

JustH₂Transit

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Strategic research to support a just and sustainable hydrogen transition

Researchers

In the JustH2Transit project, a total of around 50 energy technology experts, materials engineers, chemists, physicists, social scientists, economists, human geographers, management and bio- and circular economy professionals will create an overview of the hydrogen transition.



Consortium parties

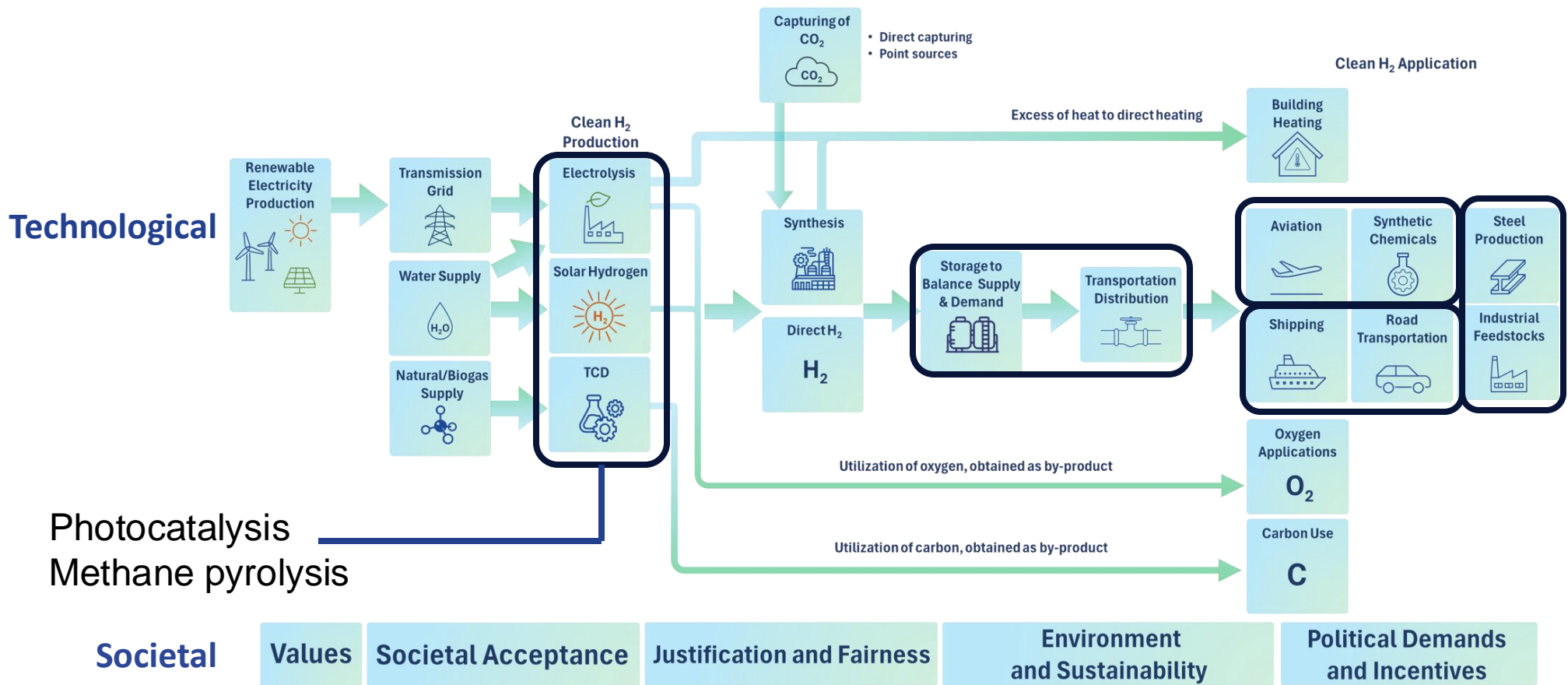


Financers



Just H₂ Transit

Strategic Research on H₂ Value Chain



JustH2Transit aims

Conditions and impacts of the transition to hydrogen

- The project will map the current state of the hydrogen transition in Finland and the related system-level bottlenecks.
- The environmental, techno-economic and social impacts of the hydrogen transition will be examined.

Sustainable use of resources in transition

- The linkages of the hydrogen transition with the bio- and circular economy will be assessed from the perspectives of resource use and sufficiency.
- Answers and alternatives on thematics will be sought to strengthen the resilience, sustainability and equity of our societal solutions.

Societal impact objectives

Objectives of the project

- Sustainable and justified development of the hydrogen transition from an environmental, economic and social justice perspective

Impact objectives at programme level

- **JustH2Transit** supports the development of the hydrogen economy as a key part of responding to the changing global and European environment, while promoting energy security and resilience.

This is what we are doing right now

- Research on the future volumes of electricity and hydrogen, and infra-related challenges that relate to the energy transition
- Literature review of LCA emissions of different hydrogen production methods
- LCA study on hydrogen production from different resources and techniques in different end-uses in Finland
- Data collection on biomass potential as well as hydrogen potential of different biomasses
- Data collection and literature review on hydrogen utilization in transport and industry
- Development of catalyst materials, role of hydrogen in fatigue and fracture behaviour of materials (focus on pipeline steels), lifetime & performance of materials, replacing fossil fuels with hydrogen in steelmaking
- Scenarios for a just hydrogen transition
- Corporate interviews on Finland's hydrogen economy, bottlenecks and systemic enablers
- What is justice in hydrogen economy and transition? Framework: hydrogen transition scenarios and elements of justice
- Defining of case study regions
- Discourse analysis on hydrogen in local and national media
- The opportunities and obstacles of hydrogen transition from stakeholder and regional point of view. Method: Delphi expert panels
- Empirical study to understand local perspectives to hydrogen transition and related land use changes. Methods: interviews, workshops and an online survey

Work packages

Bottlenecks in the transition

Work package 1

- Successful development of the hydrogen economy requires effective management of **energy infrastructure and markets**.
- JustH2Transit aims to provide a **holistic view of the bottlenecks** that slow down the construction of existing and planned energy infrastructure within the target timeframe. The project will assess the ability of different technologies, infrastructure and storage solutions to deliver the efficiency and flexibility needed in the system.
- JustH2Transit will also investigate **temporal energy management** using both fixed and mobile storage solutions. The assessment will take into account the requirements arising from **sector integration** for the production of electricity, hydrogen, heat and valuable chemicals (HVCP).



Leader: Jukka Lassila LUT

Partners: Luke, UO, VTT

Impact analysis

Work package 2

- The different **scenarios** assess the environmental impact of building the necessary hydrogen production capacity, using different technologies.
- The techno-economic assessment of the production routes is based on various cost-related input values.
- The project will provide a framework for assessing the social and cultural impacts of the hydrogen transition.
- A multi-criteria analysis method will be used to combine the results of the techno-economic and socio-cultural assessments with the results of the environmental impact assessment. Guidelines will be developed to integrate these three aspects of sustainability.



Leader: Mika Horttanainen, LUT
Partners: UO, VTT, Luke

Enabling technologies

Work package 3

- A successful system-level hydrogen transition requires unblocking bottlenecks in the production, transport, storage and utilisation of hydrogen.
- Material technologies are crucial enabling technologies. Work package 3 will focus on basic materials research to address these bottlenecks.
- Alternative energy-efficient hydrogen production methods such as direct solar hydrogen (DSHP) and thermocatalytic degradation of biogas (TCD) require new breakthroughs in materials and processes. In particular, photocatalysts based on abundant secondary materials are needed.



Leader: Elina Huttunen-Saarivirta, VTT
Partners: UO, LUT

Preparation and benefits

Work package 4

- Provides background information on the **interdependencies between the hydrogen, bio- and circular economies.**
- Facilitates social acceptance of the hydrogen transition by helping stakeholders to identify their role and contribution to it.
- Identifies system and technology enablers and barriers to the hydrogen transition.
- Explores the interdependencies within our society's resilience in the complex socio-technical hydrogen transition process and ensures that it is prioritised as the transition progresses.



Leader: Saija Rasi, LUKE
Partners: LUT, VTT, UO

Interaction and project coordination

Work package 5

- Interaction activities will aim to connect with relevant stakeholders, including industry, the public sector, policy makers, academia and the general public.
- The aim is to bring stakeholders' perspectives into the research process, to ensure the societal acceptance of the hydrogen transition and to maximise the use of research results in decision making.
- The interaction will be designed as a two-way process.

Leader: Minna Näsman, Akordi
Partners: All

Work package 6

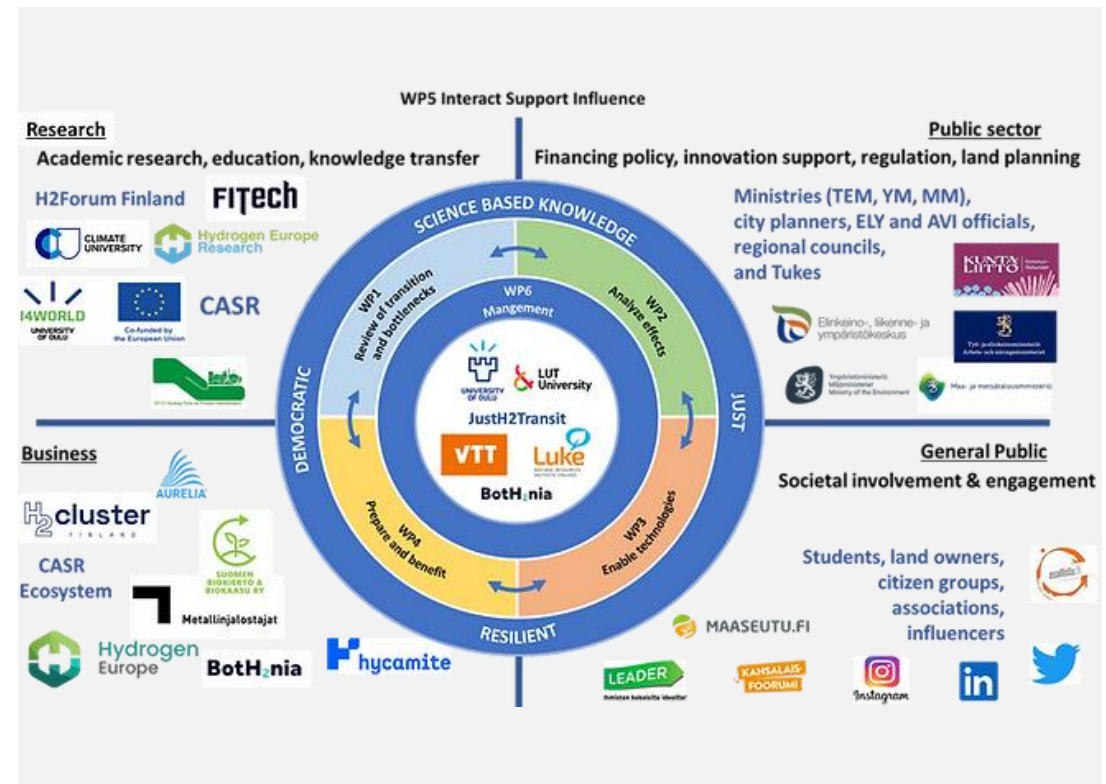
- The project will build on the best practices of projects previously funded through the STN programmes.
- Work package 6 aims to ensure a smooth workflow between the different work packages to ensure high scientific quality and societal impact.
- The project agreement will establish rules and practices for data management and partnership.
- An external advisory board will be established to ensure that project activities are relevant to society. Regular risk analyses will be carried out to identify and address potential problems.

Leader: Marko Huttula, UO

Welcome to join us!

Follow the progress of the project and contribute to the debate on hydrogen transition

- Webpages www.justh2transit.fi and www.both2nia.com
- [LinkedIn BotH2nia](#)
- X @both2nia



Thank you and keep in touch!

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