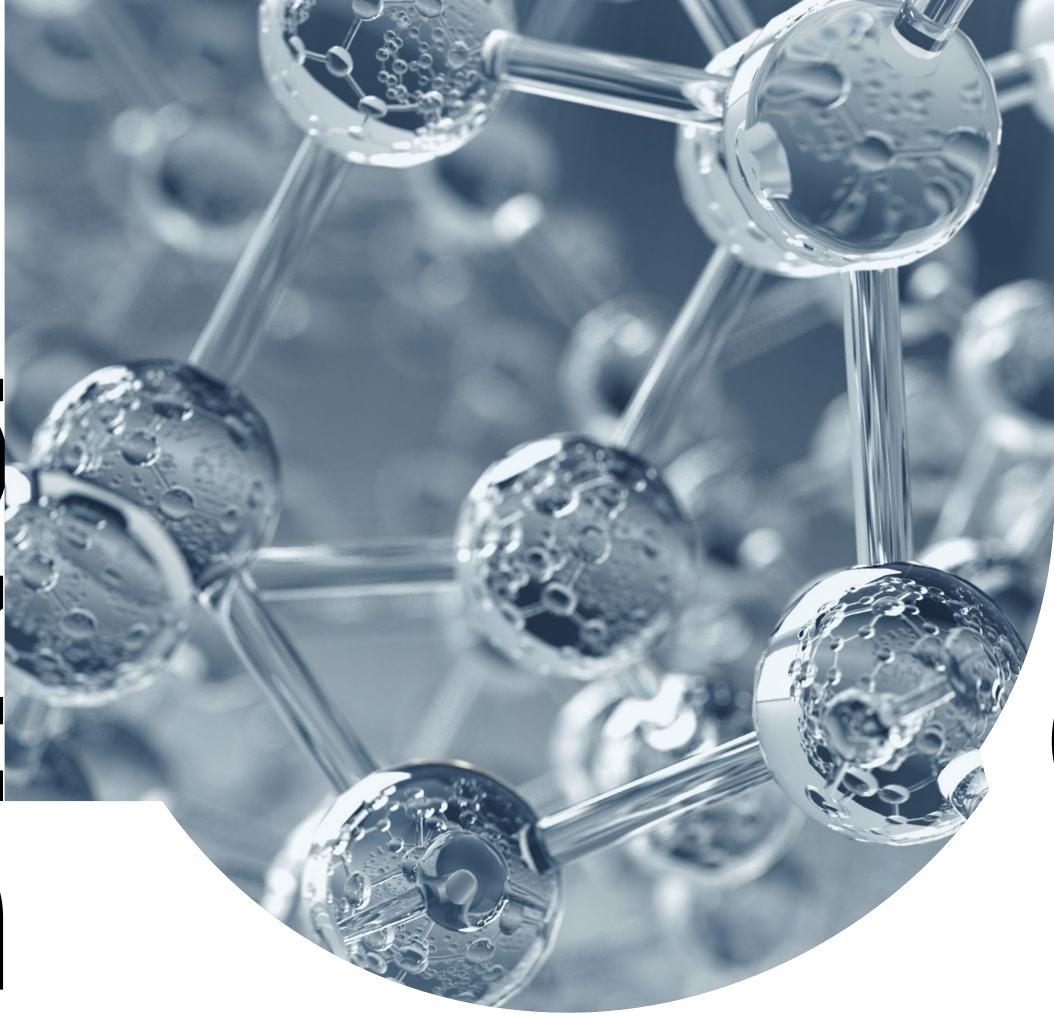
TRENDING TOPIC

JUN. 20



PROJECTS AND ENERGY

National hydrogen strategy

The National Hydrogen Strategy (EN-H_2) was approved by the Council of Ministers on 21 May 2020 and this document is available for public consultation from 22 May until 6 July 2020. The purpose of this consultation is to have a period of listening to society and of close dialogue with the main players in the sector. The overall goal is to consolidate the main objectives of EN-H_2, particularly with regard to the targets to incorporate hydrogen into the various segments of the economy.

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The approval of EN-H_2 comes about in the context of the objectives of decarbonisation of the economy and of energy transition that have been assumed by the Portuguese Government. The main objective of EN-H_2 is the gradual introduction of hydrogen into the energy sector and other sectors of the economy. Therefore, the measures now proposed are intended to boost the production, storage and consumption of hydrogen.

In this context, the recent Order 6403-A/2020 was published by the Government on 17 June 2020. In the order, the Government decided to open up a period, until 17 July 2020, for Portuguese or European companies or other bodies to express an interest in participating in the future Important Project of Common European Interest (IPCEI) on hydrogen.

As this is a new and complex topic, this informative note is intended to summarise the main issues involved in the production and value chain of green hydrogen and in EN-H_2.

To cut a long story short: what is (green) hydrogen and how is it produced?

Basic chemistry tells us that hydrogen is the simplest atom to be found in nature. It is also the most common chemical element in the universe and one of the most common on earth.

It is an element which, at room temperature, appears in a gaseous state and usually in the form of two hydrogen atoms. This why, as a rule, it is designated as H_2.

> **"The main objective of EN-H_2 is the gradual introduction of hydrogen into the energy sector and other sectors of the economy."**

However, although it exists on earth in great abundance, hydrogen almost always appears in combination with other chemical elements, such as oxygen or carbon. It is thus one of the components of water or methane.

As a result, the production of hydrogen requires the use of processes to separate it from the compounds in which it appears. These include water electrolysis and methane reforming, both of which consume a significant amount of energy.

Over time, the use of colour coding to categorise hydrogen has become widespread, depending on the form of its production. The colour coding is:

- **Green hydrogen:** the hydrogen produced by water electrolysis using exclusively renewable energies
- **Blue hydrogen:** hydrogen produced from methane reforming with the capture and storage of the carbon produced
- **Grey hydrogen:** hydrogen produced from methane reforming without carbon capture and storage
- **Brown hydrogen:** hydrogen produced from coal gasification.

Currently, most of the hydrogen produced is grey or brown hydrogen, in other words, it derives from polluting processes.

However, the main focus of EN-H_2 is to create a green hydrogen production industry that produces hydrogen from renewable energy sources.

Green hydrogen is produced by water electrolysis, which is a simple process of decomposing water into its two components (separating the hydrogen and oxygen atoms) using electrical currents. This process requires electrical energy. For the hydrogen to be classified as green, the electrical energy used in this process must come from renewable energy sources.

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Green hydrogen is thus hydrogen produced by clean processes that do not release carbon dioxide, unlike the other ways of producing this gas.

What can hydrogen be used for?

Hydrogen is gas that carries a high energy density per unit mass. This allows it to be a valid alternative solution for intensive industrial processes, where electricity is not a viable or effective alternative.

Hydrogen thus allows primary sources of renewable energy to penetrate into the production of gases and fuels, and not just into the production of electricity. Even if not fully electrified, this opens the door to a fully decarbonised society and unlocks the full potential of renewable energies.

As a result, hydrogen is a complement in the first phase and an alternative in the second phase, to natural gas used in industrial processes and to fossil fuels used in transport.

The various possible uses of hydrogen are summarised as follows in EN-H_2:

- **Power-to-Industry (P2I)**: Hydrogen can be used to replace natural gas as a fuel in industrial processes, including industries such as cement, refining, and chemical, metallurgical, extractive or other industries that use high temperatures in their processes;
- **Power-to-Mobility (P2M):** Hydrogen can also be used as a fuel for various types of transport, with particular potential for heavy road transport of passengers or goods, and for river, sea or even rail and air transport, where batteries do not prove to be an efficient alternative. Particular potential comes from the use of fuel cells, which can store hydrogen and use it to produce electrical and thermal energy in a controlled way;
- **Power-to-Gas (P2G):** Green hydrogen can be injected directly into natural gas networks or by converting hydrogen into synthetic methane through a methanation process. After injection into networks, it can be used for multiple purposes by end-users, including the industrial purposes mentioned above or residential purposes;
- **Power-to-Power (P2P):** Excess renewable electricity can be converted to hydrogen, stored and then reconverted back into electricity using fuel cells or turbines in appropriately adapted combined cycle power plants; and
- **Power-to-Synfuel (P2Fuel)**: The use of green hydrogen has great potential to decarbonise fuel production and replace the fuels in question with synthetic fuels of renewable origin, produced from mixtures of hydrogen and carbon dioxide captured in the atmosphere.

What are the advantages of hydrogen?

Hydrogen has the potential to deliver decarbonisation across the various sectors of the economy, with greater impact on certain sectors such as industry, transport, and energy. It can be a cost-effective solution in the medium term, with a planned set of support mechanisms which, in the short term, will accelerate the start of decarbonisation through hydrogen.

The importance of hydrogen is even more critical in light of the ambitious goals set by Portugal for 2030 and 2050, within the framework of the commitments assumed on the European and international levels. These are:

- Under the National Energy and Climate Plan for the period 2021-2030 (PNEC 2030), Portugal has committed to achieving a 47% incorporation of renewable sources in final energy consumption and at least 80% of renewables in electricity production, by 2030. It has also committed to reducing its dependence on energy from abroad to 65% and the consumption of primary energy to 35%.

- As part of the Roadmap for Carbon Neutrality, the Portuguese Government has committed to ensuring the neutrality of its emissions by the end of 2050. To achieve this, it will be necessary to reduce GHG emissions by 85% to 90% compared with 2005 and to achieve carbon sequestration levels of between 9 and 13 million tonnes of CO_2 in 2050.

As highlighted in EN-H_2, achieving carbon neutrality in 2050 implies the total decarbonisation of the electricity production system and of urban mobility. It also implies profound changes in the way we use energy and resources, investment in circular models, and the enhancement of carbon sequestration capacity through forests and other land uses.

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The idea previously created was that the most efficient and economically viable way to achieve decarbonisation commitments was to electrify consumption in general. However, it is known that there are sectors where electrification is not an alternative that can be considered. These include heavy industry, air transport and the shipping segment.

We have already highlighted briefly the focus on production and incorporation of hydrogen in Portugal as a substitute, for example, for fossil fuels. This makes it possible to overcome difficulties in the choice of electrification, which, besides not being the most economically effective solution, has proved technically infeasible in some sectors.

Moreover, the potential of hydrogen is based on the fact it is produced from endogenous sources, in which Portugal is particularly competitive, and on it being an energy carrier with high energy density. Furthermore, it can store renewable electricity for long periods of time and it allows the emergence of other renewable-based fuels. These features will be very useful in intensive industrial processes and mobility in the future.

According to EN-H_2, investment in the hydrogen economy is also an economically strategic option, because it promotes economic growth and employment through the development of new industries and associated services.

In addition to contributing to the achievement of decarbonisation and economic growth targets, hydrogen brings across-the-board advantages in the energy sector. This includes the gas sector and the fuel sector, and through synergies with the electricity sector (something EN-H_2 calls sector coupling):

- It allows the use of the installed infrastructure for transport, distribution and storage of natural gas, through the injection of hydrogen. This avoids this infrastructure potentially lying idle in a scenario of reduction in gas consumption. Moreover, and on the contrary, it enables greater profitability through the new investments necessary for its gradual adaptation to delivering hydrogen;

  In this regard, the ERSE recently published its Opinion on the Ten-Year Indicative Plan for Development and Investment in the Transport Network, Storage Infrastructures and Liquefied Natural Gas Terminals for the 2020-2029 Period. This opinion highlights the objective of gradual adaptation of the infrastructures of the National Natural Gas System (Sistema Nacional de Gás Natural or "SNGN") to receive decarbonised gases. This will give effect to the energy policy and thus further the use of the infrastructures, even in a context of a general reduction in sources of greenhouse gas emissions.

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  In particular, the ERSE Tariff Committee recommended the adoption of incentives and stimulus packages to incorporate decarbonised gases into the SNGN. Examples include pilot projects and the removal of any regulatory barriers to the injection of decarbonised gases into the SNGN.

  As a result, the ERSE points out that the investment plan for the transport network, storage infrastructure and liquefied natural gas terminals should, in the future, ensure the new investments necessary for energy transition. It should also ensure the economic sustainability of the sector and seek to avoid new investments that become idle before the end of their useful life.

- It allows the production of clean synthetic fuels that can be an alternative to fossil fuels. It is also a clean alternative to the total electrification of the transport sector.

- It allows the flow of electrical energy produced in moments of excess production (something that will be probable in a scenario of strong penetration of renewable electric generation) and the storage of energy for long periods of time in the form of hydrogen (gaseous or liquefied), with the possibility of its eventual conversion into electric energy, through gas plants or fuel cells.

Thus, in short, EN-H_2 points out that the main advantages of the use of hydrogen are:

- As a complement to the electrification strategy, it allows a reduction in the costs of decarbonisation;

- It substantially increases the security of supply in a context of decarbonisation, as hydrogen allows renewable electricity to be stored for long periods of time;

- It reduces energy dependency by using endogenous sources in its production;
- It reduces GHG emissions in various sectors of the economy, as it facilitates the substitution of fossil fuels (e.g., the refining, chemical, metallurgy, cement, extractive, ceramics and glass industries);
- It creates efficiency in the production and consumption of energy, by allowing for solutions on a variable scale, tailored to needs, close to the place of consumption and distributed throughout Portugal;
- It promotes economic growth and employment through the development of new industries and associated services.

Portugal objectives for 2030

5%
Of final energy consumption

5%
Of consumption by the road transport sector

5%
Of consumption by industry

15%
Injection into natural gas

50-100
Filling stations

2 GW
Installed capacity in electrolysers

€7 BN
Investment in hydrogen production projects

€300-600 M
Reduction in imports of natural gas

€900 M
Support for investment and production

The main challenge identified in the production of green hydrogen is probably the cost of electric energy needed to produce hydrogen. It was pointed out that the cost of electric energy would have to decrease significantly, or the efficiency and durability of the electrolyser equipment would have to increase, or the cost of carbon would have to increase, for this technology to become viable.

It turns out that the prices of electricity production from renewable sources, in particular solar photovoltaic energy, have been falling substantially in Portugal. In particular, the auction of capacity to produce photovoltaic solar energy held in 2019 saw the lowest prices in Europe and worldwide minimums. They reached a weighted average tariff of €20.33/MWh, with a minimum of €14.76/MWh and a maximum of €31.16/MWh.

This circumstance reinforces the perception of Portugal's potential to produce green hydrogen, either for domestic consumption or for export.

"The prices of electricity production from renewable sources, in particular solar photovoltaic energy, have been falling substantially in Portugal."

What is the hydrogen value chain?

The hydrogen value chain includes, in practice, three phases, comprising *(i)* the production of hydrogen, *(ii)* its storage, distribution and supply, and *(iii)* its end use:

- The first stage of the hydrogen value chain comprises its **production** and different paths, processes and associated technologies have been identified. Depending on the scale required, a distinction is made between *(i)* large-scale (centralised) production, and *(ii)* small-scale (decentralised) production. In the case of Portugal, EN-H_2 encourages a combination of large-scale centralised production (for example, the Sines Industrial Project), and decentralised production with a variable scale that is, ideally, close to the consumption sites;
- The second phase of the hydrogen value chain comprises its **storage, distribution and supply**. This phase starts with the storage of hydrogen, after it is produced, either in gaseous or liquefied (or even solid) form and ends with the delivery for its final use. This second phase of the hydrogen value chain includes processes that break down into sub-processes such as underground gas storage, liquefaction, compression, storage and distribution in gas networks, road and sea transport, or refuelling. Likely combinations of hydrogen supply processes may be:

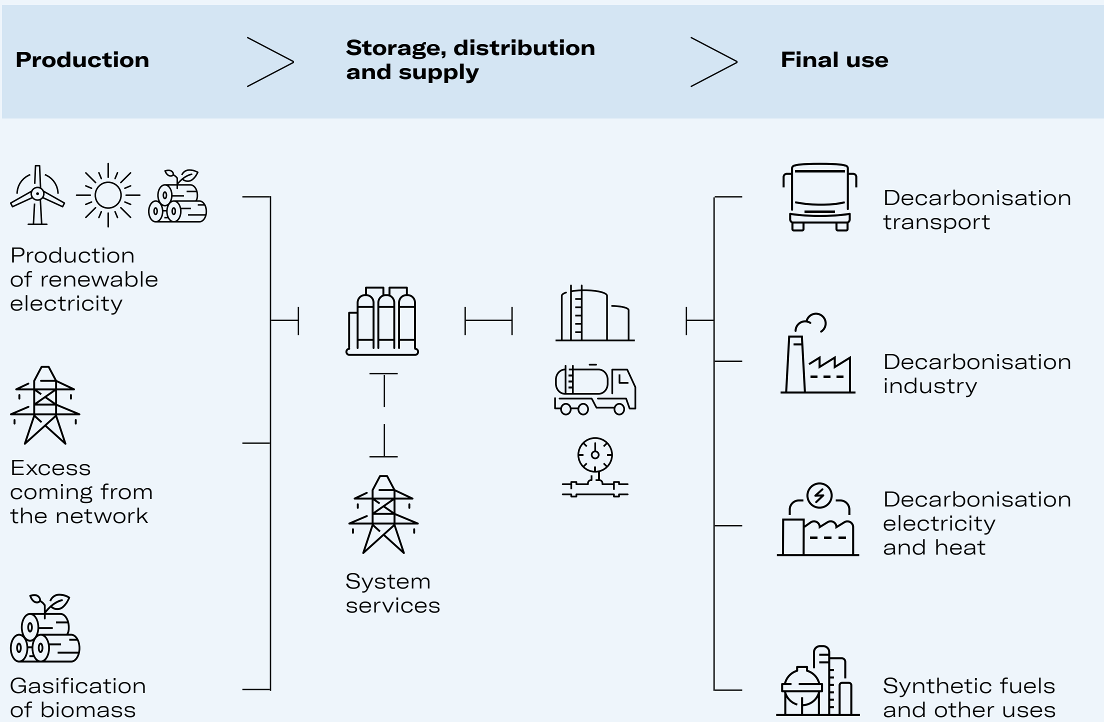
  i) Road distribution in the form of liquefied/compressed gas, ending with a liquid-to-liquid (L2L) refuelling process for liquid-to-gas (L2G) and gas-to-gas (G2G) cryogenic hydrogen storage systems on various scales;

  ii) Distribution of hydrogen by vessels in the form of liquefied hydrogen, including delivery for end use with pipelines and road transport;

  iii) Distribution of hydrogen gas, or mixed with natural gas, by a pipeline system.

- Finally, in its third stage, the hydrogen supply chain is directed at the main **end-use** applications, particularly in the mobility and transport sectors, and in industry. In stationary residential and industrial applications, hydrogen and natural gas mixtures can be applied to generate heat and electricity.

Generic scheme of the hydrogen value chain, from production to final use



EN-H_2: Objective and main projects

The goal of EN-H_2 is to serve as a framework to organise projects in the hydrogen sector in Portugal that are capable of mobilising reproductive investment.

EN-H_2 aims to achieve a total production capacity of H_2 in Portugal of up to 2 GW in 2030 and 5 GW in 2050, with hydrogen having a weight in total final energy consumption of up to 5% in 2030 and 20% in 2050.

Among the main projects listed in EN-H_2, in the context of boosting the use of hydrogen and promoting decarbonisation and energy efficiency, we would highlight the following:

- Industrial green hydrogen production project in Sines: with a planned base investment of over €2.85 billion, it is a project that provides for the construction of a solar plant to allow water electrolysis and thus produce hydrogen. It also provides for the possibility of production on an industrial scale, with this unit's total capacity reaching 1 GW by 2030;

- Decarbonising the transport sector: together with and in addition to electricity and advanced biofuels, hydrogen will be used to achieve decarbonisation, especially for the transport of goods in heavy vehicles and for buses;
- Decarbonising a priority sector of domestic industry, possibly steelmaking or underground mining, because of their size and weight in greenhouse gas emissions;
- Use of domestic and industrial wastewater to produce hydrogen; or
- Creation of a leading collaborative laboratory (CoLab) that will research and develop the relevant components of the hydrogen value chain, with support from highly qualified human resources.

The industrial project in Sines

The main project planned in Portugal in the hydrogen sector is the Sines Industrial Project.

The Sines Industrial Project is one of the most promising and high-profile EN-H_2 projects. In fact, concluding a large scale anchor project to produce green hydrogen on an industrial scale is fundamental to creating a hydrogen economy in Portugal, with the dimensions of industrial scale production, processing, storage and transport, and, at the same time, capacity for internal consumption, and external consumption through exports.

It is intended that this project to build an industrial unit in Sines to produce green hydrogen will have a total capacity in electrolysers of at least 1 GW by 2030 and will powered by electricity from renewable sources, namely solar and wind.

EN-H_2 states that the hydrogen production capacity at the Sines Power Plant will be flexible and should grow according to the needs of the Portuguese market, by stimulating consumption and setting incorporation targets, and of the international market through exports. This plant will have an associated capacity to produce electricity on a self-consumption basis from renewable sources. It will be sized to maximise hydrogen production at the lowest possible cost.

"A large scale anchor project to produce green hydrogen on an industrial scale is fundamental to creating a hydrogen economy in Portugal."

Thus, EN-H_2 explains that the objective of this industrial project is to implement a solution that optimises the resources for electricity production and, in turn, achieves the maximum optimisation of the cost of hydrogen production. Associated with the project will be renewable energy production facilities (solar and/or wind) facilities. They will probably be on a self-consumption basis and be dedicated to feeding the electric energy needs of the electrolysers.

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Resources available to leverage the Sines project

What is necessary

Qualified personnel
To operate the H_2 production unit and other related infrastructures

Land
To install the electricity production, the electrolysers and associated equipment

Renewable resources
To produce electricity for the electrolysers and associated equipment

Connection to networks
To ensure an injection point into the power grid and to inject H_2 into the natural gas grid

Hydrogen terminal
To allow the export of H_2

What is available

Qualified personnel
Proveniente da central a Carvão que será descomissionada

Land
Currently available together with the land of the coal plant that will be decommissioned

H_2 consumers
Proximity to large consumers (e.g., refinery)

Renewable resources
Location with solar and wind resource availability

Connection to networks
Proximity to the natural gas transmission network and the HV power grid with available capacity

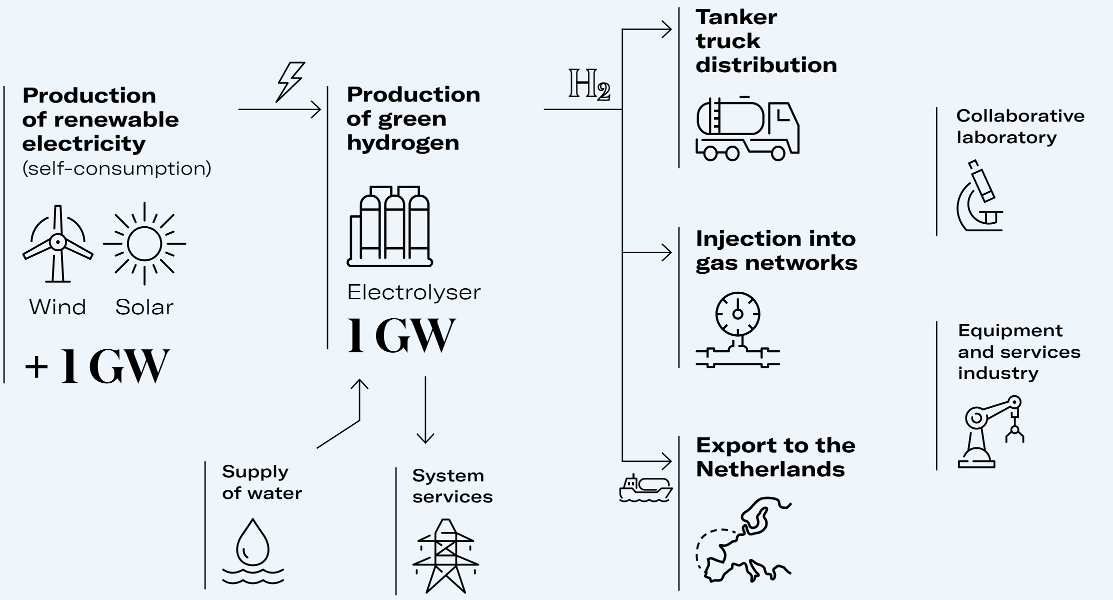
Natural gas terminal
Current NG infrastructure with possibility of expansion to accommodate new infrastructures

The hydrogen produced in Sines will be distributed in three ways: *(i)* direct injection into the natural gas networks, *(ii)* distribution by tanker truck to various points of consumption (e.g. service stations with hydrogen pumps and/or final consumers) and *(iii)* export via the Sines terminal.

As a first step, and given the smaller size of the project, hydrogen produced at Sines is expected to be fully absorbed by the domestic market. However, as production capacity grows, there will be increasing exportation to the European market, in particular, to the Netherlands, by sea, under the strategic partnership agreed between the two countries.

The implementation, and part of the success of the Sines project, is based on a strategic partnership with the Netherlands. This partnership will, first, give a European dimension to the project as a way of securing EU funding and finding partners for the consortium. Second, it will create synergies between public bodies and companies to develop a Europe-wide hydrogen market, to combine efforts for setting standards, and to develop R&D projects.

Composition of the green hydrogen production project on an industrial scale in Sines



Call to express an interest in the sines hydrogen project: Important Project of Common European Interest (IPCEI) in the hydrogen value chain

Order 6403-A/2020 was published on 17 June. By this order, the Government opened up a period for Portuguese or European companies or other bodies to express an interest in participating in the future Important Project of Common European Interest (IPCEI) on hydrogen. This is open to companies or other bodies whose proposed projects result in added value for the country, by establishment in Portugal, job creation and reduction of CO_2 emissions per project presented.

Under Order 6403-A/2020:

- **The deadline** for submitting expressions of interest is 17 July 2020;
- **The result** of the admission of projects must be completed by 27 July 2020; and
- The expression of interest is made in a **pre-defined format ("Project File")**, available at www.portugalenergia.pt. Its contents include the previous experience of the interested party in the hydrogen value chain, the estimated dates of the project, the resources involved, and the impact of the project. It must be sent to the email address gabinete.seaene@maac.gov.pt and specify the focal point and the contact information.

When the project admissions phase is concluded, an *infoday* will be organised to clarify any additional issues and it will take place on 27 July 2020.

"The Sines Industrial Project is a strategic example of investment in a new industrial sector dedicated to green hydrogen."

The Government believes this industrial project in Sines has potential to be or be part of an Important Project of Common European Interest (**IPCEI**), which are developed according to the criteria established in Communication 2014/C 188/2 from the European Commission. The project is being supported in the Portuguese Government by the Ministry of the Environment and Climate Action. Moreover, it is contributing to the emergence of a hydrogen market and making the exportation of hydrogen into a reality.

In fact, the Sines Industrial Project is a strategic example of investment in a new industrial sector dedicated to green hydrogen. It is intended to be a large scale anchor project on an industrial scale with the capacity to simultaneously integrate the dimensions of production on an industrial scale, processing, storage and transport, and internal and external consumption, through exports, based on strategic partnerships, both at the national and European level.

The truth is that this industrial project has aroused a great deal of interest on the part of the Portuguese business sector. Therefore, the Government considered it advantageous to begin a process allowing companies and other bodies to express an interest and giving them the opportunity participate in various projects in this sector, provided national and European strategic coherence is guaranteed. The projects are:

- Integrated projects covering as of the hydrogen value chain as possible, which are valued.
- Production and consumption of green hydrogen with a special focus on innovation, either to satisfy domestic consumption needs (first priority) or for export (as soon as the necessary conditions are met). There is also the possibility of decentralisation of production and consumption, benefiting from the liquidity in the national hydrogen market created largely by the Sines project. This takes advantage of existing gas infrastructures and/or constitutes important added value in terms of R&D&I (research, development and innovation), leading to improvements in performance and reductions in production costs.
- To complement an integrated value chain at the European level, in particular, in the elements associated with exports, such as maritime transport, reception and storage, logistics and international off-take. The project is intended to include the increase in industrial production capacity through the electrolyser in Sines. It is also intended to include the constructing of infrastructures that enable transformation into liquid hydrogen (LH_2), liquid organic hydrogen carriers (LOHC) using green ammonia (NH_3). Overall, the project is intended to include a large innovation and industrialisation component.
- The establishment of a collaborative laboratory (CoLab) is another area considered to be of great relevance to the success of the national strategy.
- The new R&D areas and skills identified include the possibility of producing hydrogen from saltwater. This is an area that is expected to be boosted with support for the experimental development process or first innovative production process, with a view to its commercialisation.

The publication of the call for expressions of interest in being a part of the future hydrogen IPCEI, including all relevant information, is available on the site www.portugalenergia.pt, where you can find a summary sheet to express your interest in Portuguese or in English and information on the conditions for the IPCEI, the specific criteria, and the deadlines to send documents

Financing and support mechanisms provided for in EN-H_2

The projects to be developed in the hydrogen sector will be financed by investors, but there are several forms of public support that can be channelled to this end, either at the European or national level.

> **"Tax policy could also play an important role in the energy transition."**

The public support for investment and production that is expected to be or could be allocated to these projects is particularly important. This is especially so because hydrogen is at an early stage of its implementation and there are no developed markets and no pricing system that can guide the decisions of the different economic players. Tax policy could also play an important role in the energy transition by reflecting and incorporating the main social and environmental costs, internalising externalities, and influencing behavioural change, as a determining factor for competition and fairness.

EN-H_2 also highlights that decarbonisation calls on all members of society and, of course, on those involved in capital market investment. It also notes that the first legislative package on sustainable financing is being finalised.

The highlights regarding the **financing** of hydrogen projects are:

- **European funding instruments** with potential to support hydrogen projects, some of which are still under negotiation, These include InvestEU, the Connecting Europe Facility, Horizon Europe, Innovation Fund, InnovFin Energy Demo Projects, EEA Grants 2014-2021, the Just Transition Mechanism, the European Recovery Fund, and funding through the European Investment Bank.
- **The National Instruments** to support the decarbonisation of the economy and the energy transition, which co-finance public and private projects. These include the Operational Sustainability and Efficiency Programme in the Use of Resources, the Innovation Support Fund, the Environmental Fund, the Consumption Efficiency Promotion Plan, Portugal 2030, the Financial Institution for Development, and the Blue Fund.

The IPCEI (Important Projects of Common European Interest) initiative of the European Commission, which covers the hydrogen value chain, is particularly significant to financing by European instruments. Access to IPCEI status facilitates the priority assessment of the project for European funding. It also make it possible to accumulate funding sources and to obtain funding for up to 100% of eligible expenditure. For this purpose, in addition to the importance of the project and the technological or financial risk involved, the project must involve more than one Member State and it must be possible for its benefits to extend to a significant part of the Union. As a result, Portugal's partnership with the Netherlands and the export potential of the project are crucial.

"EN-H_2 provides other support mechanisms to encourage new investment. These mechanisms are on various scales and in various sectors of activity."

In addition to financing mechanisms, which are important support instruments for new projects, EN-H_2 provides other **support mechanisms** to encourage new investment. These mechanisms are on various scales and in various sectors of activity and highlights include:

- **Differentiated Tariff Treatment:** EN-H_2 points out that the injection of hydrogen into natural gas networks (transmission and distribution) can benefit from a partial or full exemption from payment of network access tariffs for an initial period, provided it is not an excessive burden on the system;

- **Production Support:** provision is made for a variable premium on the price of natural gas that makes it possible for the production price of green hydrogen to be the same as the price of natural gas, in order to make H_2 competitive with its main competitor. Compatibility with the state aid rules must be ensured. Therefore, the support to be granted will follow a competitive tendering procedure based on clear, transparent, non-discriminatory criteria, and it will be open to all producers of renewable gases. Considering the importance of hydrogen in the transport sector, EN-H_2 also provides for the assessment of a similar mechanism for production not destined to be injected into the natural gas network, but rather for distribution at filling stations for use in fuel cell vehicles;

- **Participation in the System Services Market:** under the regulations in force, the system services market is intended to ensure the operation of the national electrical system under appropriate technical conditions. Given the characteristics of hydrogen, in particular, the complementarity it creates between the gas and electricity systems (sector coupling) and its potential to store energy, there is an opportunity for associated systems to participate in the system services market and thus contribute to ensuring a better operation of the energy system;

- **Replacement of feed-in tariffs:** EN-H_2 provides that existing renewable electricity production assets selling electricity to the CUR, including wind or photovoltaic, which are operational and benefit from a feed-in tariff (around 6.8 GW), can be fully or partially converted to green hydrogen production, by adding hydrogen production technology (electrolysers) at the site where the power plant is installed and licensed;

- **Taxation:** EN-H_2 assumes that during 2020, support for hydrogen projects will be studied, assessed and proposed, either by granting tax benefits or through positive discrimination in applicable taxes, based on the advantages of green hydrogen; or

- **Guarantees of Origin (GO)[1]:** although not a support mechanism as such, GOs are intended to prove to the end consumer that a given amount of energy has been produced from a certain technology or renewable primary source. For this purpose, EN-H_2 states that, during 2020, the necessary steps will be taken to implement a system of GOs for renewable gases. This system will make it possible to issue, transfer and use guarantees of origin, to boost the market for GOs allocated to renewable gases production.

The necessary revision of the legal framework

To implement the projects and measures set out in EN-H_2, the necessary legislation, regulations and framework of rules constituting a legal framework promoting hydrogen in Portugal will have to be approved. All of these will have to cover the various sectors of the economy and provide competitiveness between efficient and cost-effective energy alternatives.

In fact, as yet, there is no Portuguese legislation on hydrogen, so the plan set out in EN-H_2 will have to be implemented through legislation that serves as a framework for the development of projects in this sector.

Although there is no defined schedule for the approval of this legal framework, it is expected that it approval may even come before the end of 2020. ■

"There is no Portuguese legislation on hydrogen, so the plan set out in EN-H_2 will have to be implemented through legislation that serves as a framework for the development of projects in this sector."

The images in this Informative Note were taken from the EN-H_2 document issued for public consultation.

1 For a more detailed analysis of the new regulations in force in Portugal applicable to GOs, in particular, Ministerial Order 53/2020 of 28 February 2020, in force since 1 March 2020, please see our Informative Note on the subject, available at https://www.plmj.com/en/knowledge/informative-notes/Green-certificates-Market-now-active-in-Portugal/30645/.