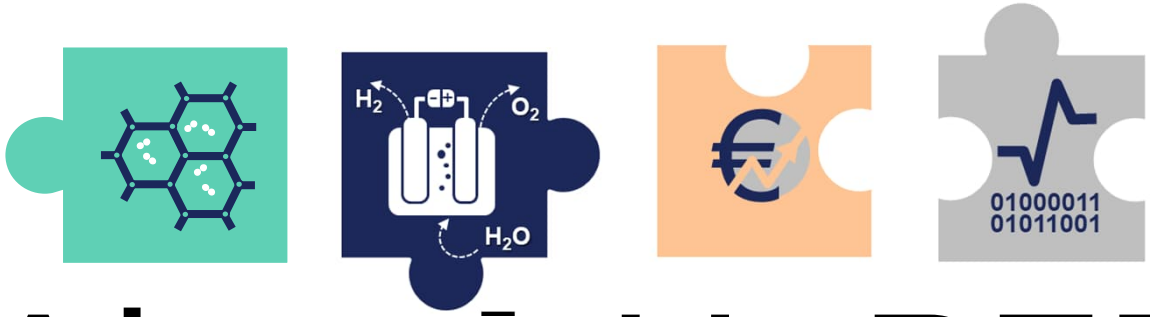

About HyPER

Hydrogen Production and Storage as an Enabler of Industrial Renewal in Central Finland (HyPER)

Bajamundi Cyril, Kärki Janne, Lappalainen Mikko (VTT)
Haukka Matti, Honkala Karoliina, Lahtinen Manu (JyU)

24.01.2024

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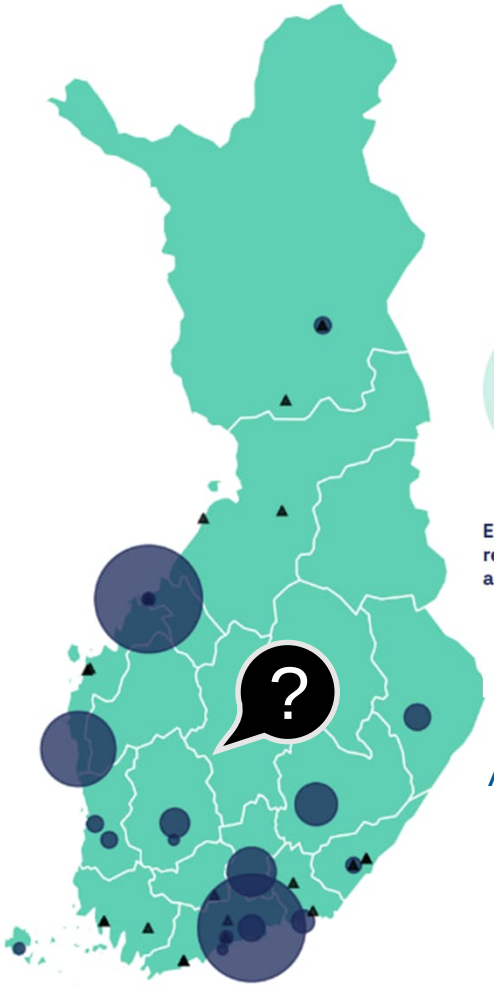
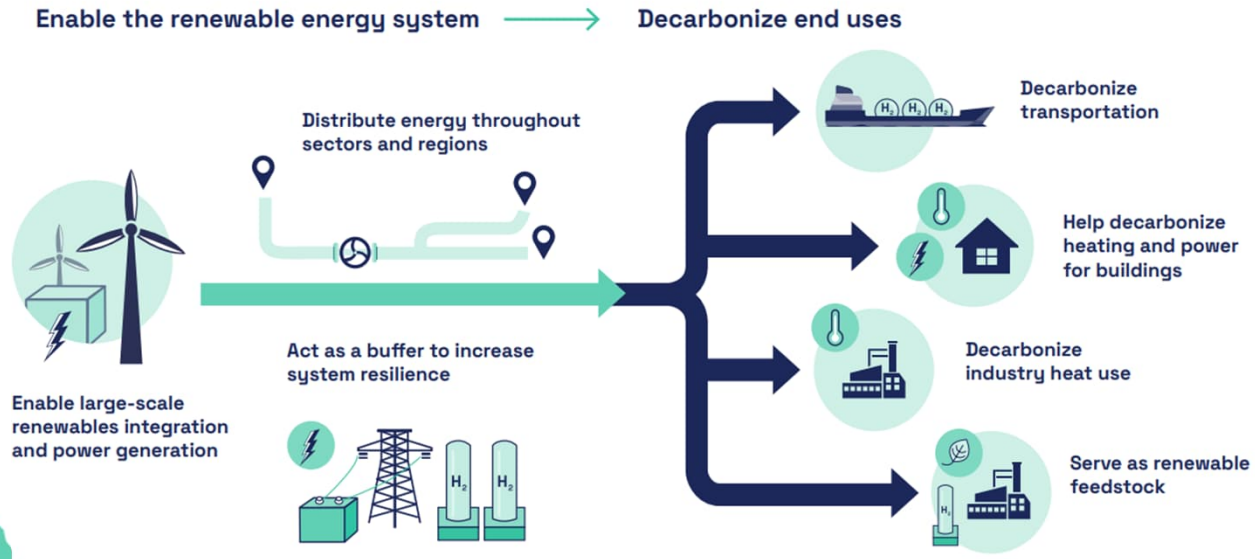
Background

Finland's Hydrogen Economy is accelerating

10%

The Finnish Government has adopted a resolution on hydrogen with the target to produce 10% of the EU's green hydrogen in 2030





Any region with serious decarbonization ambition would need a robust hydrogen strategy because H_2 has the potential to decarbonize many aspects of human activities

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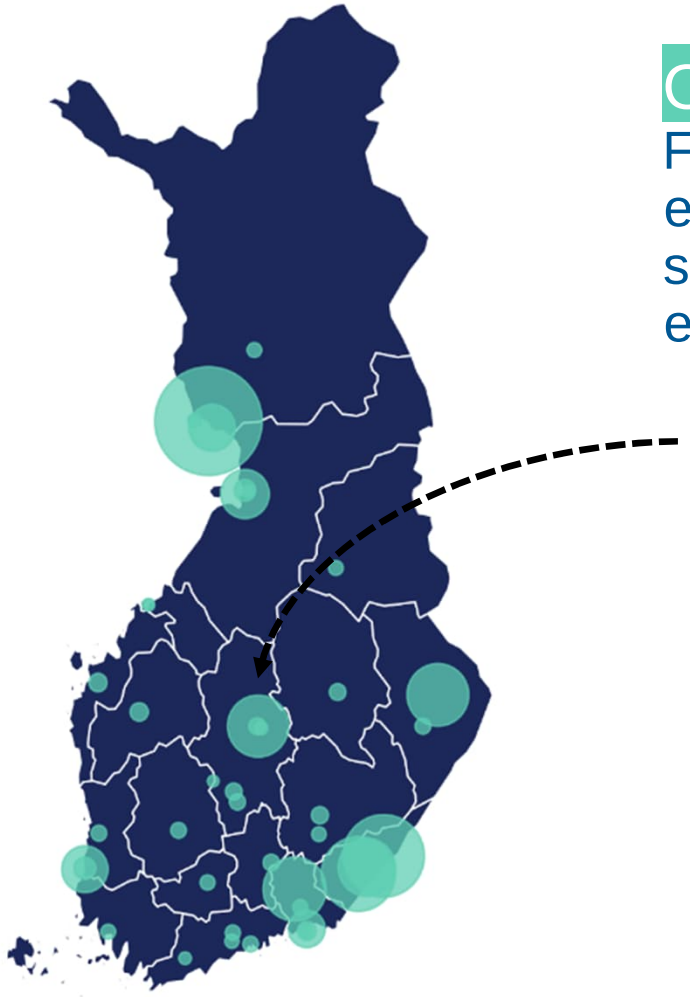

Opportunity Central Finland possesses the key enabling factors for a successful hydrogen economy

- **Access to biogenic CO_2?**
  Äänekoski bioproduct mill is a large source of biogenic CO_2
- **Access to low carbon footprint electricity?**
  Current and planned high kV grid runs through Central Finland, new investments in wind/solar power are also being planned
- **Access to fresh water?**
  Lake Päijänne could provide the water requirement for electrolysis
- **Access to a digitally literate workforce?**
  The region has a university and applied university populated by a young and vibrant student body
- **Has a strong ICT sector?**
  JyU and JAMK have strong programs on cybersecurity, artificial intelligence, and data analytics

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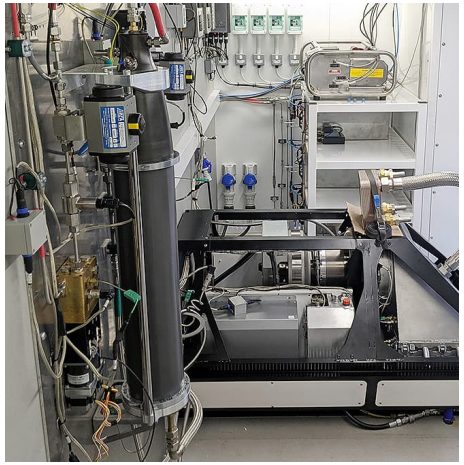
Cutting across a large value chain





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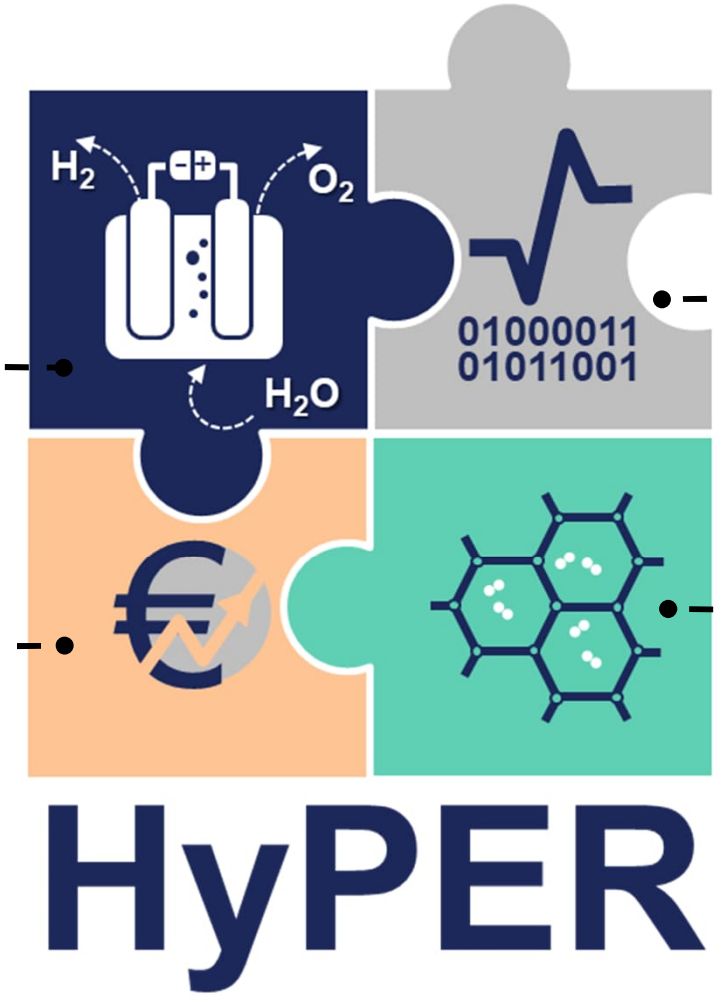
Hydrogen Production and Storage as an Enabler of Industrial Renewal in Central Finland

Anion Exchange Membrane Electrolysis

Digitalization



Business

Hydrogen Storage

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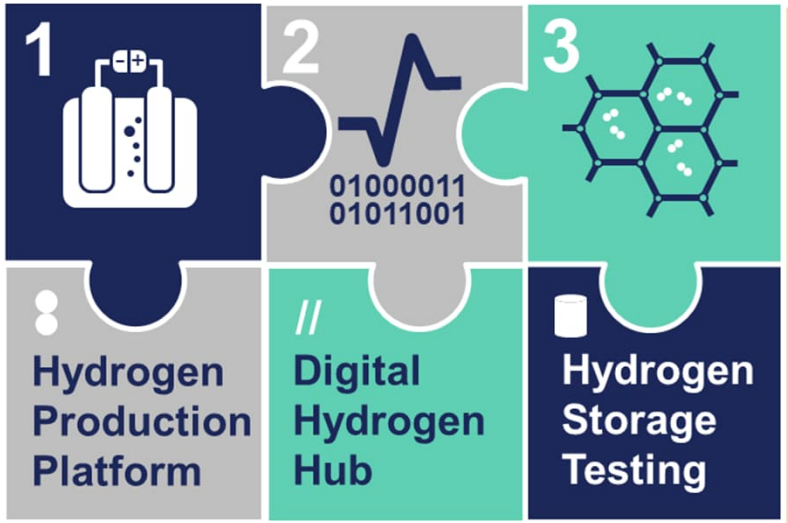
HyPER Investment



HyPER project and investment focus on establishing a hydrogen production and storage testing platform in Central Finland

Safe and viable hydrogen production with Anion Exchange Membrane Electrolyser (AEMEL) optimized for solar & wind production and spot electricity prices.

Development of digital infra and control-oriented models for AEMEL and electrolyser hydrogen production and business landscaping.

Hydrogen storage with metal organic framework, zeolite and bio-based carbon adsorbent storage media.

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Work packages and tasks

Work Package	WP 1 [VTT] Coordination	WP 2 [VTT] Hydrogen Production Platform	WP 3 [VTT] Digital Hydrogen and Business Landscaping	WP 4 [JyU] Hydrogen Storage with biomaterials	WP 5 [VTT, JyU] Communication and Dissemination
Objectives	• Coordinate the implementation of key activities in the project. • Ensure communication among stakeholders is efficient. • Lead in project financial management and reporting.	• Design the H_2 production Platform and procure the AEMEL • Install and commission the platform • Plan and conduct experiments on the platform	• Procure a supervisory control and data acquisition system for the platform • Install and commission the digital infra • Develop a dynamic system modelling for the platform components • Analyse business case concepts related to H_2 Economy in Central Finland	• Search for the most cost-effective hydrogen storage materials. • Develop carbon, MOF and zeolite-based materials for hydrogen storage. • Investigate whether activated carbon produced in the Central Finland region is suitable for hydrogen storage. • Search for available biomaterials and side stream materials in the Central Finland region that are suitable as raw materials for hydrogen storage materials.	• Effectively communicate to stakeholders the key results of the project • Share out information about the results of the project • Explore other relevant parties with interest in the hydrogen economy in Finland
Output	• [M] Excellence in project management and execution	• [M] Hydrogen production platform in operation • [R] Demonstrated the dynamic operation of the platform with a focus on solar, wind production pattern matching and spot electricity price matching operation	• [M] SCADA system is set up and in operation • [R] System dynamic model is developed, and system stability is analyzed. • [R] Business case for H_2 integration in industries in Central Finland identified.	• Added value for locally produced activated carbon • New applications for biomass and side streams.	• [M] Results of the project will be via a project website, articles, active social media and networking groups • [M] Key stakeholders participated in a live demo workshop VTT Jyväskylä.

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[M] Milestone [R] Report/Document

HyPER consortium

Funded by:

KESKI-SUOMEN LIITTO
REGIONAL COUNCIL OF CENTRAL FINLAND

Partner Companies:

VIREON
A Norwegian Hydrogen Company

HITACHI
Inspire the Next
Hitachi Energy

ANDRITZ

Fimpec

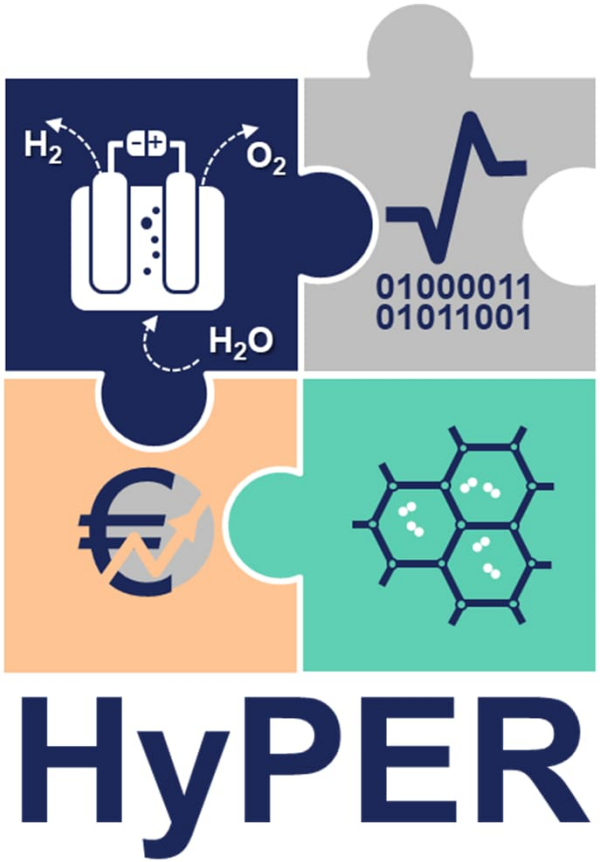
MYRSKY

Kytola INSTRUMENTS

schwer fittings

BUSINESS JYVÄSKYLÄ

The outcome for Central Finland



HyPER project identifies and demonstrates how the H_2 economy enables *justly* transition towards Central Finland's 2030 Carbon Neutrality Target

- H_2 economy
- Industrial Renewal
- New business opportunities

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Thank you!

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