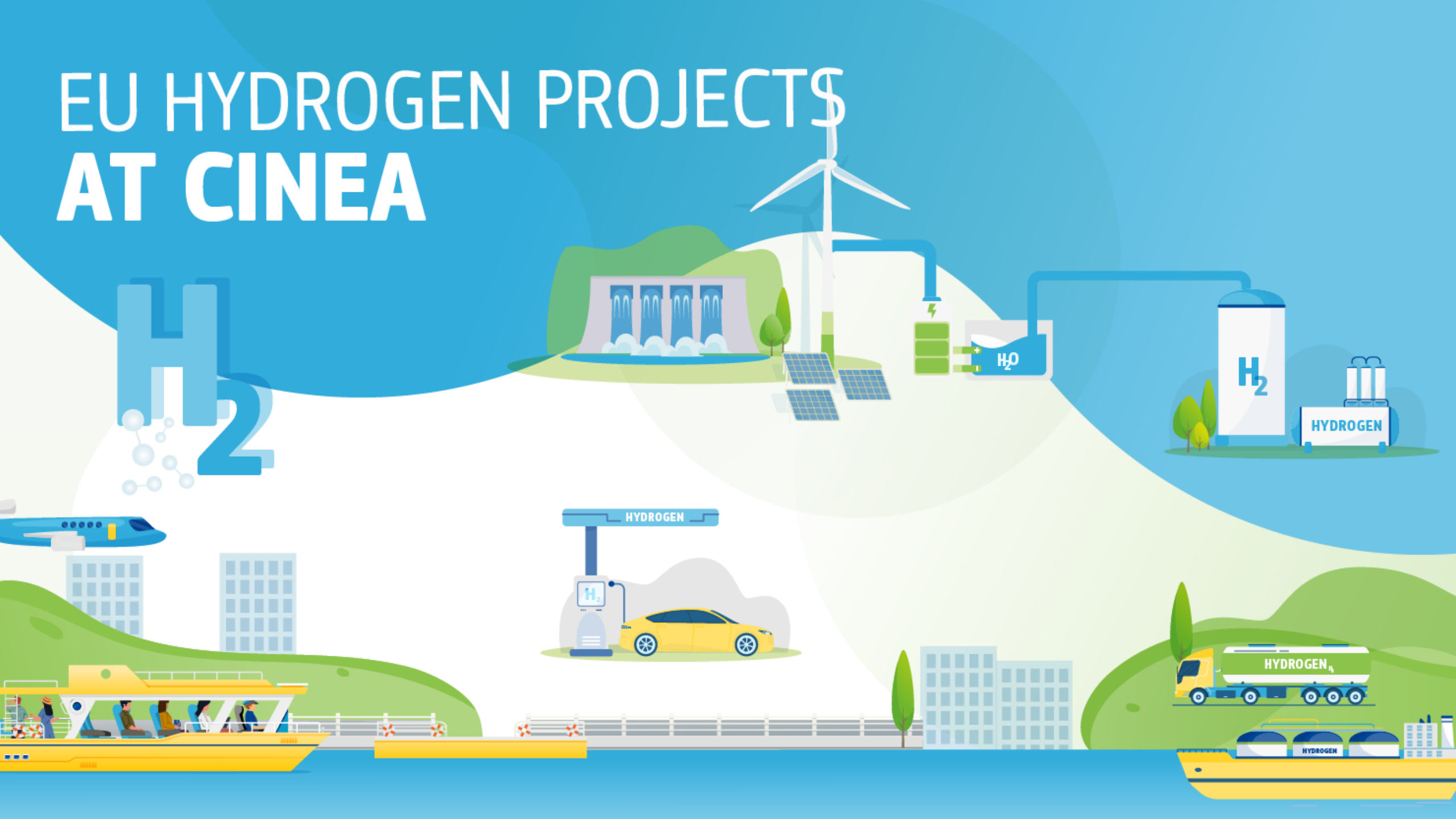


EU HYDROGEN PROJECTS AT CINEA

H₂



Innovation Fund



H_2

A stylized illustration of a white hydrogen storage tank with a blue top and bottom. The chemical formula H_2 is written in blue on the side of the tank. The background features abstract blue and green shapes.



HYDROGEN

A stylized illustration of a white hydrogen storage tank with a blue top and bottom. The word "HYDROGEN" is written in blue on the side of the tank. The background features abstract green and blue shapes.

Innovation Fund Hydrogen Projects

highlighted projects

[AIR](#)

[ELYgator](#)

[FUREC](#)

[GreenH2](#)

[GreenH2CY](#)

[H2 Valcamonica](#)

[HH](#)

[HYBRIT demonstration](#)

[HySkies](#)

[HYVALUE](#)

[N2OWF](#)

[VOZARTEK](#)

[ZE PAK green H2](#)



AIR

Production of **sustainable methanol** as a raw material for chemical products by the first-of-a-kind **Carbon Capture and Utilisation process** integrated with a **world scale electrolysis unit**

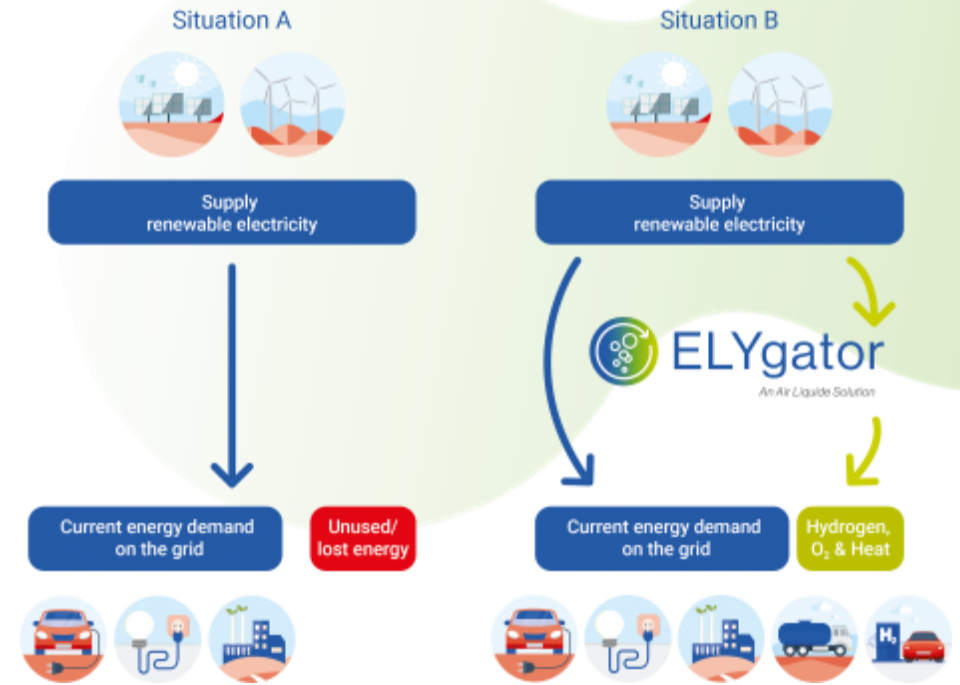
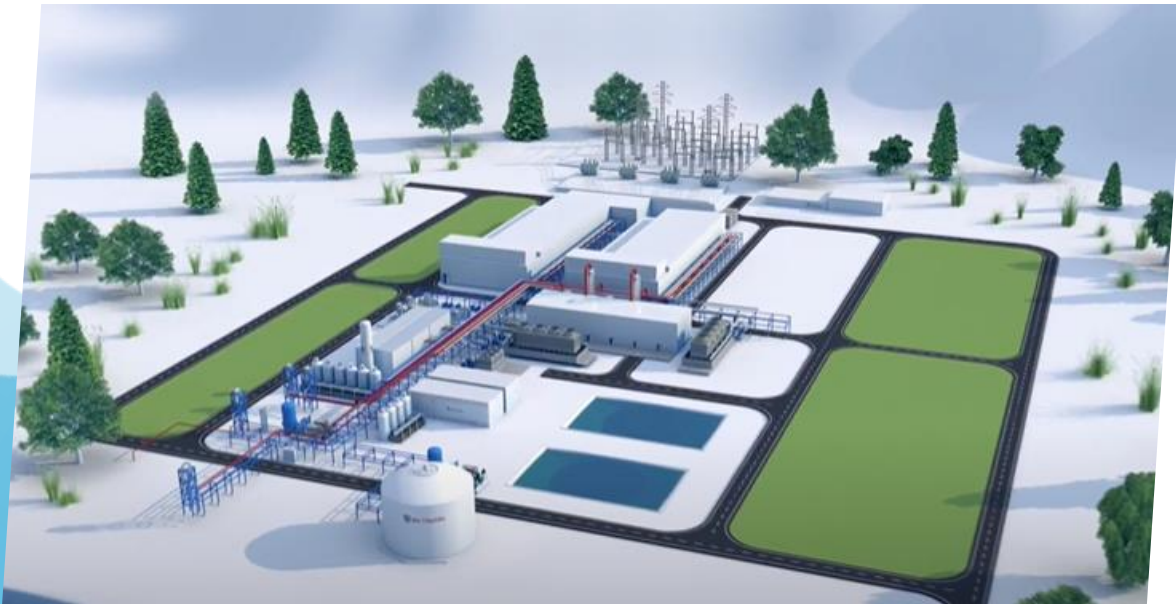
See more:

[AIR](#)



ELYgator

Kickstarting a renewable hydrogen value chain for industry and mobility: highly integrated, **flexible large scale 200MW water electrolyser producing renewable hydrogen and oxygen**



See more:

[ELYgator](#)



The Project FUREC (FUse, REuse, ReCycle) transforms non-recyclable solid waste streams into hydrogen and provides circular feedstock to the chemical industry.

The FUREC process uniquely combines torrefaction, milling and entrained flow gasification, followed by the transformation of synthetic gas into CO₂ and hydrogen via shift conversion.

The FUREC plant will produce 54 000 tonnes of hydrogen per year while avoiding 100% of greenhouse gas emissions compared to the reference scenario during the first ten years of operation.

See more:

[FUREC](#)



GreenH2

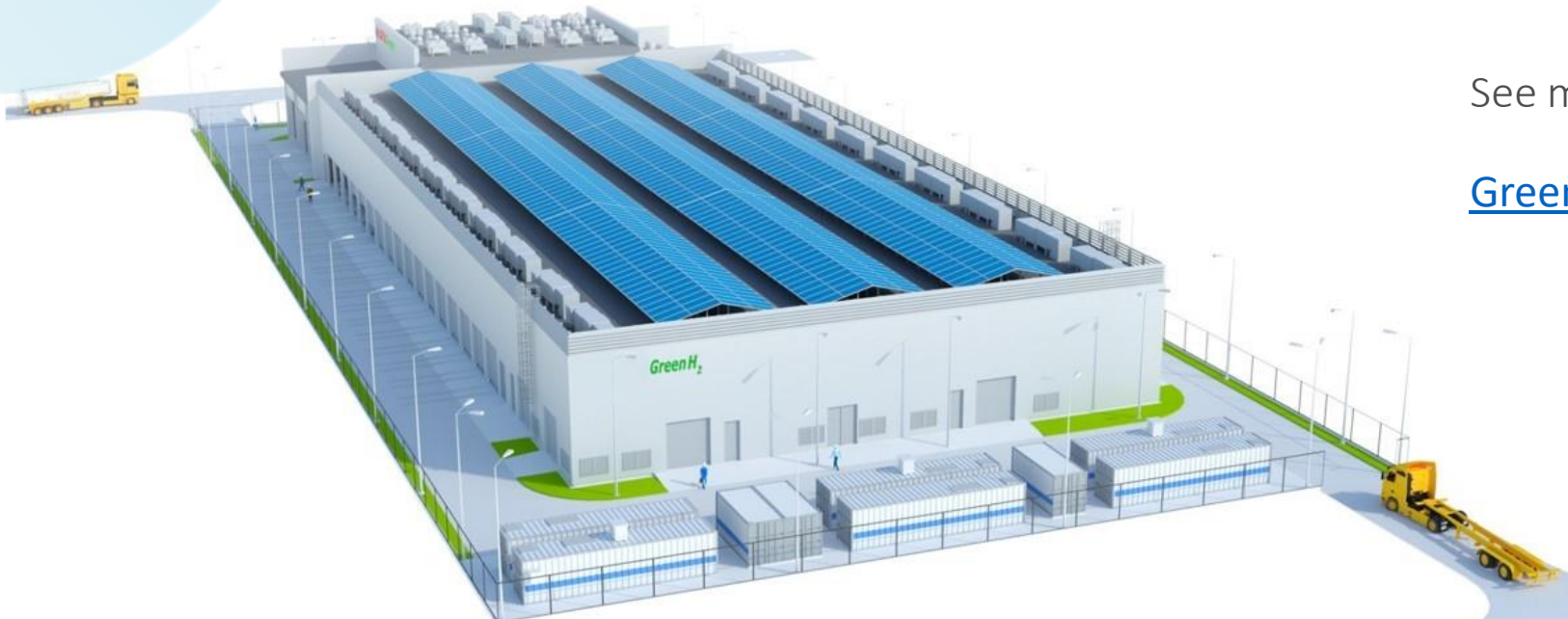
Small-scale green hydrogen production facility

The project's objective is to build a modular and scalable hydrogen production system, that includes an electrolyser powered by solar panels along with energy management and residual heat recovery systems



See more:

[GreenH2](#)



GreenH2CY

Green Hydrogen Project for Transport in Cyprus

The project will include a refueling station and hydrogen storage facilities, which will allow the electrolyser that produces the hydrogen to be used flexibly and to be run during off-peak hours in the electricity market.



See more:

[GreenH2CY](#)

H2 Valcamonica



Green hydrogen for the decarbonisation of Valcamonica

The project is the first step in the ambitious goal of creating the first Italian green hydrogen valley using highly innovative technologies to produce green hydrogen that will be used to replace traditional fossil fuels in the transport and industrial sectors.



See more:

[H2 Valcamonica](#)

HH - Holland Hydrogen

Holland Hydrogen (HH) plans to build a 400 megawatt (MW) electrolyser in the Port of Rotterdam to produce green hydrogen, using renewable electricity from offshore wind farms in the North Sea. HH will be developed in two 200 MW phases and will be the first electrolyser project of this scale.



See more:

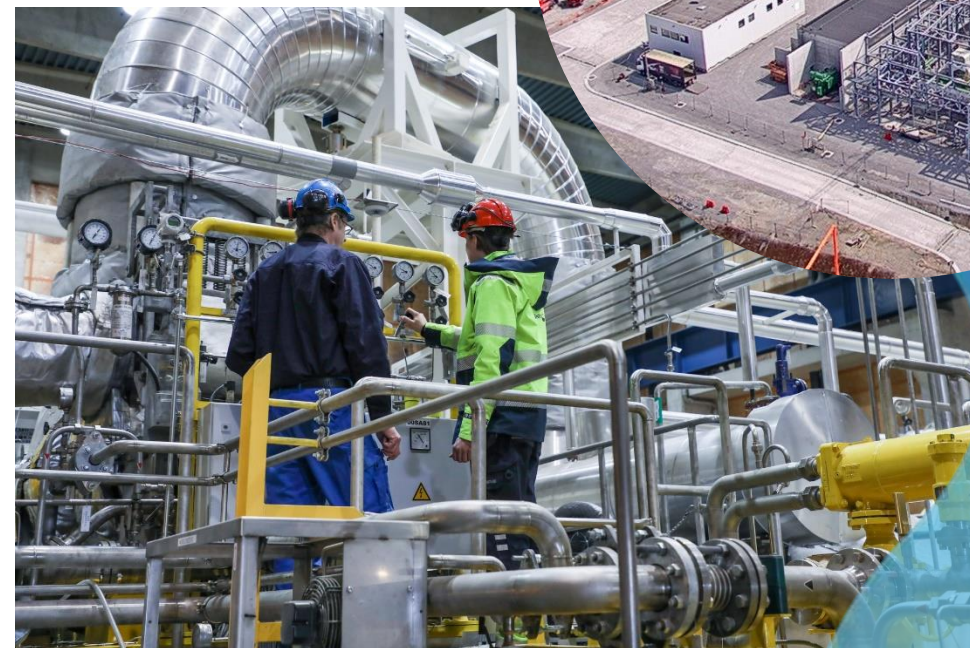
[HH](#)

HySkies

A partnership to develop Sustainable Aviation Fuel

The plant will produce around 82000 tonnes SAF and 9000 tonnes of renewable diesel per year. Fossil-free hydrogen from a 200 MW electrolyser, biogenic CO₂ captured from a waste-to-energy plant, and sustainable ethanol will be fed to a two-step process consisting of gas fermentation and alcohol-to-jet (AtJ).

The project will result in the relative avoidance of 94% of greenhouse gas emissions compared to the reference scenario over the first ten years of operation.



See more:

[HySkies](#)

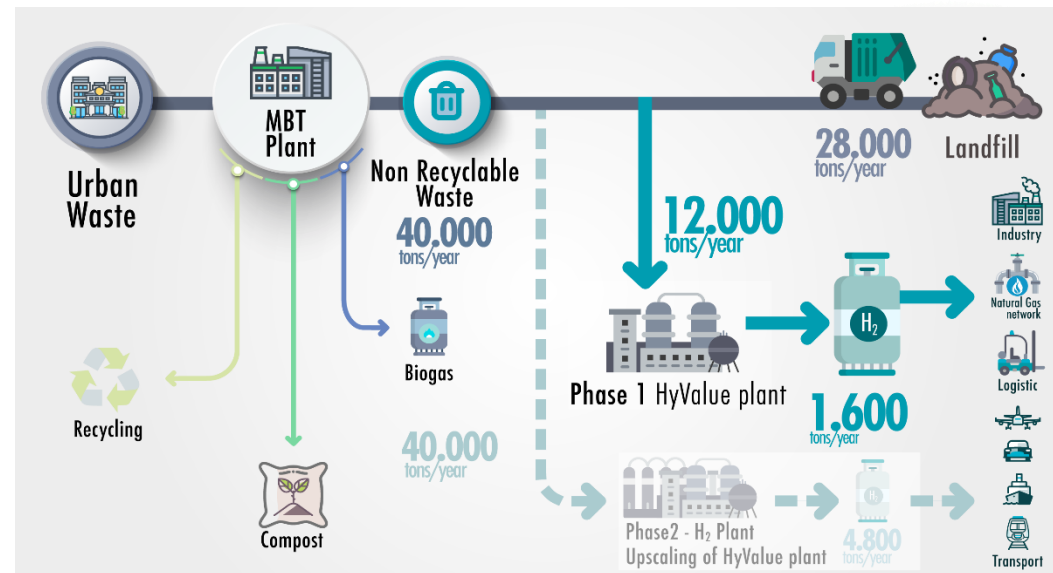


European
Commission



A novel upcycling production process, based on an innovative circular business model, for high-quality hydrogen production through urban waste streams valorisation

The HYVALUE project will produce high quality hydrogen based on an innovative production process using, amongst other, municipal solid waste. The project will annually produce 1 600 tonnes of hydrogen for the mobility and industrial sectors, using 12 000 tonnes of refuse municipal solid waste.



See more:

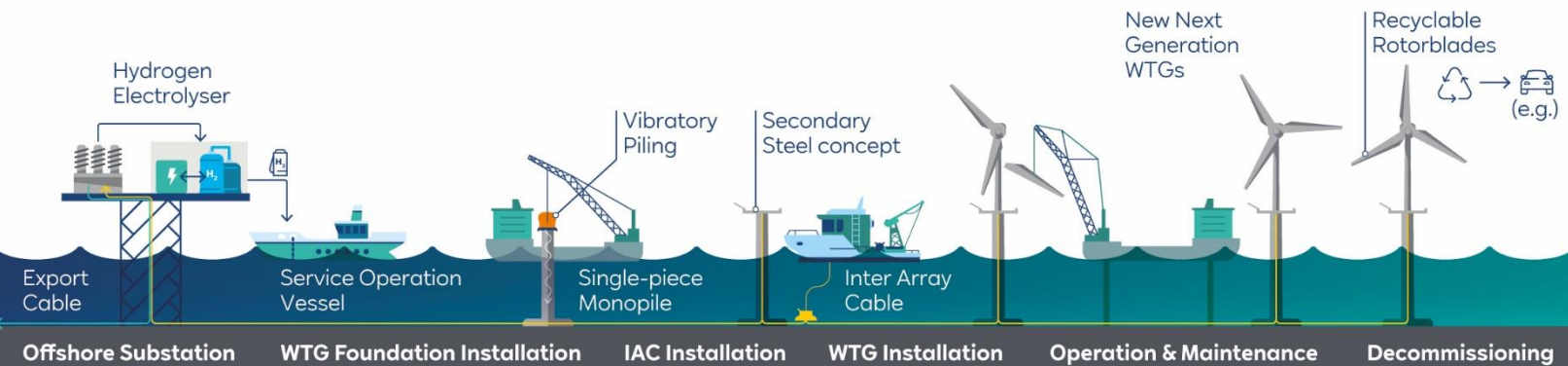
[HYVALUE](#)



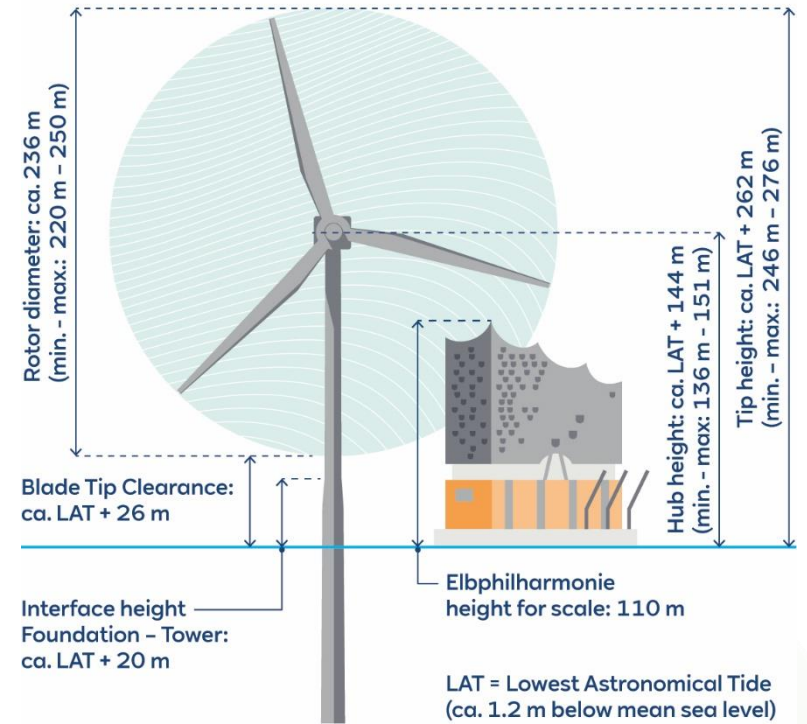
N2OWF

Green Hydrogen Project for Transport in Cyprus

The N2OWF project will build and operate a first-of-its-kind offshore wind farm, with a capacity of 450 megawatts (MW) combined with on-site production, storage, and offtake of green hydrogen. The innovative technologies include the wind turbine (approximately 15 MW each), the foundations (especially the installation of one-piece monopiles) and a hydrogen solution (combination of a 4MW electrolyser on the offshore substation and a service operation vessel running around 80% on green hydrogen) in the German North Sea.



Overview of WTG with Foundation



See more:

[N2OWF](#)

VOZARTEK

Initiating the Production of Green Hydrogen for Transport and Other Applications in the Czech Republic

The project's innovation lies in the “market initiation” ambition, and “operation optimisation” of the plant. For the latter, the combination of PV (prevalent in summer) and biomass co-generation (prevalent in winter) makes the production of hydrogen available all-year-round.

The key objective is to provide a reliable supply and guaranteed volume of green hydrogen at an affordable price in order to kick-start the market.

See more:

[VOZARTEK](#)



ZE PAK Green H₂

5 MW pilot green hydrogen production facility

The ZE PAK project aims to build a 5MW pilot water electrolysis system to produce green hydrogen for the public transport bus sector in Poland. The system is highly innovative as it contains a self-designed electrolyser stack that improves efficiency by 5% and reduces costs compared to a conventional technology.

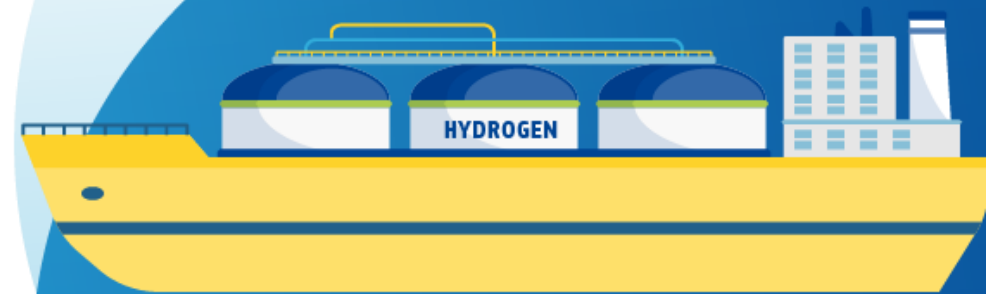
The hydrogen production capacity is expected to achieve 710 tonnes per annum (tpa) allowing to power ca. 84 buses, supporting the avoidance of 96% of greenhouse gas (GHG) emissions compared to a conventional technology.



See more:

[ZE PAK green H2](#)

Connecting Europe Facility Transport



H2F4P

Hydrogen Fuel for Paris



The H2F4P Project aims to deploy 8 large-scale Hydrogen Refuelling Stations (HRS) in the Paris area to support the market uptake of fuel cell electric vehicles (FCEV), especially taxi fleets with the aim to reach at least 5% zero-emission vehicles (e.g. approximately 2500 FCEVs).

More:

<https://www.hysetco-mobility.com/?lang=en>

[H2F4P project](#)

H2Benelux

The H2 Benelux project consists on a study with a pilot real life trial for the deployment of at least 8 Hydrogen Refuelling Stations (HRS) and the introduction of 80 Fuel Cell EVs along the BENELUX sections of the TEN-T Core Network Corridors. By doing so, it will allow to interconnect the HRS networks in the United Kingdom, France and Germany contributing to the creation a continuous network of HRS in Europe.

More:

<https://h2benelux.eu/>

[H2 Benelux project](#)



H2Bus Europe



The H2Bus Europe Project will deploy 2 Hydrogen logistic centres, one in Denmark and one in the United Kingdom.

Each Hydrogen logistic centre will serve a number of Hydrogen refuelling stations, 5 in Denmark and 4 in the UK, through tube trailers.

More:

<https://www.h2bus.eu/>

[H2 Bus Europe project](#)

H2 Corridor

The H2 Corridor project aims to decarbonise road freight transport at the southern end of the North Sea – Mediterranean TEN-T corridor by deploying a network of 8 Hydrogen Refuelling Stations (HRS) and green hydrogen production facilities, as well as a fleet of hydrogen heavy duty vehicles in the French Occitanie Region.



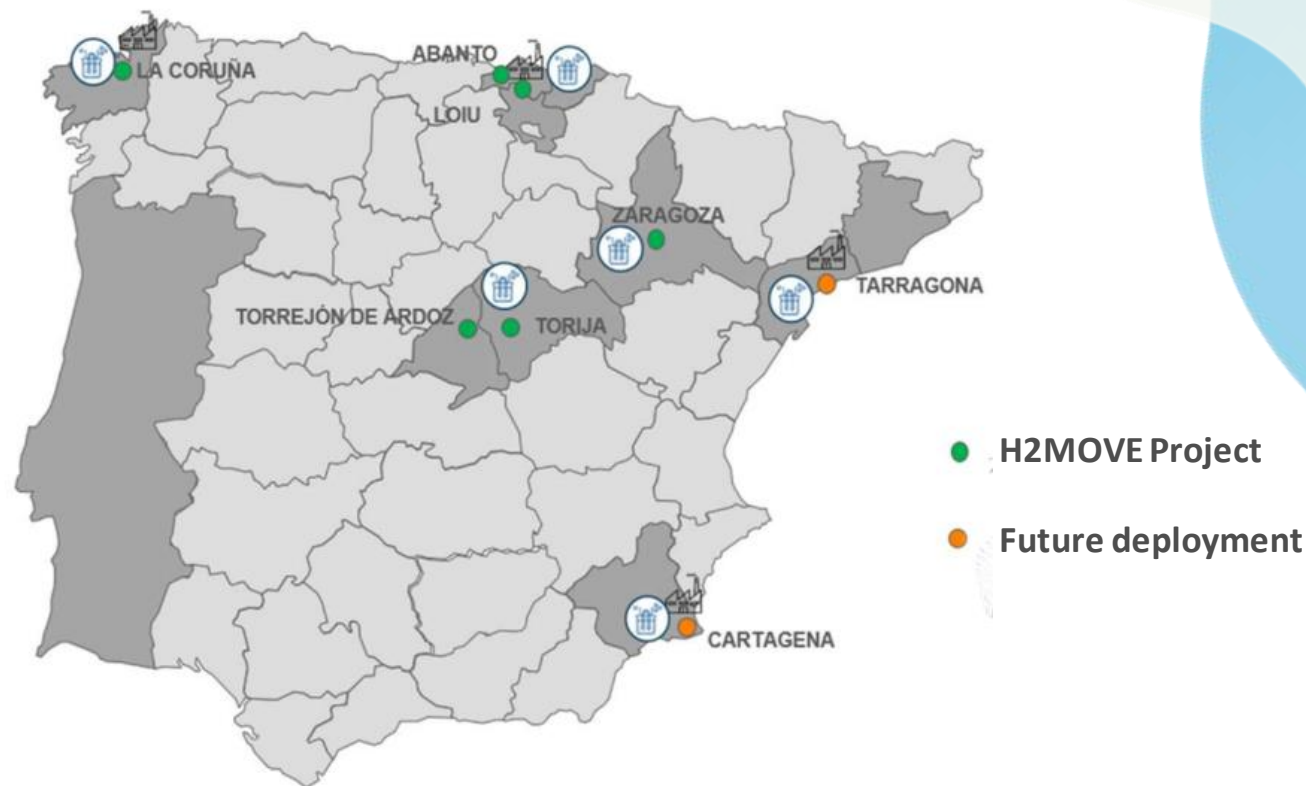
More: [H2 Corridor](#)

HY2MOVE

The HY2MOVE project consist of the deployment of six Hydrogen Refuelling Stations (HRS) in Spain along the Mediterranean and Atlantic corridors. These HRSs together with the construction of one electrolyser will contribute to the decarbonisation of the transport sector in Spain.

More:

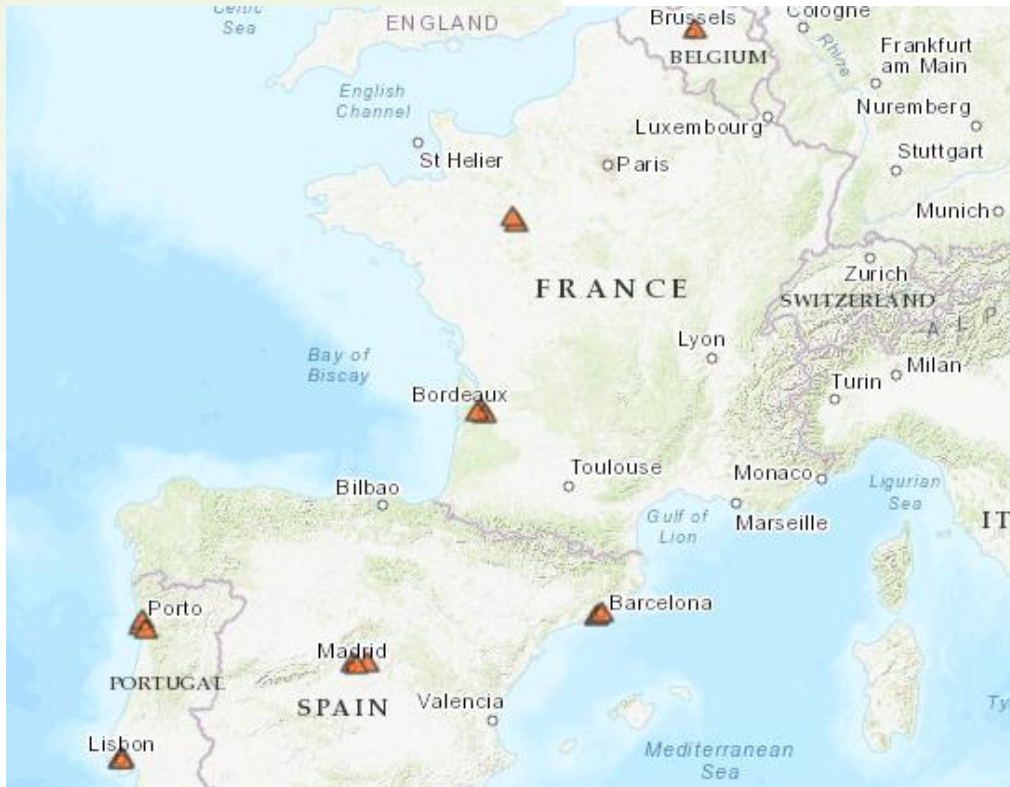
[H2MOVE project](#)



EHNbyHype

European Hydrogen Network by Hype

The EHNbyHype project aims to deploy a network of 18 Hydrogen Refueling Stations (HRS) located along the TEN-T road network, the Atlantic and North Sea-Mediterranean Corridors. 5 HRSs will be deployed in France, 1 in Belgium, 6 in Spain and 6 in Portugal. The project includes 3 electrolyzers, two in Spain and one in Portugal.



More:

[EHNbyHype project](#)

[European Hydrogen Network by Hype](#)

GREATER4H

Green Alternatives for Transport Emission Reductions – Hydrogen

The GREATER4H project consists of rolling out 12 publicly accessible Hydrogen Refuelling Stations (HRS) in three EU Member States: 4 in Germany, 4 in Denmark and 4 in Sweden. As a result, the project will contribute to creating an integrated network of HRS along the TEN-T road network and to the objective of the EU Green Deal of decarbonisation of the transport system.



More:

[GREATER4H project](#)

HNP24

Hype Network Paris 2024

The HNP24 project aims at deploying a network of 10 Hydrogen Refueling Stations (HRS) located along the TEN-T road network, in particular the Atlantic and North Sea-Mediterranean Corridors, and the core urban node of Paris. Two of the 10 HRS will each integrate and be supplied by on-site green hydrogen electrolyser production based on local renewable energy sources.



More:

[HNP24 project](#)

[Hype Network Paris 2024](#)

Upcoming opportunities and funding conditions

Call 2024-2025

- Deployment of Alternative Fuel Supply Infrastructure (Electricity and Hydrogen)
- Opening – Q1 2024
- Multiple cut-offs (2024-2025)

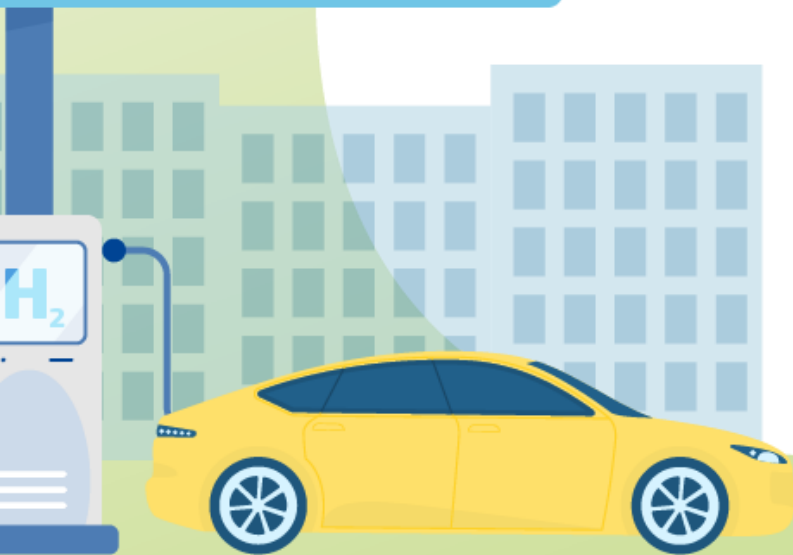
Eligibility for applying

- Blend of CEF funding and financial support from a financing institution, such as:
 - Implementing partners (EIB, EBRD, national promotional banks)
 - Non-implementing partners: commercial banks
- Financial support shall represent at least 10% of the total project investment costs

Connecting Europe Facility Energy



HYDROGEN



CEF Energy Hydrogen Projects

1 highlighted project

[CICERONE](#)



CICERONE

This study covers the environmental assessment, the market study and the engineering design needed for the construction of a renewable energy sources, electrolyser and green ammonia infrastructure to be installed and managed in Spain.

The study will develop all requested investigations, preliminary assessment, regulatory compliance requirements and design activities needed before the actual works for infrastructure development can be launched.



See more:

[CICERONE](#)

The background features a stylized illustration of renewable energy. On the left, a white wind turbine stands on a green hill. In the center, a dam with four waterfalls flows into a blue pond, with two green trees nearby. On the right, three blue solar panels are mounted on a green hill. The sky is composed of large, overlapping circles in shades of blue and light green.

Horizon Europe Transport

Horizon Europe Transport Hydrogen Projects

7 highlighted projects

[CHEK](#)

[ENDURUNS](#)

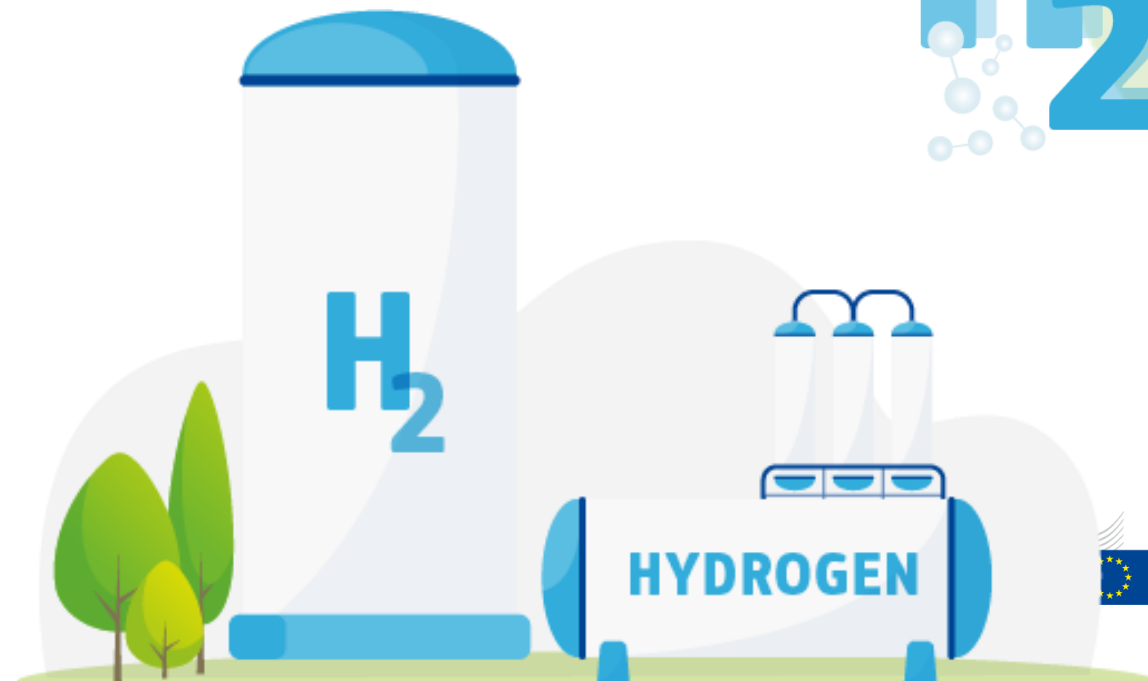
[HySeas III](#)

[NAUTILUS](#)

[STARGATE](#)

[HESTIA](#)

[OVERLEAF](#)



CHEK

Towards zero emissions shipping

The CHEK project is pioneering the development of zero-emissions shipping with a future-proof vessel design platform.

This will be used to develop and demonstrate two bespoke vessel designs in practice: a wind energy optimised bulk carrier and a hydrogen-powered cruise ship.



More:

<https://www.projectchek.eu/>

<https://www.youtube.com/watch?v=wNIWVwnChuU&t=2s>

ENDURUNS

Hydrogen fuel cell-powered AUV for ocean exploration

The ENDURUNS project has implemented an innovative hybrid design powered by hydrogen fuel cells.

The autonomous unmanned vehicle (AUV)'s operation relies on the support from an unmanned surface vehicle supplying geotagging and data transmission capability to and from the control centre onshore.



More:

<https://enduruns.eu/>

HySeas III

Blueprint for Europe's first hydrogen-powered seagoing ferry

The HySeas III project developed an advanced concept and prototype for what could become Europe's first fuel cell-driven seagoing ferry.

It also demonstrated a novel circular economy model for the local production of hydrogen fuel that could transform the coastal and island economies around Europe.



More:

<https://www.hyseas3.eu/>

<https://www.youtube.com/watch?v=h3YqcaDtrOM>

Nautilus

Sustainable long-haul passenger ships

The Nautilus project is developing an integrated marine hybrid energy system for long-haul cruise ships. The project focuses on the development of a low-emission energy system for large passenger ships.

The project will build a pilot technology that will gradually replace the internal combustion engine-based generators with a solid oxide fuel cell-battery hybrid genset.



More:

<https://nautilus-project.eu/>

<https://www.youtube.com/watch?v=uDIkhk-XfaE&t=10s>

STARGATE

Innovative solutions for sustainable airports

The aim of the STARGATE project is to develop, test and implement innovative solutions that make the airport ecosystem more sustainable, including sustainable aviation fuels like hydrogen and use of hydrogen vehicles for ground handling operations.

It will offer specific short- and medium-term green solutions for European airports at the level of day-to-day operations.



More:

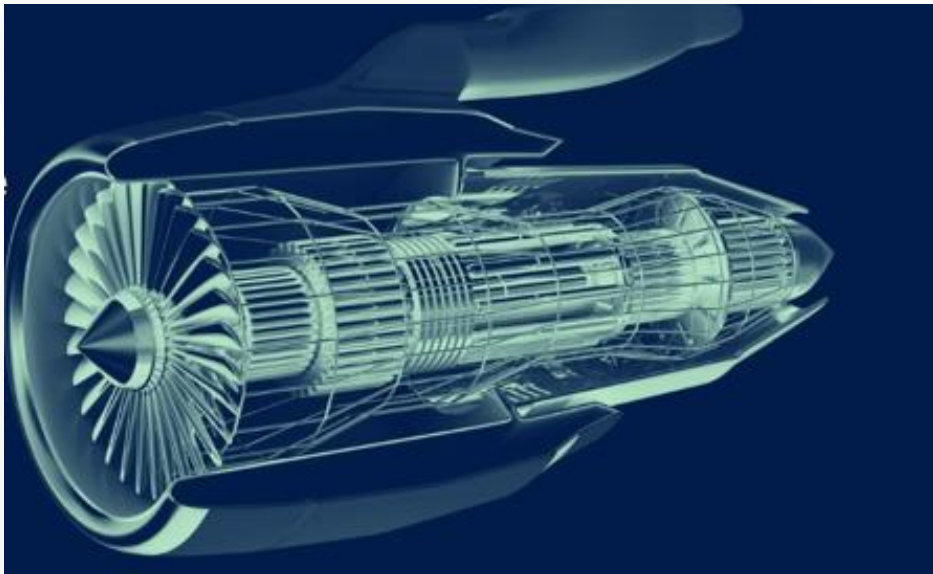
<https://www.greendealstargate.eu/>

HESTIA

Reducing the climate impact of aviation

The HESTIA project is investigating the physical phenomena related to hydrogen-air combustion of future hydrogen-powered aero engines.

Experimental activities will be complemented by theoretical and numerical work. This will focus on adapting or developing new models ready for integration into industrial computational fluid dynamics code, and the development of hydrogen combustion systems up to TRL3.



More:

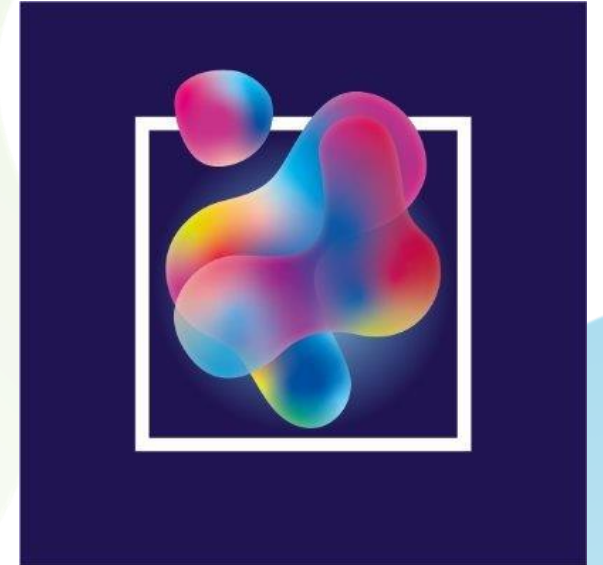
<https://www.hestia-project.eu/>

OVERLEAF

Better hydrogen storage to make air travel greener

The OVERLEAF project is developing a design that utilises innovative materials to develop an innovative liquid hydrogen storage tank. This tank will seamlessly integrate with an aircraft's fuselage and structure, while simultaneously achieving a gravimetric index of approximately 50% for 500 kilograms of hydrogen.

This high energy-to-mass ratio will make the transition to hydrogen-powered flight viable for the first time and help achieve the European Green Deal by lowering the environmental burden of air travel.



More:

<https://overleaf-project.eu/>

The background features a stylized illustration of renewable energy. On the left, a white wind turbine with three blades is partially visible. In the center, a dam with four waterfalls flows into a blue pool. To the right, three blue solar panels are mounted on a green hill. The sky is composed of large, overlapping circles in shades of blue and light green.

Horizon Europe Energy

Horizon Europe Energy Hydrogen Projects

8 highlighted projects

[Bio-FlexGen](#)

[FuelSOME](#)

[TRANSITION](#)

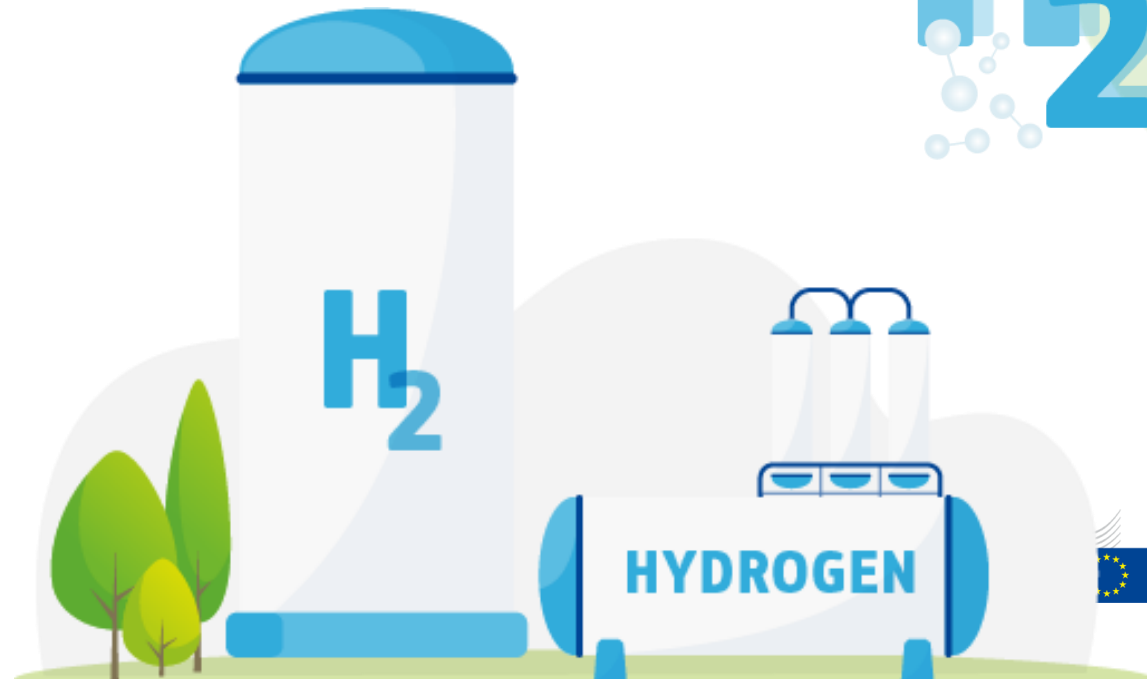
[MOF2H2](#)

[SOLARX](#)

[FreeHydroCells](#)

[H2Heat](#)

[HYFLEXPOWER](#)





Bio-FlexGen is increasing the efficiency and flexibility of **gas turbine-based combined heat and power** thanks to the use of **green hydrogen and biomass** gasification

Research and innovation action to validate the technology in relevant environment (TRL5)

See more:

<https://bioflexgen.eu/>

<https://youtu.be/EHjpH432XH8>

FuelSOME is developing **multi-fuel** solid oxide fuel cells for powering **marine shipping** vessels using ammonia, methanol, **hydrogen** and their mixtures

Research and innovation action to validate the technology in laboratory environment (TRL4)

See more:

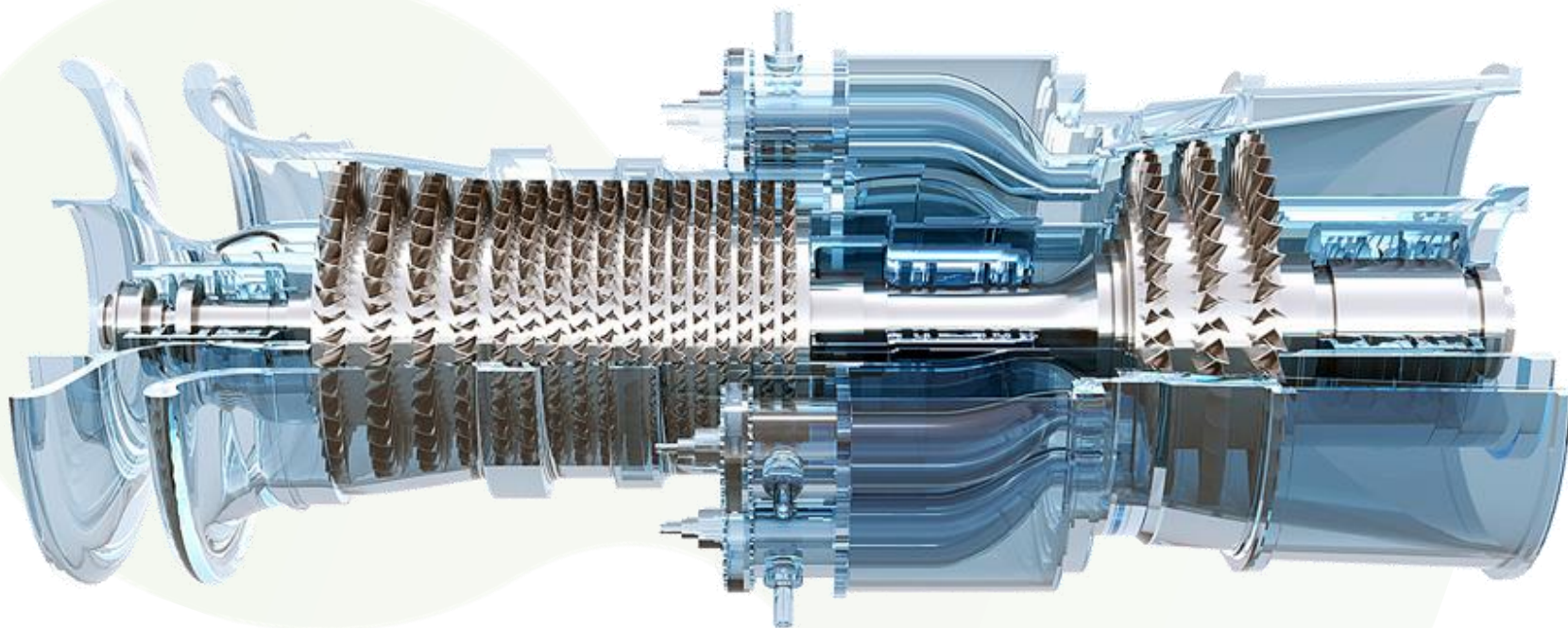
<https://fuelsome.eu/>



TRANSITION

TRANSITION is developing advanced **hydrogen-assisted combustion** technologies for **carbon-neutral** energy generation from **natural gas-fired power plants** using gas turbines

Research and innovation action to validate the technology in laboratory environment (TRL4)



See more:

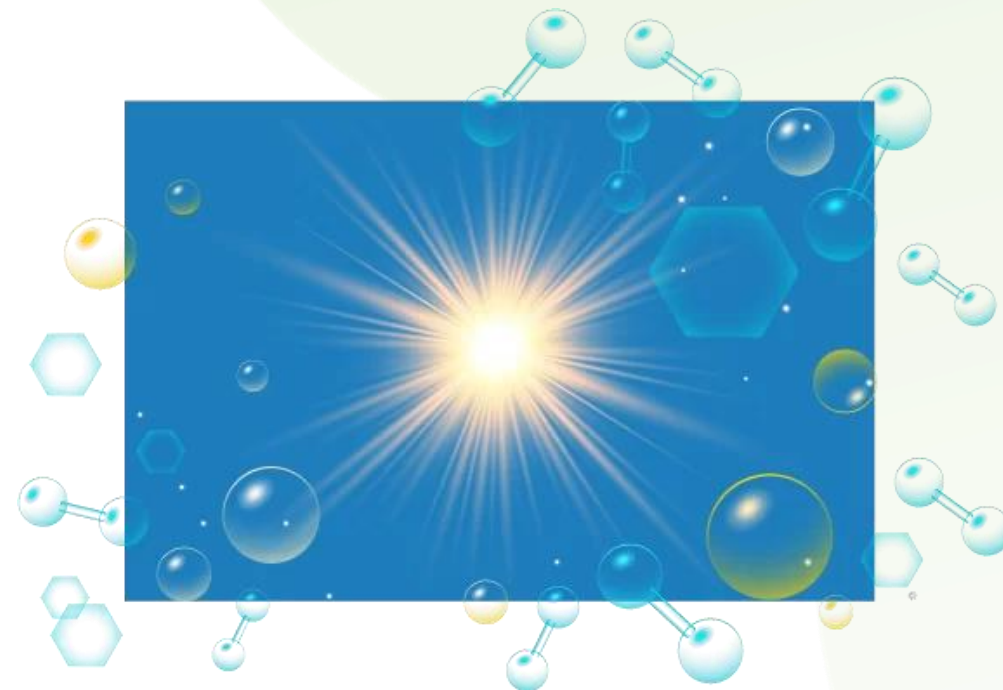
<https://transition-horizon.eu/>



MOF2H2

MOF2H2 is developing an innovative **water splitting** technology for **sun-driven clean hydrogen production using metal-organic frameworks** as photocatalysts

Research and innovation action to validate the technology in laboratory environment (TRL4)



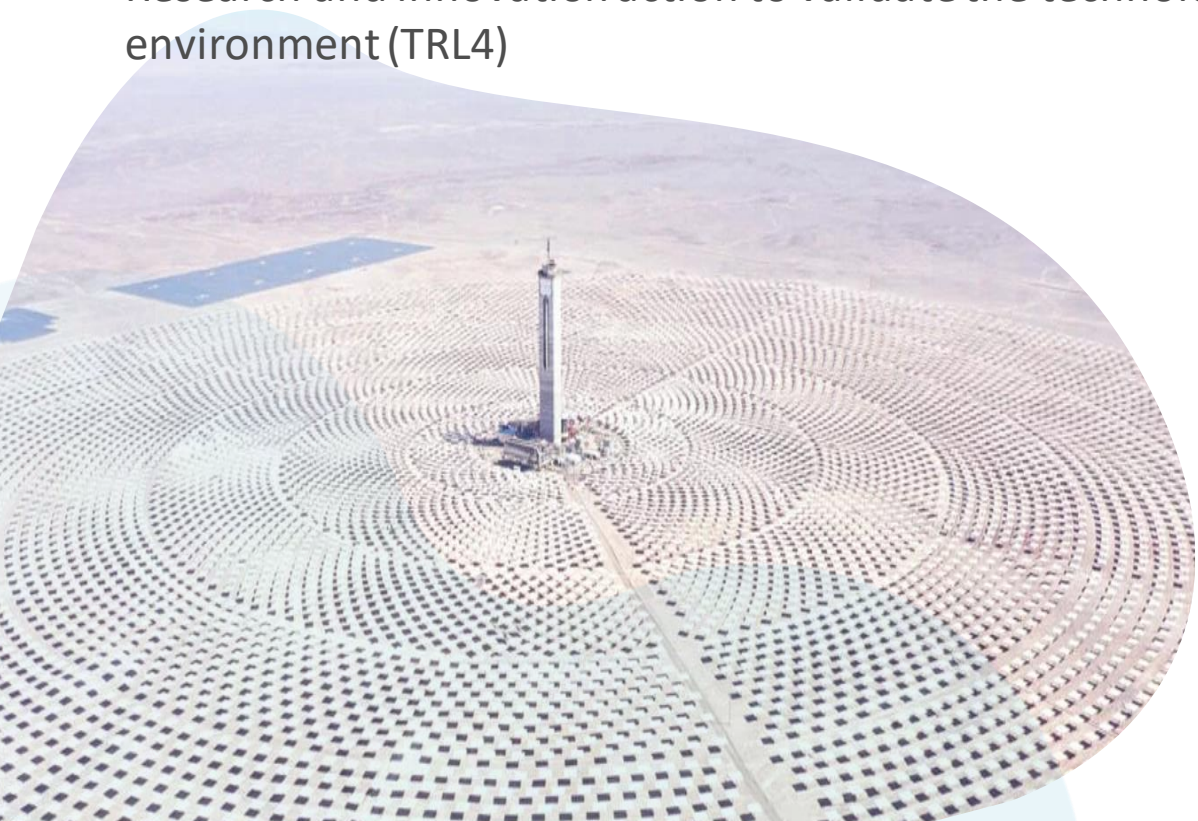
See more:

<https://mof2h2.eu/>



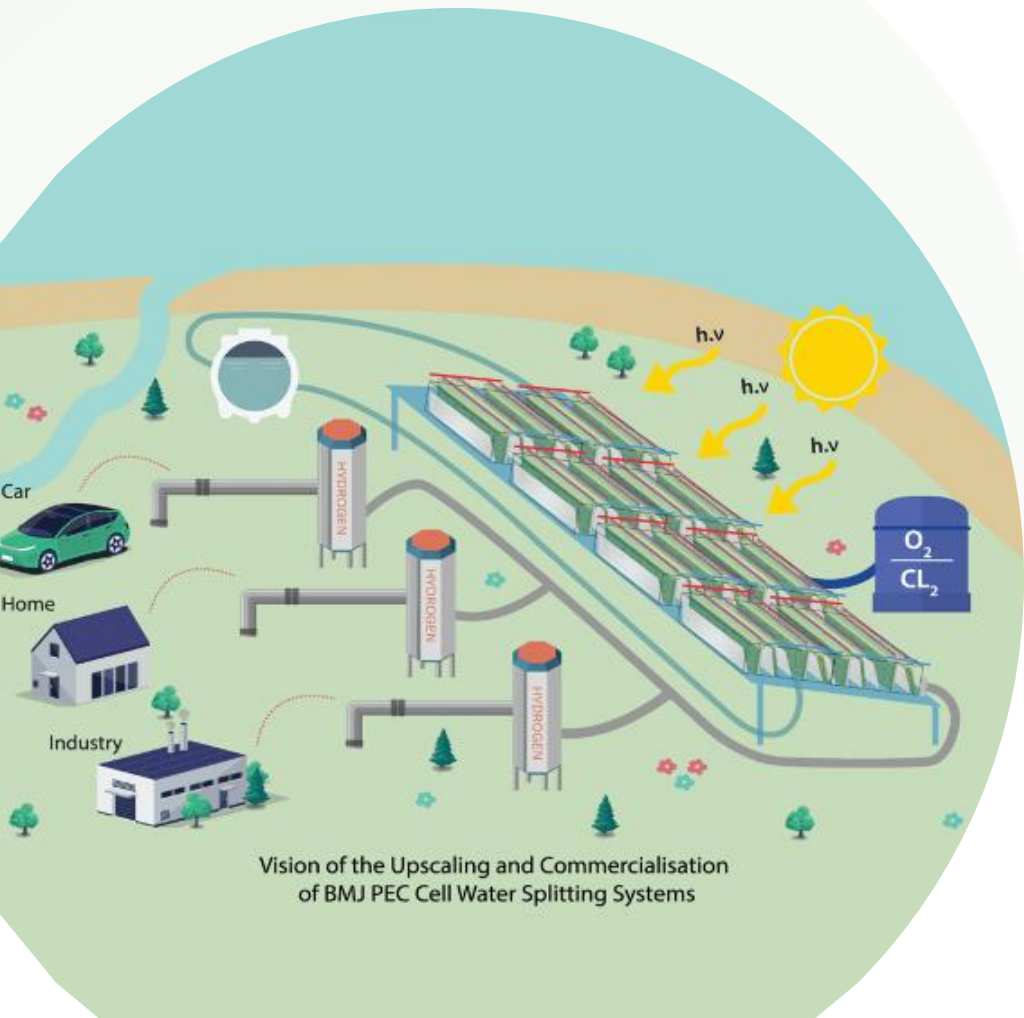
SOLARX is developing the **synergetic** efficient **production** of heat, electricity and **hydrogen** from **solar energy** in a single facility

Research and innovation action to validate the technology in laboratory environment (TRL4)



See more:

<https://solarx-project.eu/>



Vision of the Upscaling and Commercialisation
of BMJ PEC Cell Water Splitting Systems

FreeHydroCells is developing an innovative system to **split water photoelectrochemically** using **solar energy** by arraying cascades of nanometre-thick **semiconducting materials** (p-n junctions)

Research and innovation action to validate the technology in laboratory environment (TRL4)

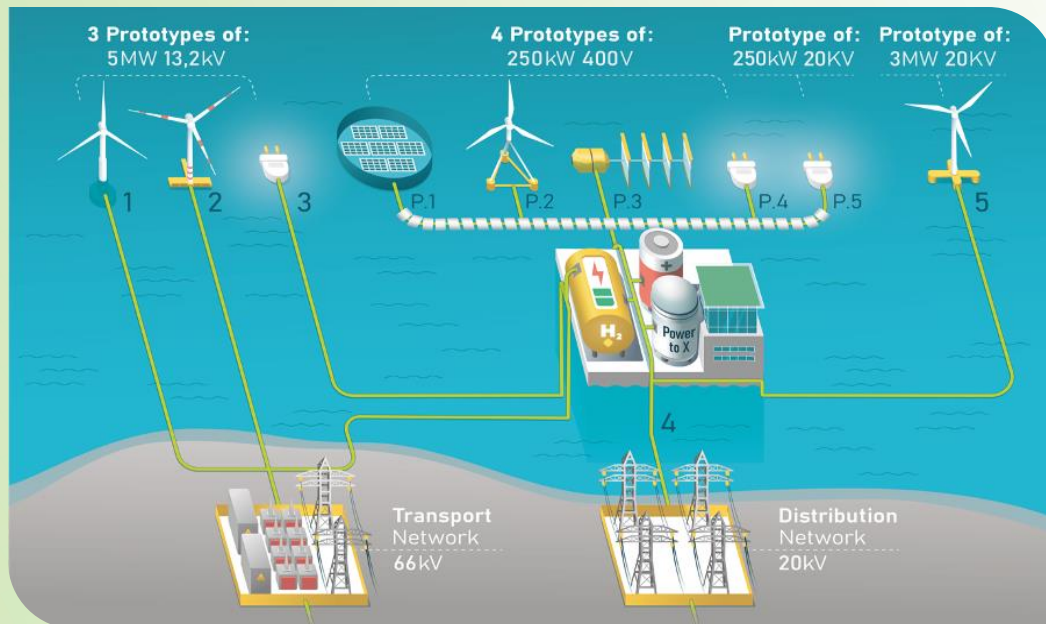
See more:

<https://freehydrocells.eu/>



H2Heat is demonstrating the full green **hydrogen value chain for heating**, from production using offshore wind up to use in **commercial buildings**

Innovation action to demonstrate a system prototype in operational environment (TRL7)



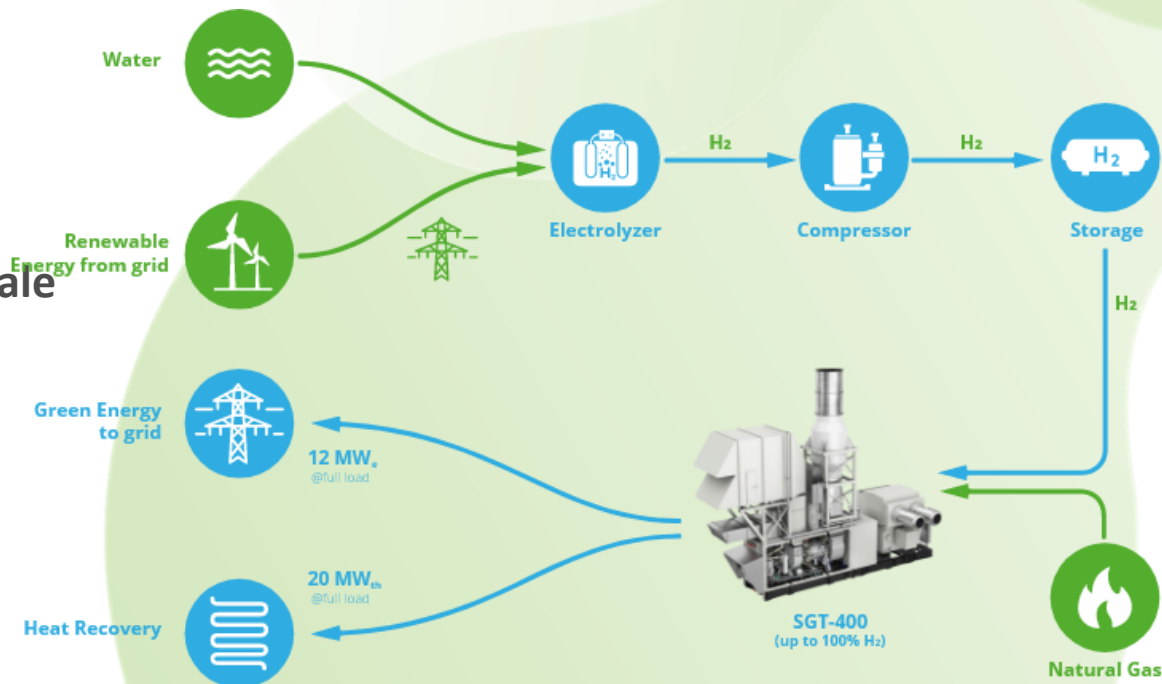
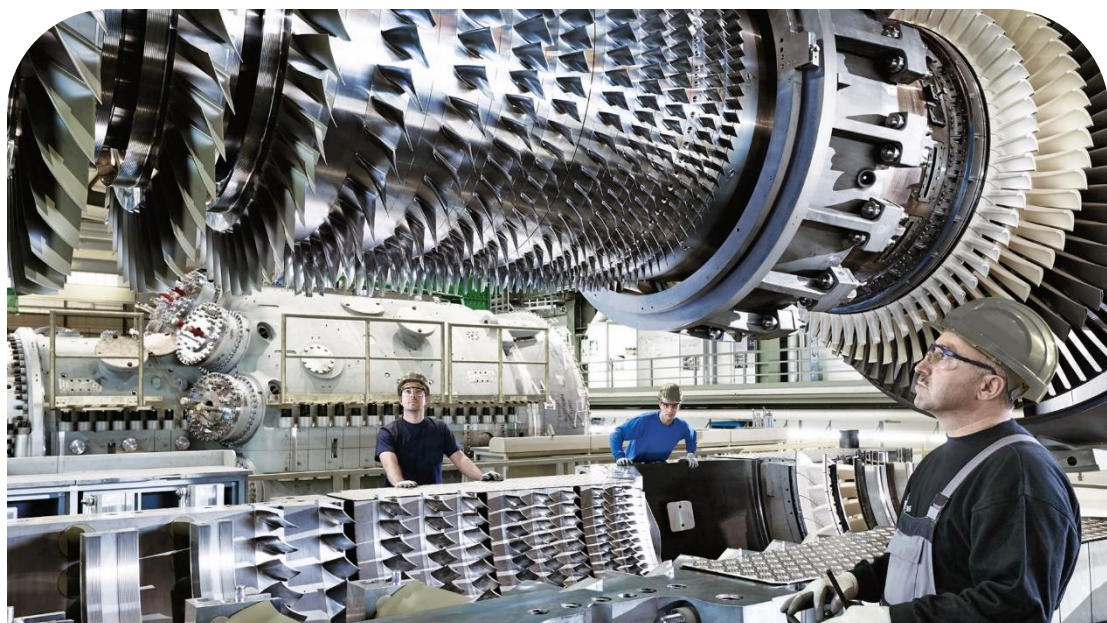
See more:

<https://h2-heat.eu/>



HYFLEXPOWER is developing the world's first **industrial-scale power-to-X-to-power** demonstrator with an advanced **hydrogen turbine**

Innovation action to demonstrate a system prototype in operational environment (TRL7)



See more:

<https://www.hyflexpower.eu/>

The background features a stylized illustration of renewable energy. On the left, a white wind turbine stands on a green hill. In the center, a dam with four waterfalls flows into a blue pond, with two green trees nearby. On the right, three blue solar panels are mounted on a green hill. The sky is composed of large, overlapping circles in shades of blue and light green.

Horizon Europe Climate

Horizon Europe Climate Hydrogen Projects

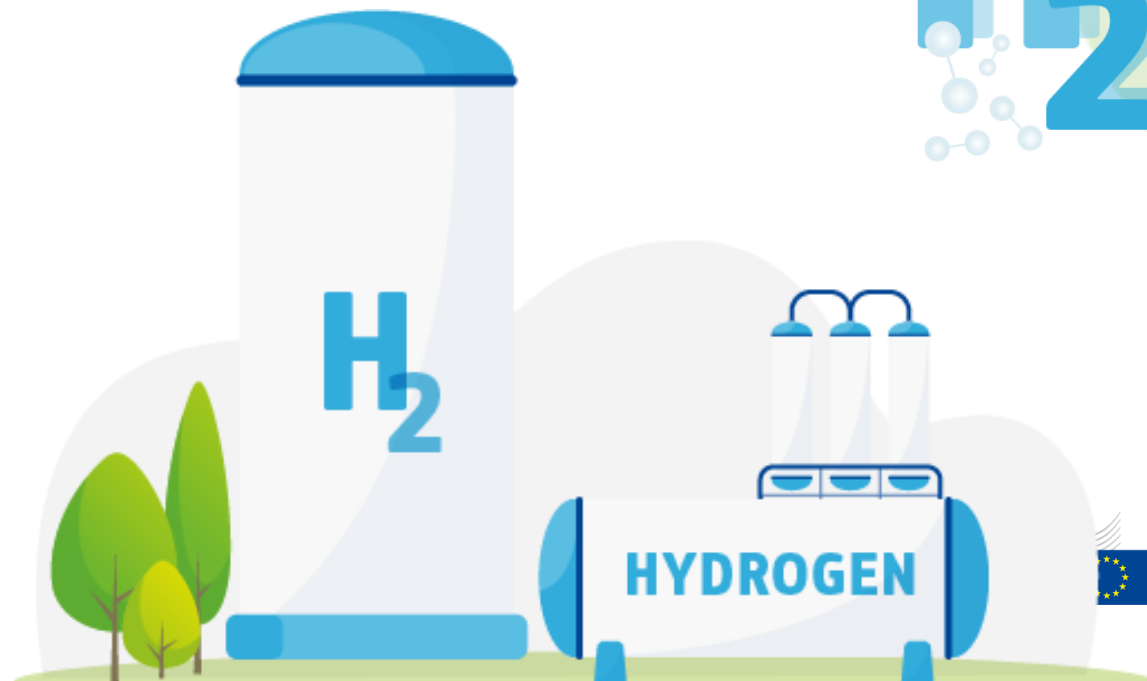
3 highlighted projects

COLDSPARK

HYDRA

STORMING

TITAN

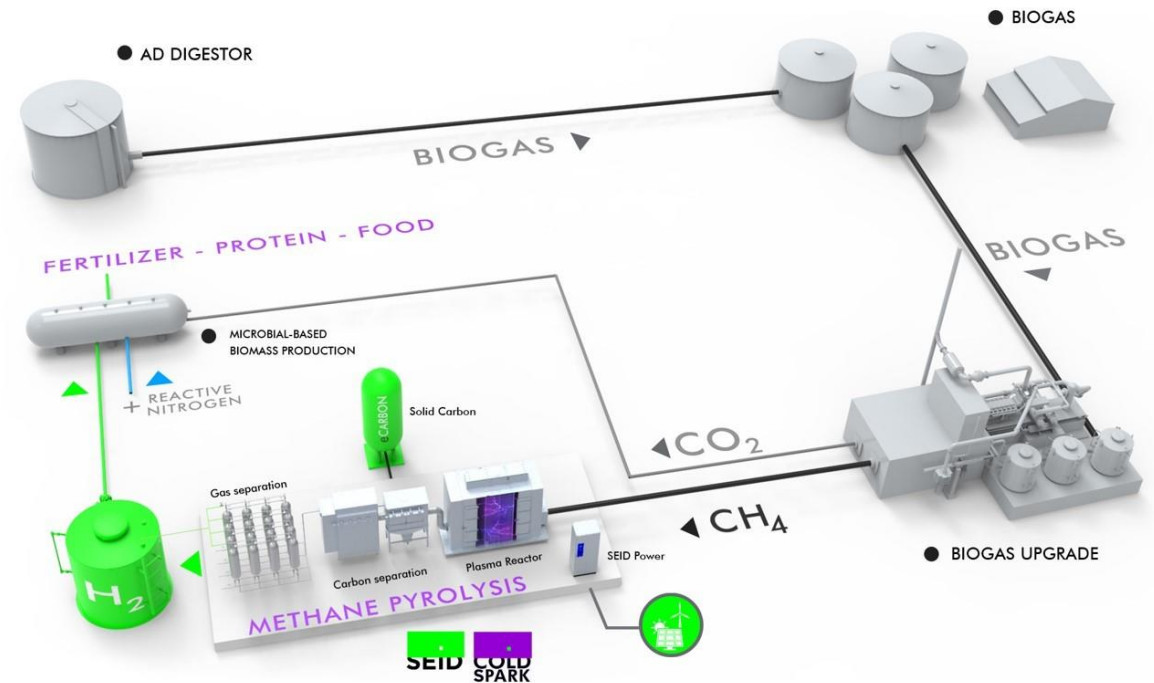


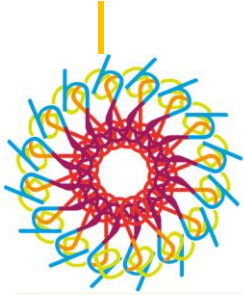
COLD SPARK

The project will develop and test a novel plasma reactor for production of hydrogen, alongside high-value carbon, at a low energy cost (< 15 kWh/kg H₂ produced) without the need for catalysts and water.

See more:

<https://coldspark.eu/>





hydra

Expected Impacts

Environment, emissions and energy

HYDRA will provide energy, socio-economic and emission scenarios, including the possible effects on the environment (e.g. land use and water consumption).

Climate

HYDRA will assess the climatic impacts of the hydrogen economy by analysing how increasing hydrogen emissions could affect the atmospheric composition, water vapour, the ozone layer, and the radiative forcing.

Safety

HYDRA will develop a monitoring system to detect and prevent hydrogen leakages to increase safety of hydrogen technologies.

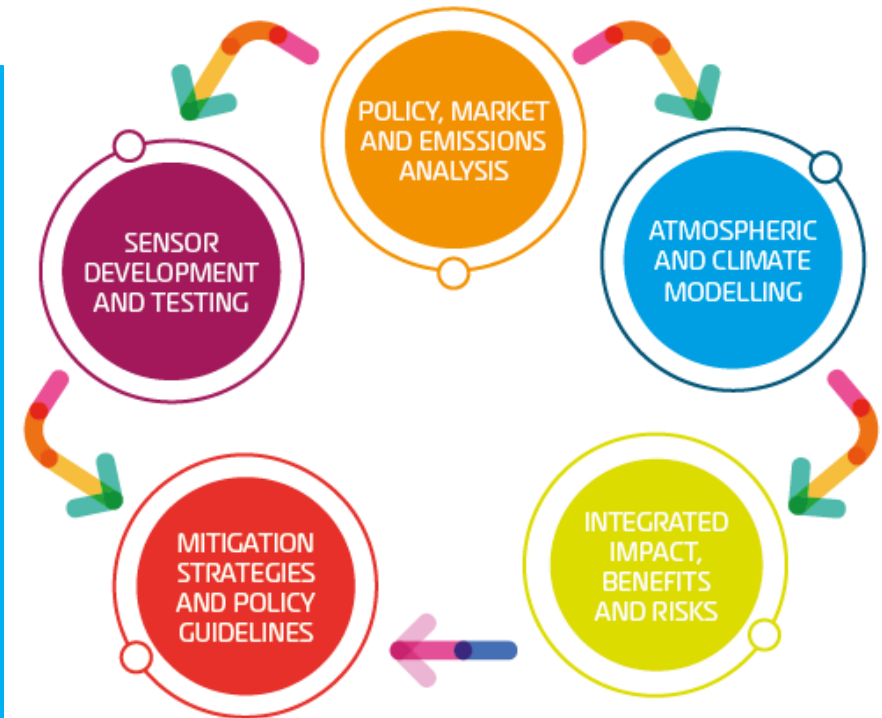
Sustainability

HYDRA will update the LCA methodology to take into account potential environmental impacts of hydrogen technologies.

Policy

HYDRA will assess risks and benefits of a large-scale hydrogen economy, considering climatic and socio-economic factors, and provide mitigation actions and guidelines for policymakers.

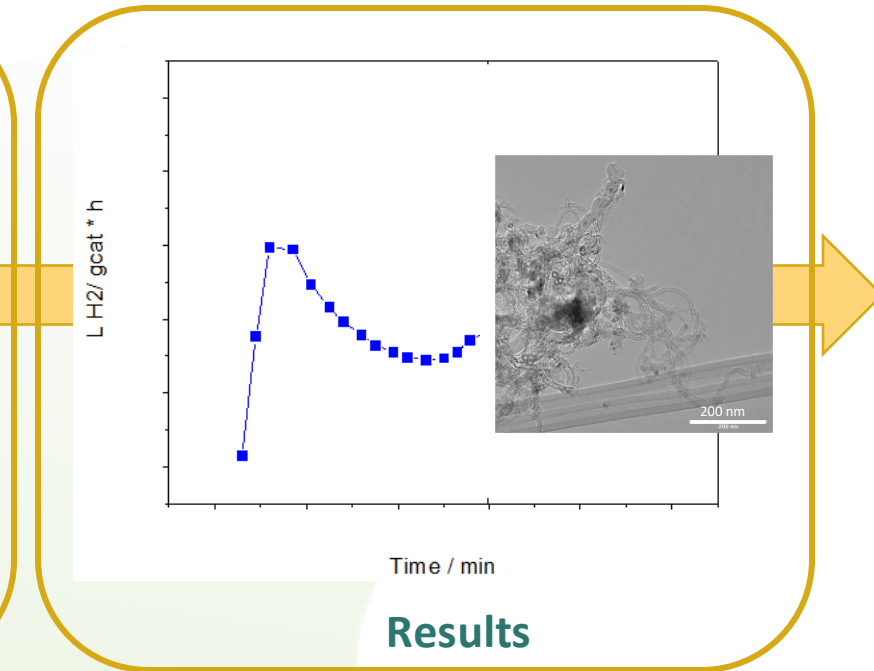
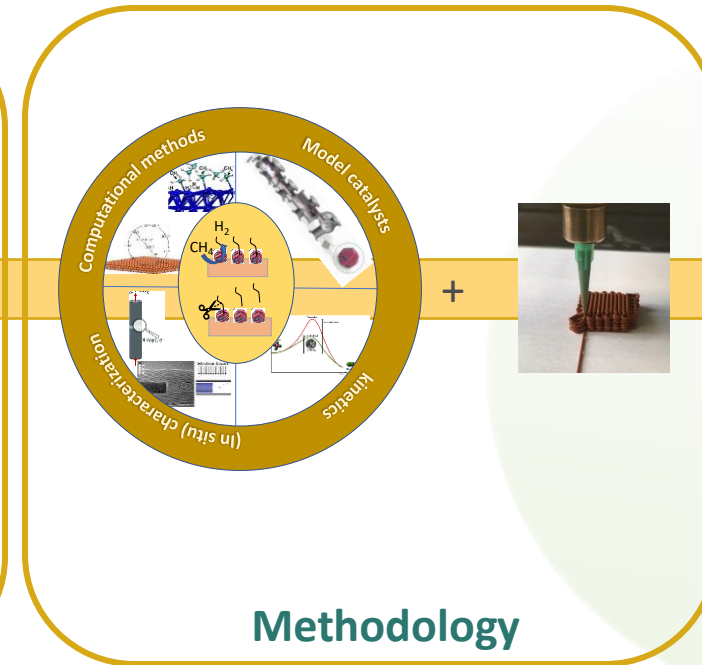
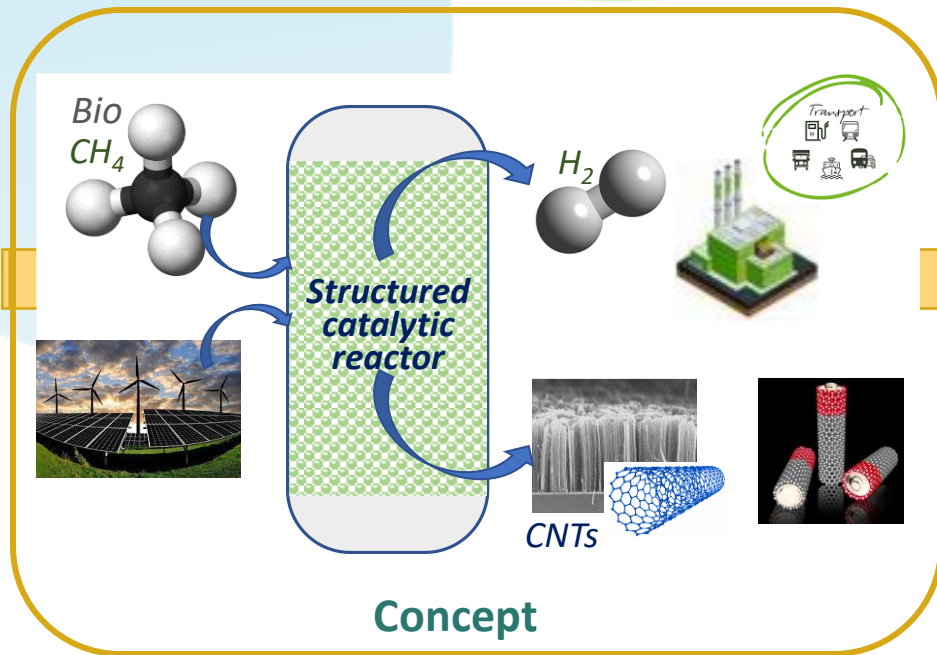
Methodology



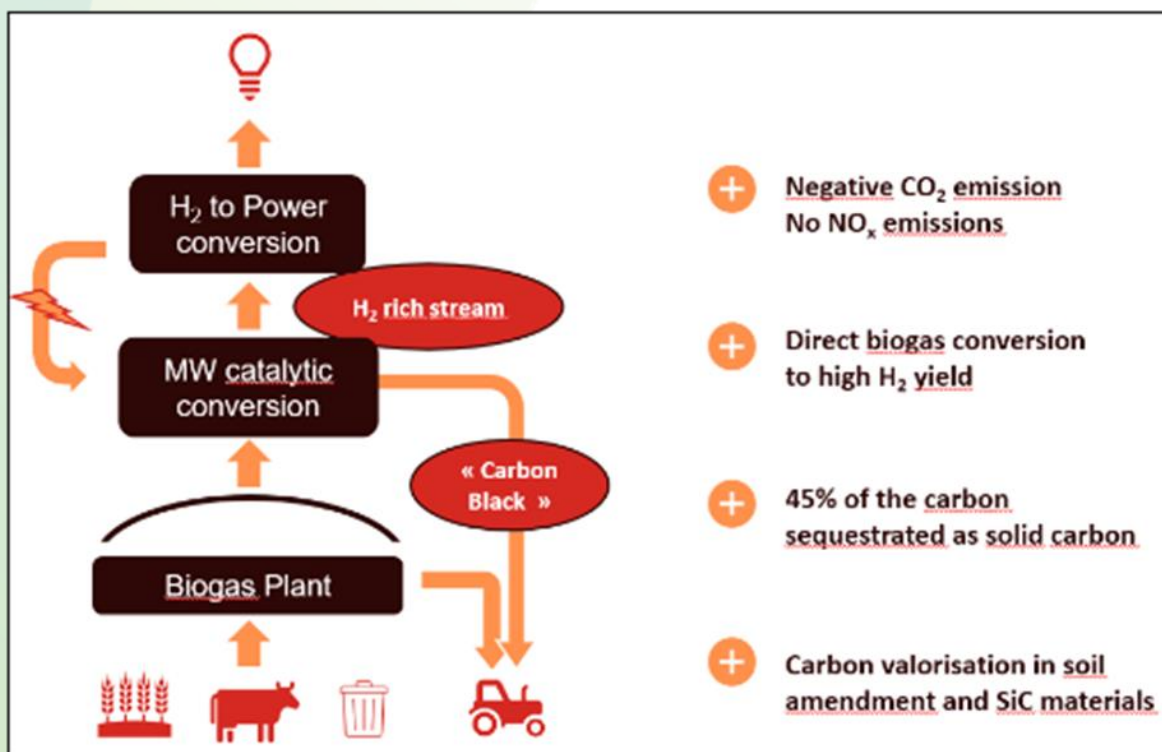
Structured unconventional reactors for CO₂-free Methane catalytic cracking

See more:

<https://storming-project.eu/>



Direct biogas conversion to green hydrogen and carbon materials by scalable microwave heated catalytic reactor for soil amendment and silicon carbide production



See more:

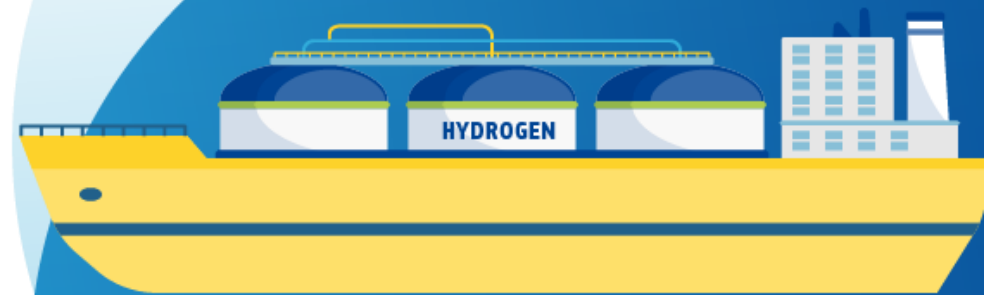
<https://cordis.europa.eu/project/id/101069474>

The European project TITAN develops an innovative microwave heated catalytic reactor which will convert directly biogas into hydrogen without greenhouse gases.

Thanks to major expenditure reductions and process efficiency, TITAN will yield H₂ at competitive cost.

The co-produced carbon material may be used for soil amendment nearby delocalised biogas plants, allowing long term carbon sequestration and a sustainable circular economy.

LIFE



LIFE Programme

Hydrogen Projects

6 highlighted projects

[HYFLEXPOWER](#)

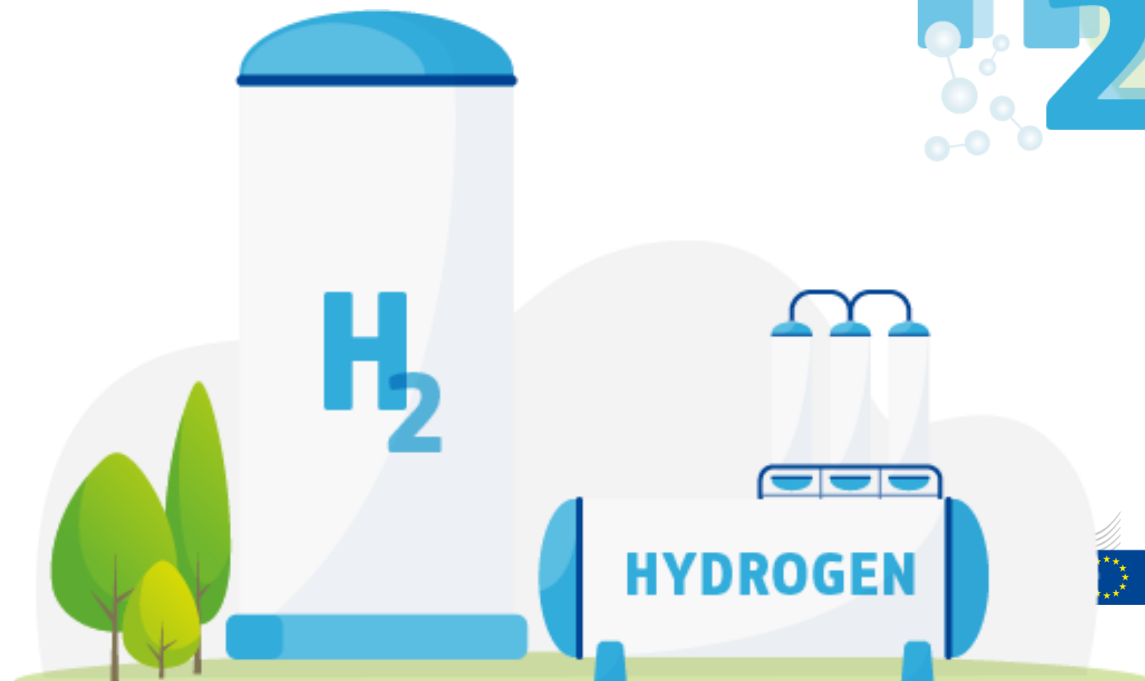
[Lifezeroenergymod](#)

[LIFENEWHYTS](#)

[Lifeandgrabhy](#)

[LIFEOCEAN](#)

[LIFEalps-IPzero](#)



LIFE ZeroEnergyMod

See more:

<https://lifezeroenergymod.eu>

LIFE ZEROENERGYMOD project aims to develop a robust, easy-to-install, easy-to-transport, low consumption and zero emissions solution for habitable modules which will be able to be used under extreme weather conditions.

The zero emissions solution will be formed by two connected solutions, the PASSIVMOD, a low-consumption habitable module designed under Passivhaus standard, and the ENERMOD, which will provide renewable energy and energy storage to the habitable module.

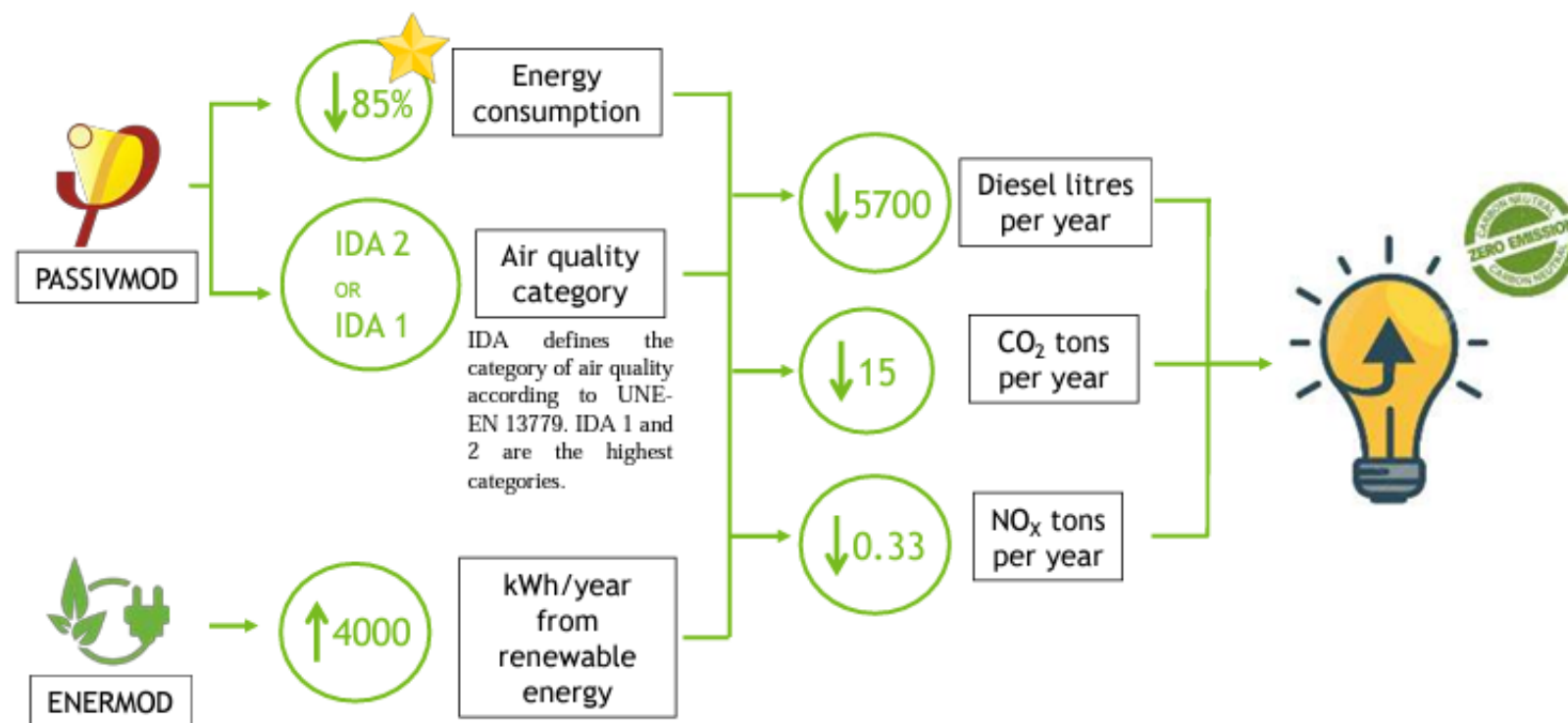


LIFE ZeroEnergyMod

Project impact

See more:

<https://lifezeroenergymod.eu>



LIFE ZeroEnergyMod

See more:

<https://lifezeroenergymod.eu>

Replicability

The project solution is developed under a complete and adaptable design which gives it the potential to be applied in **different sectors and situations**. The design is focused on being easy-to-transport, easy-to-install, low consumption and zero emissions, so that many implementations can be developed in a **future industrial replication**.



Army campsites

Emergency facilities or field hospitals



Schools

Temporary habitable solutions

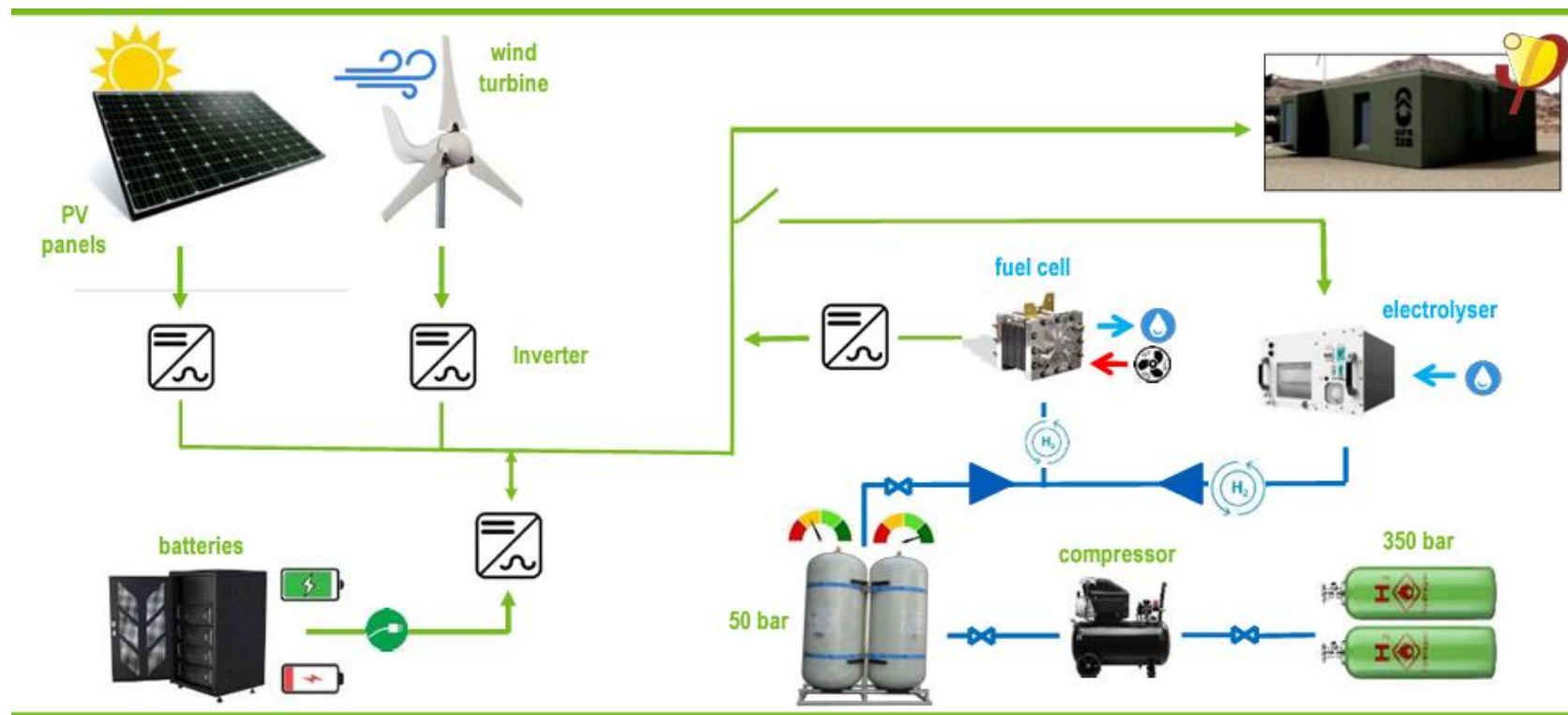


LIFE ZeroEnergyMod

Solution. ENERMOD

See more:

<https://lifezeroenergymod.eu>



LIFE NEW HYTS

LIFE NEW HYTS is coordinated by KWR Water B.V. (Netherlands) and shows how the transition to a climate-neutral transport sector has already started. The project is a unique collaboration between local businesses, knowledge institutions and governments. It demonstrates the possibilities and feasibility for local production, distribution and application of green hydrogen in road transport. LIFE NEW HYTS develops conditions for the rapid introduction of green hydrogen-powered heavy-duty commercial vehicles.

See more:

<https://lifenewhyts.eu/en/>



LIFE NEW HYTS

See more:

<https://lifenewhyts.eu/en/>

LIFE NEW HYTS demonstration project, reNEWable HYdrogen for TranSport



LIFE NEW HYTS



See more:

<https://lifenewhyts.eu/en/>

The project provides the province of Utrecht with valuable data on the use and costs of green hydrogen and offers practical support for the accelerated implementation of green hydrogen in transport. Utrecht province has developed a Hydrogen Covenant, which aims to boost hydrogen mobility in the region and will expand this for the transport sector as part of this project.

The knowledge is shared with other municipalities in the province, and with the regions of Bruges in Belgium and North Rhine-Westphalia in Germany.

LIFE 'N Grab HY

The LIFE 'N Grab HY! project replaced two diesel-fuelled refuse trucks: one replacement was a new diesel truck purchased by the associated beneficiary, that the project team converted into a hydrogen-electric vehicle. The other vehicle comprised an upcycled second-hand chassis provided by the associated beneficiary CURE. This vehicle also got a hydrogen-electric driveline, hydrogen storage tanks and its waste lifting arm had to be refurbished. This truck was operated by associated beneficiary CURE.

See more:

<https://www.lifeandgrabhy.eu/>



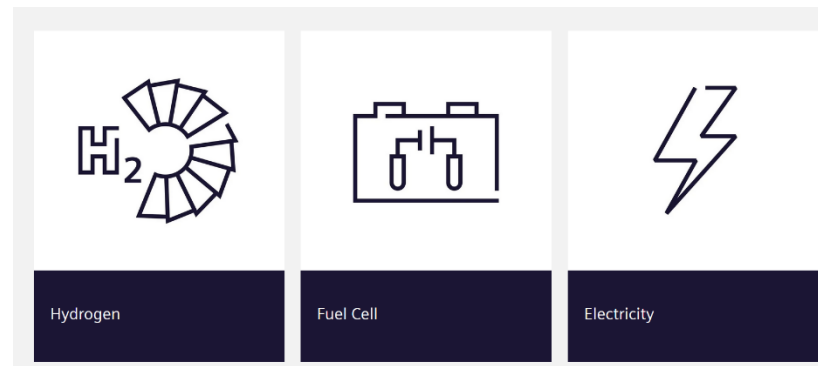
LIFE OCEAN

New solutions to reduce the environmental impact of the shipping industry

The aim of the LIFE OCEAN (onboard clean energy and no-noise) project is to substitute the traditional diesel generators used to cover the hotel loads of a Sanlorenzo superyacht with a methanol-based fuel cell system. Along with air pollution mitigation, on board noise will be abated while underwater noise will be reduced thanks to the elimination of diesel generators. The solution adopted constitutes a zero-carbon technology for the maritime sector, adopting green methanol whose large capacity production is growing at both EU and extra-EU level.

See more:

[LIFE OCEAN](#)



LIFEalps-IP ZERO

See more:

<https://www.life-alps.eu/>

The LIFEalps-IP ZERO project is coordinated by SASA AG (public transport - Italy) and aims to be a catalyst for the development of a fully zero-emission road transport and mobility system across the South Tyrol region, along the Brenner corridor and in neighbouring regions. This will be the location of the Winter Olympic Games in 2026.

Partners from different areas of South Tyrol joined forces to develop the infrastructure for e-mobility, to bring pilot fleets on the streets and to create zero emission services (e.g. taxi, shuttle service, transport of goods).



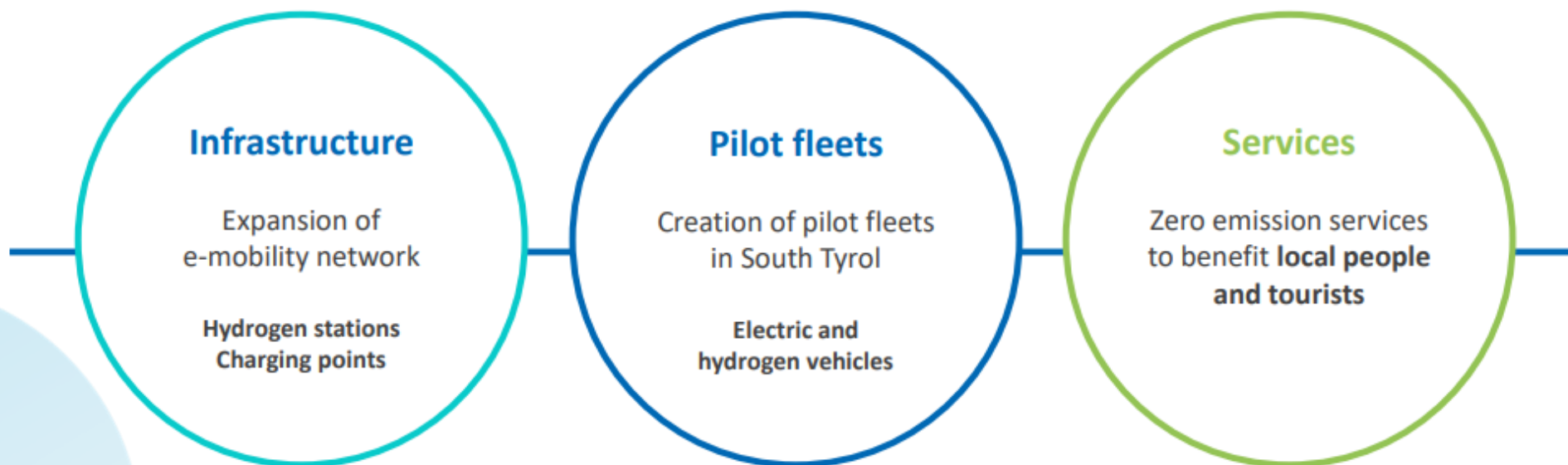
LIFEalps-IP ZERO

See more:

<https://www.life-alps.eu/>



ZERO EMISSION MOBILITY IN THE ALPS



LIFEalps-IP ZERO

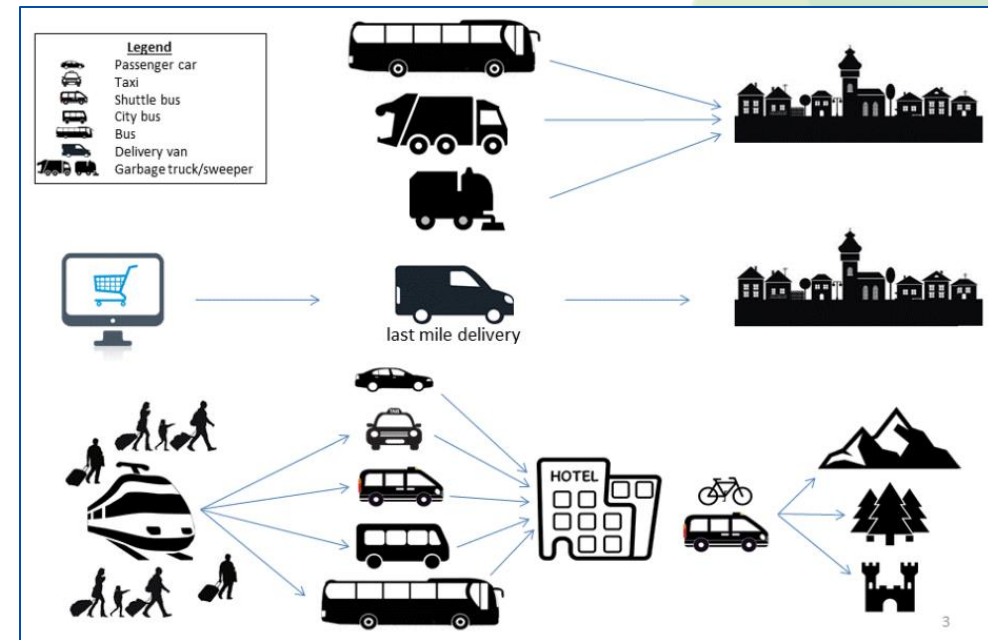
The project aims to improve traffic emissions. It foresees promotion of the use of public transportation for tourists, it aims to enhance the use of car sharing and bike mobility. The objectives are pursued mainly through awareness raising activities.

The core of the project is designed to improve traffic towards zero emissions by:

1. Developing infrastructures for the recharge of electric vehicles and – if necessary - upgrade the existing grid.
2. Implementing a local production of hydrogen from renewable energy sources (green hydrogen) and set up hydrogen refuelling stations (HRSs) for private and public vehicles.
3. Introducing and fostering the use of electric and fuel cell public vehicles such as urban buses.

See more:

<https://www.life-alps.eu/>



For more information on EU funding programmes and projects, please visit our website and CINEA's public projects dashboard.



CINEA's website

<https://europa.eu/!vQ78wg>



CINEA public dashboard

<https://europa.eu/!hGfgWY>

