



# Project Brochure

## Introducing HUGE

The ambition of the HUGE project is to raise awareness of the use of green hydrogen as a viable energy vector for remote and rural communities in housing, transport, and industry.

Whilst many communities in the Northern Periphery and Arctic Programme Area are challenged by low economic diversity, result of their peripheral locations, dispersed demography and lack of critical mass, they have abundant amounts of renewable energy resources available locally.

The HUGE project aims:

- To provide communities with energy security and self sufficiency through increasing awareness and facilitating uptake of hydrogen utilization from excess renewable energy.
- To increase the awareness of hydrogen as a viable energy option for a variety of end uses in the public infrastructure domain housing, transport and industry.
- To facilitate the decision making and implementation of hydrogen solutions for public infrastructures and energy storage, suitable for cold climates and dispersed settlements.

The HUGE project will achieve this through:

- Providing the necessary tools to assess the hydrogen renewable energy chain opportunities in the NPA area and beyond.
- Increasing readiness to invest in integrated hydrogen solutions suitable for constructing, maintaining and running housing and public infrastructures.
- Facilitating decision making by building capacity in infrastructure providers to exploit the abundance of natural resources to their full potential through raising awareness about the benefits that can be delivered by employing a hydrogen Economy.

The Hydrogen Utilization & Green Energy (HUGE) project is a €1.4 million 3 year project. The project is funded by the Northern Periphery and Arctic (NPA) Programme and is lead by the Environmental Research Institute, North Highland College UHI. The project runs from mid 2019 to mid 2022.

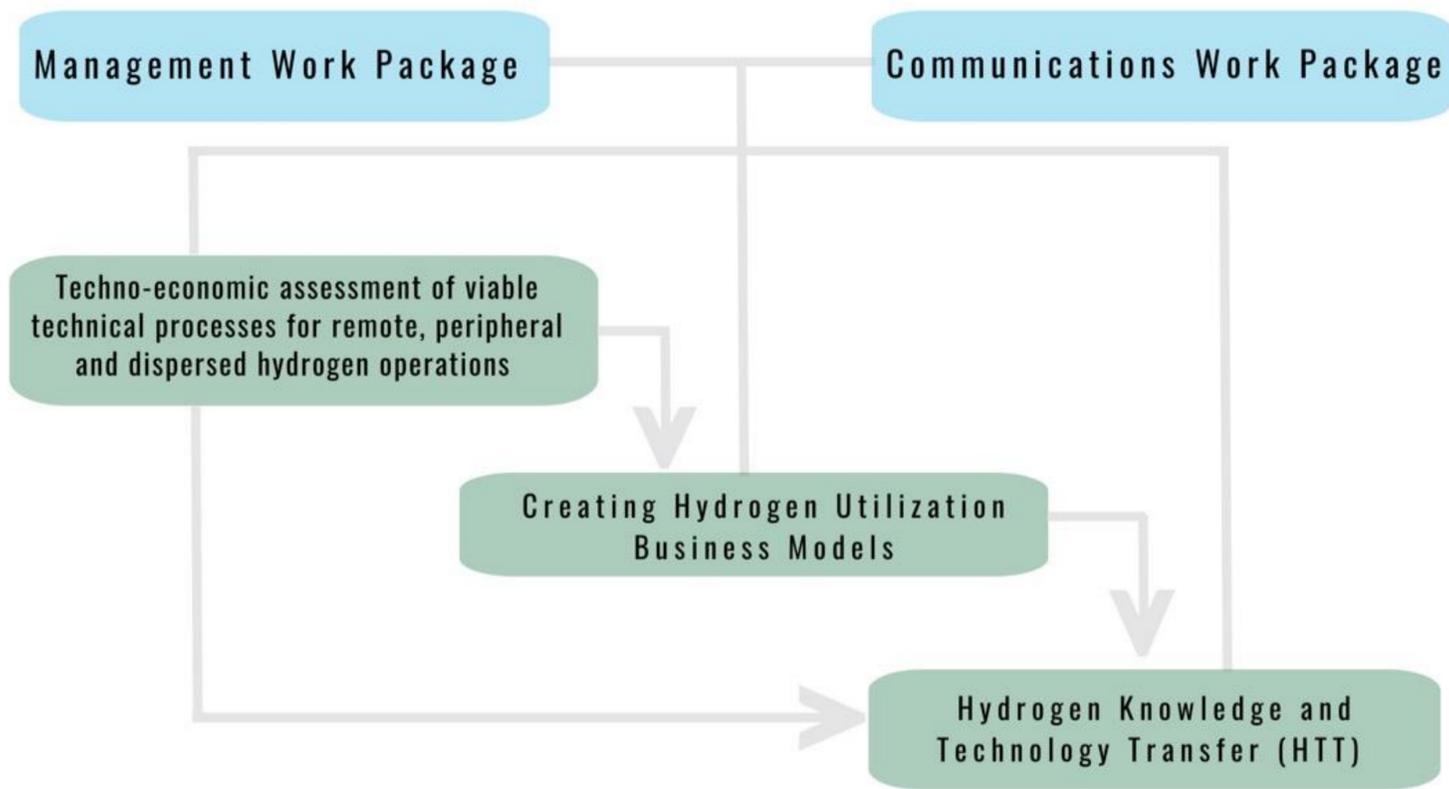
For more info on the project and to sign up to our mailing list please email [info@huge-project.eu](mailto:info@huge-project.eu)



[www.huge-project.eu](http://www.huge-project.eu) | [info@huge-project.eu](mailto:info@huge-project.eu) |    



 **The HUGE Project Structure**



**TEA Tool**

The TEA tool will combine process modelling and engineering design with economic evaluation. The TEA tool, will increase readiness to invest in hydrogen utilization solutions suitable for constructing, maintaining and running housing and public infrastructures in cold climates and dispersed settlements.

Lead Partner: Action Renewables

**HUB Model**

The HUB model will contain generic scenarios, implications and guidance for creating business models for hydrogen product and service development. It will also outline relevant management tools and knowledge required to orchestrate the ecosystem.

Lead Partner: LUT University

**HTT Platform**

The hydrogen knowledge transfer platform will promote knowledge sharing and information exchange between actors in the hydrogen energy in conjunction with small scale renewable energy production, supply and demand, and transport to end user.

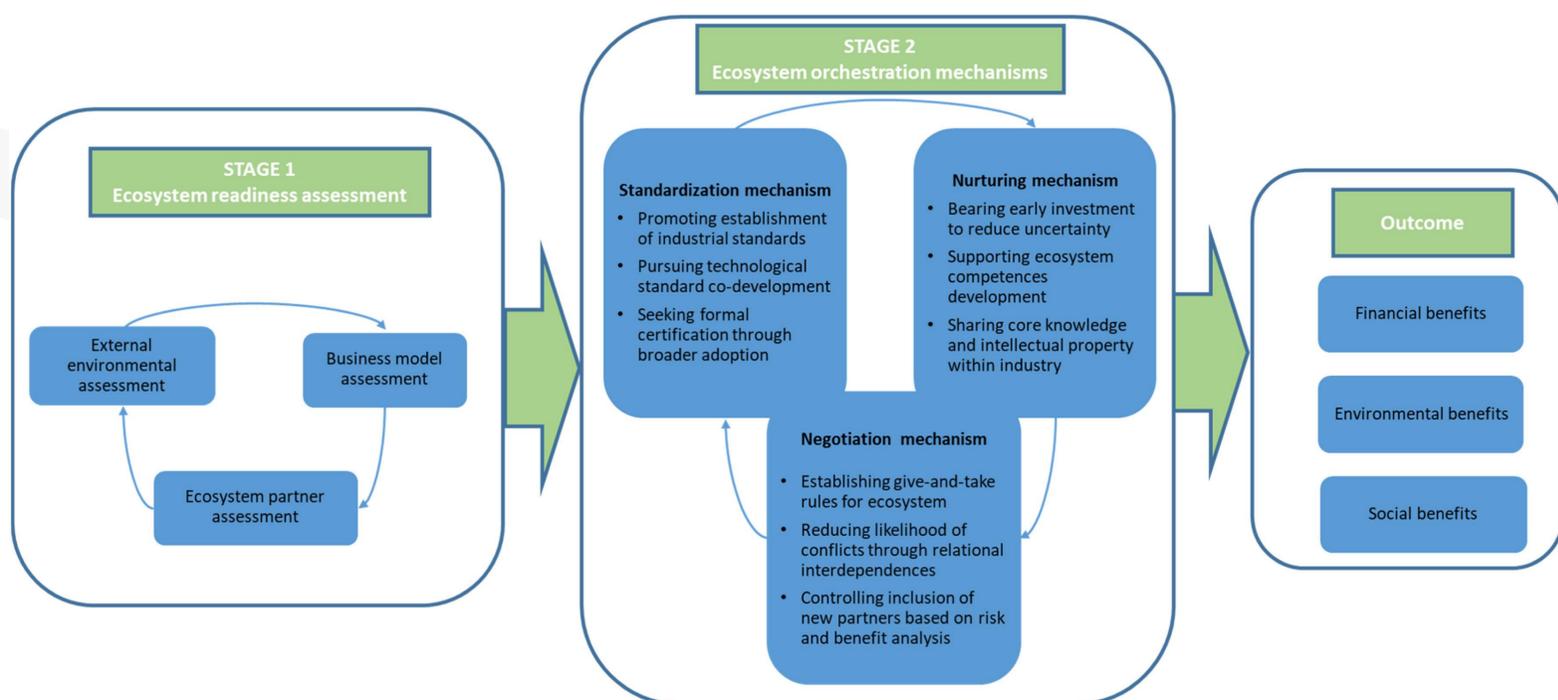
Lead Partner: National University Ireland Galway

## HUB Model

The HUB model contains generic scenarios, implications and guidance for creating business models for hydrogen product and service development. It will also outline relevant management tools and knowledge required for ecosystem orchestration.

The activities start with stakeholder analysis for which the objective is to identify and analyse customer and business value factors for technology adaptation in different stakeholder groups. The results are incorporated in the following ecosystem analysis, aiming at building a value map. The map for each case region is built based on the collected data. The objective is to develop understanding of existing (or projected) business ecosystem and to create a map depicting business actors and value streams between them, after which the case partners and relevant companies that eventually serves as an input for creating business model for a focal company are verified..

After creating the individual HUB models for specific case region they will be analysed in order to develop the generalized model suitable for multiple applications. To support the analysis of business ecosystems and better understanding of the background (i.e. public opinion in the region) the data collection was conducted during summer 2020. The objective was to capture the attitude of general public towards renewable energy solutions. The specific focus in the survey was placed on residential solutions. The key themes in the survey were environmental attitudes, economical factors affecting the individual's choice, green intentions and social influence. The respondents evaluated several purchase scenarios selecting the most appropriate choice. The survey was conducted in the regions covered by the programme including Finland, Ireland, Northern Ireland, Scotland, Iceland, Norway and Faroe Islands. At the moment, the results are in analysis process and once finished will complement the HUB model development.

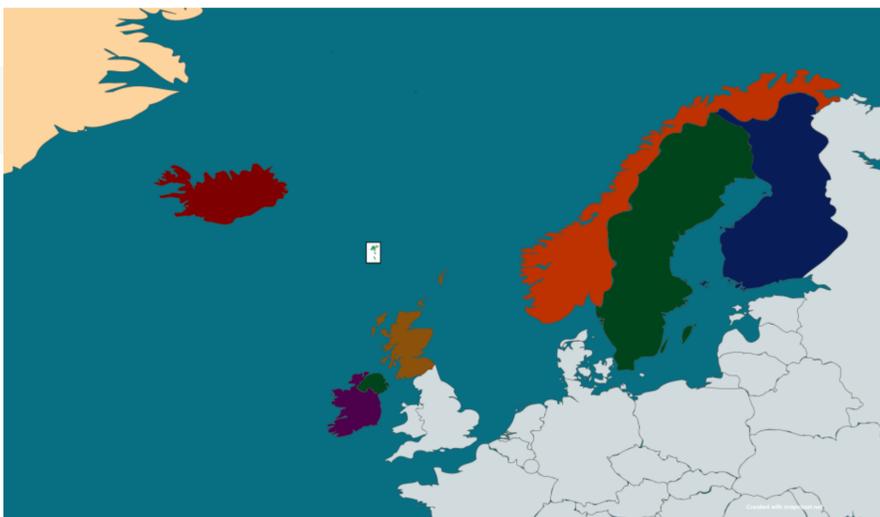




## TEA Tool

Action Renewables is leading the development of the Techno-Economic Assessment tool for the HUGE Project. The TEA tool is made up of several parts that all aim to come together to help to carry out an analysis of a potential hydrogen project and inform whether it is likely to be viable. Some of the key aspects of the tool include:

A technology scale evaluation. This tool aims to classify the scale of a hydrogen project supply chain by investigating whether it is of macro (a supply chain spread across a wide geographical area, likely of multiple countries), meso (a supply chain likely located within one country but over multiple regions or towns) or micro (likely to be located within on defined site) scale. This evaluation also investigates the various renewable technologies that exist and makes a judgment on their suitability for each region. Any future projects can use these scales and examples to help inform potential success of their own project.



A Hydrogen Hotspot map has also been developed to show the spread of hydrogen supply chain infrastructure across the region. A range of supply chain areas were identified, and a sweep of regions carried out to identify organisations that fitted these. Once identified these have been plotted on an interactive map to show where the hydrogen supply chains are located across the project region. Further investigations will continue to add more organisations within and out with the project region. The map is interactive, and the user can zoom in and click on an organisation for more information on each individual spot.

A cashflow analytics tool has also been developed which allows a user to identify the costs of a range of inputs required to develop a project – the purchase cost of land, equipment, staff costs etc – and input these into a piece of modelling software. Once input this tool will assess the level of potential financial return on a year-by-year basis (for up to 20 years) and identify at what stage the project will have paid back the initial investment.

Combining these tool will help to give a high level overview of how to build a suitably sized and costed project.





# HTT Platform

Designed to improve the learning experience and future development of hydrogen technologies in the NPA area, the HTT platform has become a valuable communication tool to reach a wider audience by combining knowledge transfer, stakeholder engagement and e-learning into a single virtual platform.

## HUGE website

Planned and created as a friendly communication tool, the website presents videos, statements, files, databases, etc., to act as an interface between stakeholders and hydrogen experts.

[www.huge-project.eu](http://www.huge-project.eu)



## Knowledge transfer

Promoted with online seminars directed to the NPA communities with the participation of hydrogen experts on road, maritime, and aviation transport technologies. Recordings and presentations are available to download.



## Stakeholders engagement

A hydrogen forum has been developed in collaboration with three Interreg projects (GenComm, SEAFUEL, and HUGE). The so-called Hydrogen Triple Alliance organised the first interregional virtual forum where people concerned on hydrogen technologies can interact.



[www.communityh2.eu](http://www.communityh2.eu)

## E-learning hub

Updated searchable databases are available containing hydrogen training courses per region and language, hydrogen academic courses per country, and general hydrogen knowledge.





## HOT Service

The TEA Tool, the HUB Model, and the HTT Platform will combine to provide the Hydrogen Operational Technical (HOT) Service.

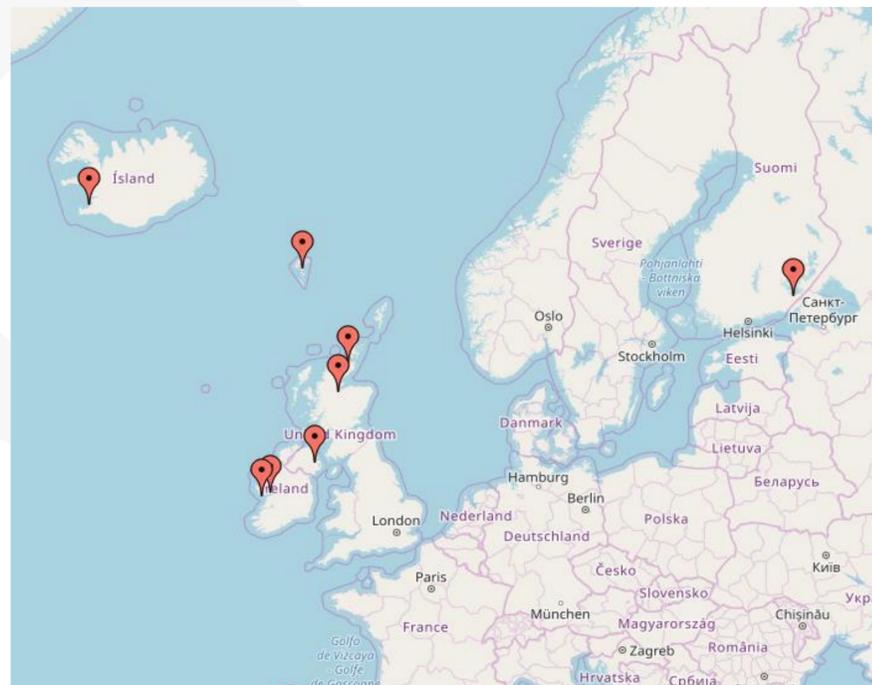
The HOT service, will foster more robust and dynamic communities by allowing them to exploit the abundance of natural resources to create a versatile business sector & energy resilience through storage.

This will positively affect the economic, social and demographic development in the partner areas.

The HOT service will be transboundary and will allow a variety of stakeholders and end users in in the public infrastructure domain and beyond a full economic utilisation of the plentiful renewable resources that surround them by catalysing a hydrogen economy.

Available to all stakeholders and end Users throughout the NPA region, the HOT Service will also link with regions outside of the partnership and with other European initiatives.

## HUGE Partners



The HUGE Project is led by the Environmental Research Institute, North Highland College, University of the Highlands and Islands, Scotland. Project partners can be found from across the Northern Periphery and Arctic Programme Region.

Project partners include:

- The Highland Council (Scotland)
- Action Renewables (Northern Ireland)
- University of the Faroe Islands
- Lappeenranta University of Technology
- National University of Ireland Galway
- Icelandic New Energy
- Aran Islands Energy Coop

