



Hydrogen Transition and Knowledge Initiatives: Hydrogen Futures Lab at TU Munich, Hydrogen Valley Campus The Netherlands, and examples of Large scale Training

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Presentation- Confidential



Hydrogen Future Lab- Munich

- › International Future Lab with researchers from 13 countries
- › The German Federal Ministry of Education and Research
- › The experts are from Australia, Brazil, Germany, Italy, Canada, Lithuania, The Netherlands, Poland, Portugal, Sweden, Switzerland, the USA and the United Kingdom



Hydrogen Future Lab- REDEFINE H2E project

- › Several visiting professors and academics coming to TU Munich
- › Research facilities and test stations
- › PhD candidates under joint supervision etc

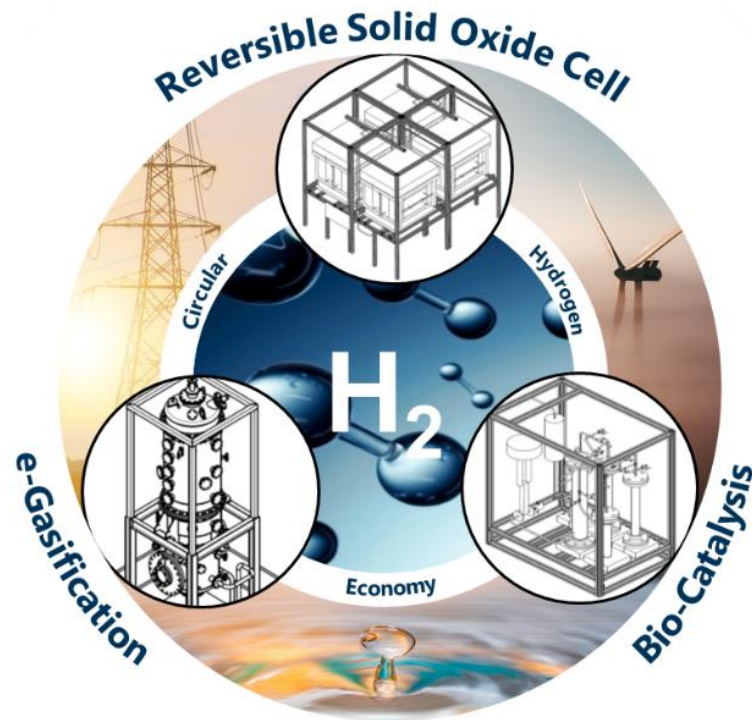
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<https://www.tum.de/en/news-and-events/all-news/press-releases/details/tum-koordiniert-zukunftslabor-fuer-gruenen-wasserstoff>



Hydrogen Future Lab: Core Technologies



<https://www.epe.ed.tum.de/en/es/research/projects/redefineh2e/>



Groningen and The North Netherlands

As of now

- Groningen- The largest gas field in Europe
- Extensive (international) natural gas supply network
- Natural gas production to end- Earthquakes

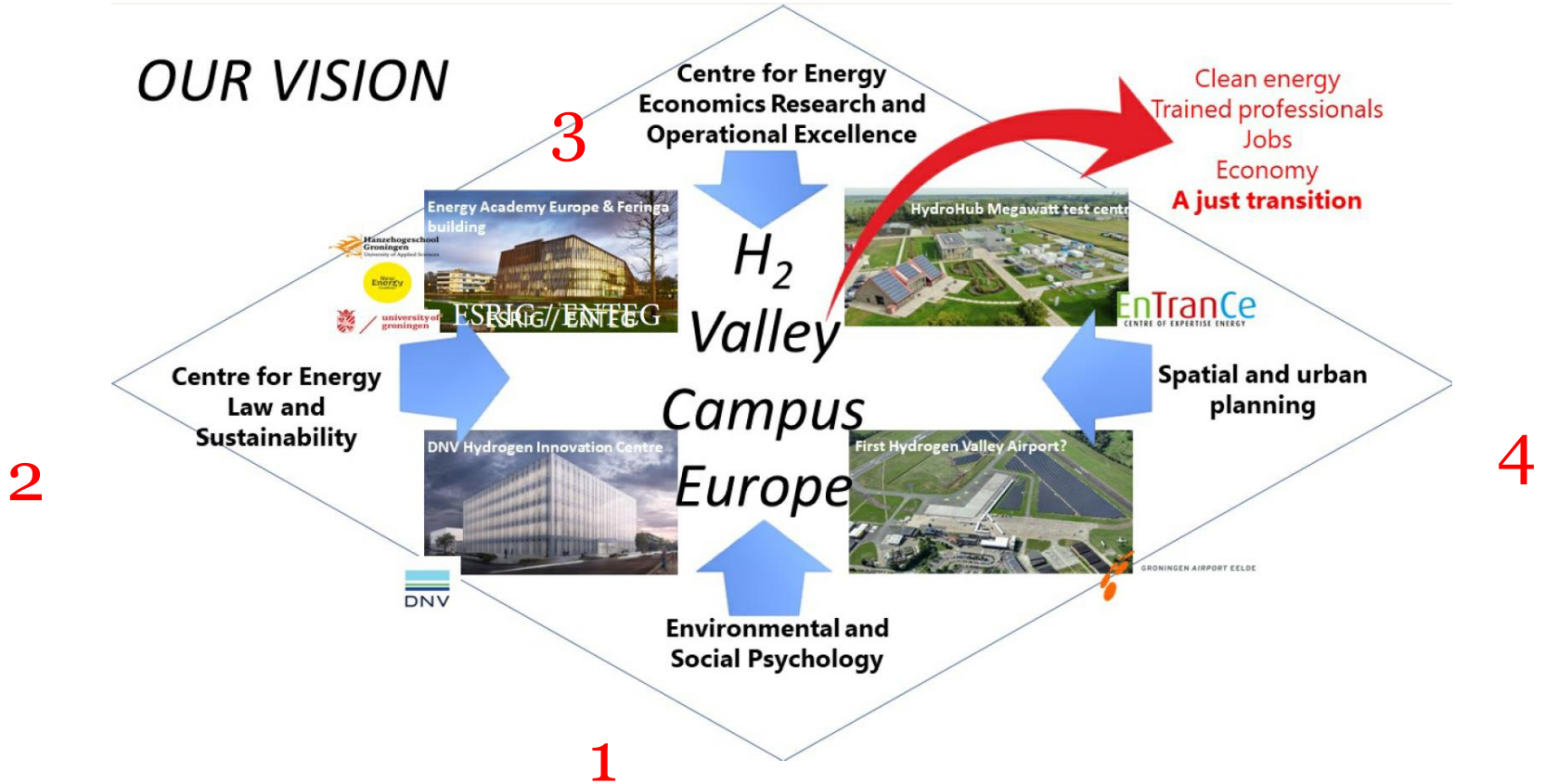
What next?

- Large scale wind power production
- Large scale hydrogen production? **First hydrogen valley of Europe?**
- Several large scale hydrogen projects coming up including
 - **Several large scale electrolyser projects**
 - **Large hydrogen/fuel cell truck building facility etc**
- Underground hydrogen storage- Salt Caverns
- Net Zero initiative with biomass and hydrogen playing important roles



Developments in Groningen – Hydrogen Valley

OUR VISION



Joint Action from RUG, Hanze, NEC, and other key societal partners from Hydrogen Valley to attract a total investment capital of 160M Euro by end 2032.



The Hydrohub/MW Scale Test Center



- **Sub MW scale test stations for electrolyzers**
- **Industry involved**
- **PhD research focused on system studies and integrated system testing**



Hydrogen and Fuel Cell Research at the Chair of Energy Conversion, ESRIG

Our focus

- Hydrogen and fuel cell teaching programs
- Development of high efficiency systems
- Chemistry and Electrochemistry of Fuel Oxidation
- Electrolysis and reversible fuel cell systems
- Stationary and mobile applications
- Aircraft and marine propulsion
- Fuel processing for SOFCs- mainly for
- Biofuels-Early focus on biomass gasifier-SOFC systems
- Waste to energy and resources



Several thousand fuel cell technicians are expected to be required in the coming years. KnowHy is a 3 year European FP7-project that developed an innovative online cum hands-on educational program for technicians working with hydrogen and fuel cell systems.

Features of the program:

- Five courses with one common core module and five specialisation modules
- Specific training, focused on applications which are going to enter market
- Courses in E-learning format available in 7 languages and in multiple countries
- Comfortable format for active technicians
- Practical training, Serious Games and Tutoring to complement the lessons.
- Low cost and easily adaptable training format

The consortium:





TeachHy

Partners



UNIVERSITY OF
BIRMINGHAM



Technical
University of
Denmark



- Full MSc Program on Hydrogen and Fuel Cells
- ~60% online lectures to be taught by experts from various European universities
- Might be offered at Dutch universities
- Innovative teaching methods
- Student exchange

The TeachHy project is part of the project portfolio of the [Fuel Cells and Hydrogen 2 Joint Undertaking](#).

Project reference: 779730





Thank You!