SEAFUEL

Sustainable integration of renewable fuels in local transportation

WP 6
Tenerife Hydrogen Sustainable Energy and Climate action Plan (SECAP)

Project Details

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Deliverable Details

Component	
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Title of Deliverable	
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Dissemination level – Confidentiality

PU	Public, to be freely disseminated, e.g. via the project website	**X**
CO	Confidential, only for members of the consortium including the Commission/EACI Services	

H_2 Sustainable Energy and Climate Action Plan – Tenerife

Introduction

Spain is at the forefront of renewable energy integration, having built a robust electricity system, that utilises both wind and photovoltaics, to reach large renewable energy penetration in the 2000s and early 2010s. The country hopes to utilise its well-established gas storage and transport systems, alongside this success in renewable energy, to propel its green hydrogen production sector to become a major Spanish industry, with international status.

Approved in early October, the Spanish National Hydrogen Plan (NHP) aims to imminently boost the country's clean hydrogen production. The plan seeks to drive rapid growth in this area, with the primary aim of replacing industrial use of the gas, with secondary goals related to mobility and other adjacent sectors. The NHP will contribute significantly to achieving legally obligating greenhouse gas emission reduction targets, established through national and international legislation such as The Paris Agreement. Despite the lack of a specialised strategy for Tenerife and other Spanish islands, Tenerife has taken an active interest in developing its own hydrogen sector through participation in European projects, such as SEAFUEL. The island has recognised the opportunity, both environmentally and economically, that a hydrogen sector possesses and wants to take full advantage of it.

Through the creation of a roadmap for the region, the SEAFUEL project is helping the island of Tenerife to realise its hydrogen potential. In the roadmap, we have provided an assessment of local energy matrices, and their relative hydrogen readiness, in order to produce a set of recommendations designed for policy makers. This document represents a complementary summary of suggested actions from the roadmap, complete with respective timeframes.

Should more information be required please see the complimentary document entitled 'SEAFUEL: Exploring Hydrogen Opportunities for Tenerife', or the roadmaps for other SEAFUEL regions - Northern Ireland, South West of UK, West of Ireland and Madeira.

Actions

The SEAFUEL Project has collected a group of hydrogen focused policies and actions organised into eight areas.

1 – Hydrogen production
2 – Storage, transport and distribution
3 – Decarbonisation of transport
4 – Decarbonization of Industry
5 – Decarbonisation of electricity and heat production
6 – Synthetic fuels and other uses
7 – Employment, requalification and vocational training
8 – Cross-cutting actions

Besides the general actions separated into the above sections, and given the Tenerife roadmapping activities undertaken, SEAFUEL has produced a set of specific local hydrogen actions for the region, developed according to its specific geographic and economic characteristics:

Action	**Implementation period**
Promote the production of a hydrogen strategy for the island of Tenerife and the wider Canary Islands, with a focus on their resource strengths.	2022-2023
Introduce hydrogen produced from intermittent renewable sources to energy supply and applications, contributing to the replacement of fossil fuels, and to national targets for the incorporation of green hydrogen into the wider energy sector, whilst simultaneously improving energy efficiency.	2025-2050
Promote pilot projects for the installation of a network of green hydrogen refuelling points. Including the establishment of a hydrogen highway around the island to aid the decarbonisation of local transport fleets.	2022-2050
Promote and support the creation of infrastructure for the supply of cleaner energies to ships, including electricity in ports (cold ironing), green hydrogen and green shipping. Improving the energy efficiency and emissions of maritime transport (passengers and goods) and diversification of energy sources.	2022-2050
Promote the production of hydrogen from renewable energy sources, as well as its application in the electricity producer sector, land transport, port facilities and green shipping.	2030-2050
Promote the production of hydrogen from renewable energy sources to address the energy dependency issues associated with being an island economy, as well as large-scale fuel poverty exhibited by island inhabitants.	2022-2050
Promote the training of technicians and specialists to respond to market needs in the fields of decarbonization, including computational modelling, AI, *big data analysis,* renewable energy, energy efficiency, service digitization, intelligent energy management systems, intelligent power grids, advanced biofuels, green hydrogen, electric mobility, sustainable construction, NZEB buildings, sustainable agriculture, irrigation systems, eco-driving and fleet management.	2022-2050
Promote cooperation with other regions and energy projects on a community, regional and national level. As well as participation in R&D programmes in the fields of low-carbon economy, energy efficiency,	2022-2030

renewable energy, storage, green hydrogen, advanced biofuels, renewable fuels, smart grids, agroforestry management, industry and other innovation-oriented research areas and sustainability	
Promote participation with other island-based hydrogen projects being undertaken within the EU with the view to share best practices and implement similar technologies.	2022-2035
Promote increases in installed hydrogen production capacity to enable larger renewable energy deployments by acting as an energy storage mechanism in the long-term.	2022-2050
Promote the use of H_2 within air transport. Initially with interisland travel, progressing to larger-scale domestic flights and eventually international travel as the technology matures.	2022-2030
Promote the use of hydrogen in heavy vehicles and ships to decarbonise the land and sea transport sector.	2022-2030
Use of wastewater, domestic and industrial, for hydrogen production.	2022-2050
Continue to develop relevant components of the hydrogen value chain locally with the support of highly qualified industry and research personnel.	2022-2030

1- HYDROGEN PRODUCTION

Action	Implementation period
Approve the necessary procedures for the licensing of hydrogen production installations given different configurations, including a simplified licensing mechanism for hydrogen production facilities when directly associated with an existing renewable electricity production centre.	2022-2024
Maintain a system of guarantees of origin for hydrogen.	2020 onwards
Introduce regulations to support and expand the provision of flexibility in both location and operation of the electrolyser within the energy network.	2022
Maintain and enhance hydrogen production associated with solar and wind power plants, evaluating the implementation of an incentive scheme process for hydrogen production and/or use, where it applies.	2020 onwards
Promote and support the production of hydrogen associated with wastewater treatment facilities. Optimisation of the water quality used in electrolysis to enable and maximise the use of wastewater. Develop applications and business models for water ejected from the electrolysis process.	2022-2026
Promote the adaptation of existing licensing procedures – environmental, water, industrial, municipal resources – enabling the implementation of hydrogen production projects.	2022-2024
Survey and map the potential for distributed deployment of electrolysers identifying the sites with greater potential.	2022
Design support for the development of new hydrogen production projects, fostering the emergence of new innovative technologies.	2020-2027
Promote and encourage hydrogen production, combining centralised industrial-scale projects and decentralised opportunities, of varying size, associated with the different sectors.	2020-2030
Implement further hydrogen support mechanisms, including for the sale of hydrogen, to create an incentive for hydrogen production without increasing energy costs paid by consumers.	2021-2030
Study and adopt tax benefits or positive discrimination for green hydrogen.	2022-2030
Promote hydrogen production associated with renewable energy communities.	2022-2030
Promote greater interdependence between hydrogen and the electrical network, through sector coupling, to enable the planning of ever-increasing integrated system investments.	2022-2030
Encourage and support R&D of electrolysis by promoting the improvement and expansion of production capacity, promoting synergies between academia and the business community to enhance its production on an industrial scale.	2022-2030

2- STORAGE, TRANSPORT AND DISTRIBUTION

Action	**Implementation period**
Promoting the adaptation of existing planning and investment instruments for transport and distribution networks to include hydrogen.	2022-2030
Develop methodologies for testing, regulating, and inspection of hydrogen equipment, components, and systems for transport, distribution, and storage. As well as necessary safety standards such as leak research methodologies, leak verification, tightness, and security.	2022-2025
Foster and support the development of measurement systems that will allow accurate indication of flows and volumes for different concentrations of gas mixtures in networks. Promote synergies between academia and the private sector with a view for production on an industrial scale.	2022-2025
Promote the use of hydrogen as an energy storage mechanism.	2022-2030
Ensure active participation at CEN *(European Committee for Standardization*) in the main committees relating to hydrogen.	2022-2030
Design targeted calls to support the development of new hydrogen storage and pipeline transmission projects, fostering the emergence of new innovative technologies.	2022-2027

3- DECARBONIZATION OF TRANSPORT

Action	**Implementation period**
Continue to adapt current regulations to enable an efficient rollout of hydrogen mobility into the transport sector.	2022-2024
Provide clear and concise regulations regarding the installation of hydrogen refuelling stations, featuring both off-site and on-site hydrogen production.	2022-2023
Promote and support the implementation of hydrogen mobility, and associated infrastructure, for return-to-base fleets and public service/transport fleets.	2022-2030
Promote the use of green hydrogen in public transport fleets and road transport by encouraging replacement of existing vehicles with hydrogen alternatives, as well as establishing a minimum hydrogen obligation.	2022-2030
Promote the use of green hydrogen in taxi fleets, privately owned fleets, and businesses of shared mobility.	2022-2030
Boost the transport and component industry by promoting and incentivising the use of local technology and products enabling the adoption of hydrogen mobility and the conversion of vehicles.	2022-2030
Continue participation in standardisation discussions relating to hydrogen mobility and refuelling infrastructure on a regional, national, and continental level.	2022-2050
Promote studies on public perception, impact on employment, health and safety, and regional/local development.	2022-2023
Design targeted calls to support the development of new projects for the decarbonisation of transport, fostering the emergence of new innovative technologies.	2022-2027

4- DECARBONIZATION OF INDUSTRY

Action	**Implementation period**
Promote and encourage the replacement of natural gas and fossil fuel-based feedstocks with green hydrogen and raw materials produced using green hydrogen (e.g. green steel), with the determination of targets for its introduction.	2020-2030
Regulate the installation of hydrogen production, storage, and supply systems in industrial installations.	2020-2023
Encourage the definition of quality and safety standards for equipment that the use of hydrogen in the production process.	2020-2023
Promote the decarbonisation of cogeneration using natural gas, promoting the replacement by renewable alternatives, including hydrogen.	2020-2030
Support the implementation of industrial-scale pilot projects for the introduction of blue/green hydrogen in the various subsectors of industry (refining, chemical, metallurgical, cement, extractive, etc.), contributing to the total decarbonization of this sector.	2020-2025
Promote and support the replacement of equipment that enables the integration of hydrogen in production processes.	2020-2030
Encourage the implementation of local hydrogen production projects associated with the capture and use of CO_2 in industrial processes.	2020-2030
Encourage R&D for the development and demonstration of 100% hydrogen-based heat production technologies for industrial applications.	2020-2025
Design calls targeted and intended to support the development of new projects for the decarbonisation of the industry through hydrogen, fostering the emergence of new innovative technologies.	2020-2027

5- DECARBONIZATION OF ELECTRICITY AND HEAT PRODUCTION

Action	**Implementation period**
Promote the use of hydrogen for energy production (electricity and heat), using hydrogen in buildings and communities' energy.	2020-2030
Explore and take advantage of the energy storage potential of hydrogen in a complementarity relationship between the electricity and heat sectors.	2020-2030
Regulate the use of hydrogen for combined electricity production and heat in industry, buildings and energy communities.	2020-2023
Promote the decarbonisation of natural gas and fossil-fuel based plants in a gradual and sustained way with a view to their total decarbonisation by 2050, with the determination of minimum limits for the incorporation of hydrogen.	2020-2050
Promote the decarbonisation of cogeneration by utilising renewable alternatives, including hydrogen.	2020-2030
Perform preliminary analysis of the adequacy needs of household equipment that enable the integration of hydrogen as a fuel.	2020-2023
Promote the replacement and/or repurposing of equipment which could lead to integration of higher levels of hydrogen within both the electricity and heating sectors.	2020-2030
Promote demonstration projects for fuel cells within buildings for the combined production of electricity and heat, including conducting public perception studies and tests on the use of equipment by consumers.	2020-2025
Encourage R&D around electricity production utilising decarbonised cogeneration, high-temperature fuels, batteries, and green hydrogen.	2020-2030
Design targeted calls established to support the development of new decarbonisation projects for electricity and heat production through the promotion of new innovative technologies.	2020-2027
Encourage the implementation of 100 % renewable city pilot projects, where hydrogen emerges as a complementary solution for total decarbonisation energy consumption.	2020-2030
Include hydrogen as a potential option when assessing the level of security of supply assessments national energy system (electricity and natural gas).	2020-2030

6- SYNTHETIC FUELS AND OTHER USES

Action	**Implementation period**
Promote and encourage the production of synthetic fuels (liquid or gaseous) with hydrogen feedstocks, including the capture, storage, and use of CO_2.	2020-2030
Encourage the definition of quality and safety standards to produce synthetic fuels from green hydrogen.	2020-20230
Promote the use of hydrogen in the production of advanced biofuels, from waste.	2020-2030
Carry out a foresight assessment of synthetic fuel production potential from hydrogen, in addition to other forms of energy, and how they can contribute to the decarbonisation of the economy - particularly in sectors with fewer options (e.g. aviation), identifying potential projects to be implemented in the coming years.	2020-2025
Encourage R&D in the production of new synthetic fuels with hydrogen feedstocks, including the capture, storage, and use of CO_2.	2020-2030
Design targeted calls to support the development of new fuel production projects and other uses through the hydrogen, fostering the emergence of innovative new technologies.	2020-2027

7- EMPLOYMENT, REQUALIFICATION AND VOCATIONAL TRAINING

Action	**Implementation period**
Identify and transform non-higher-level and vocational qualifications in-line with the requirements for the renewable energy sector.	2020-2023
Promote the mapping of cross-cutting skills, as well as the specific skills required for the establishment of a hydrogen economy.	2020-2023
Promote the alignment and strengthening of non-higher-level formative education aimed at the different technologies and value chains of the hydrogen.	2020-2023
Systemise project quantitative impact estimates and structuring initiatives in job creation.	2020-2023
Produce studies with academic institutions assessing the skills- and person-gap currently exhibited by the sector and how available training could affect employment figures.	2020-2025
Launch a strategic vocational training plan for the energy transition including specific areas dedicated to hydrogen, also aligned with other decarbonisation strategies.	2020-2025
Establish a collaborative vocational training network for the energy transition and renewable energies. Also, consider the establishment of a national centre of excellence in these fields.	2020-2025
Disseminate and promote the attractiveness of vocational training in the areas of implementation of the different technologies and value chains of hydrogen.	2020-2030

8- CROSS-CUTTING ACTIONS

Action	**Implementation period**
Promote life-cycle assessment studies for the whole breadth of hydrogen sector (from production to applications), including environmental, social and economic impacts.	2020-2023
Promote the realization and implementation of projects for evaluation, design, and development of new business models (value chain: production-distribution-consumption).	2020-2025
Boost international cooperation around hydrogen, through memorandum of understandings and other forms of cooperation.	2020-2030
Ensure participation in the main European and international forums around hydrogen, including under the European Clean Hydrogen Alliance, Hydrogen Energy Ministerial and the Clean Energy Ministerial.	2020-2021
Encourage the participation of national companies and institutions in forums and relevant initiatives in the field of hydrogen at the European level and international level.	2020-2025
Stimulate the installation of new industries and companies that develop activity around the main components of the hydrogen supply chain value (e.g., production of electrolysing scans).	2020-2030
Stimulate the conversion or replacement of carbon-intensive activities with, lower emission, hydrogen alternatives in applicable sectors.	2020-2030
Develop materials and guidelines for training purposes on procedures related to the production, handling, transport and use of hydrogen in the various sectors.	2020-2033
Promote, collaborate, and support the development of new skills and qualifications related to the production, handling, transportation, and use of hydrogen in the various sectors.	2020-2030