

TeachHy

Teaching Fuel Cell and Hydrogen Science
and Engineering Across Europe within

Horizon 2020



European
Hydrogen
Week



Robert Steinberger-Wilckens

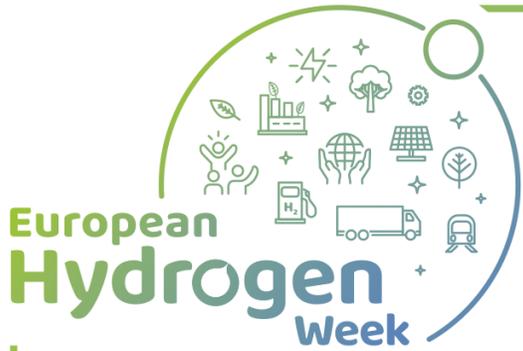
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#PRD2020
#CleanHydrogen





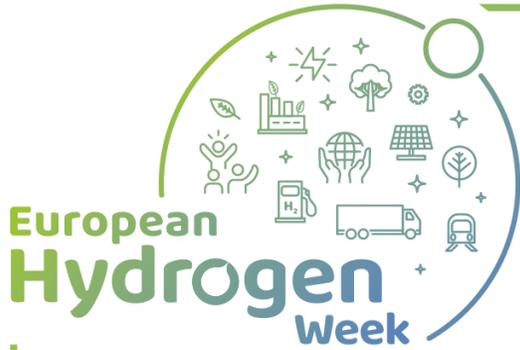
TeachHy Overview



- Call year: 2017
- Call topic: FCH-04-3-2017
- Project dates: 01.11.2017 - 31.10.2022
- % stage of implementation 01/11/2020: 65 %
- Total project budget: 1 248 528 €



- FCH JU max. contribution: 1 289 658 € / Other financial contribution: 1 000 000 €
- Partners: University of Birmingham, Technical University of Delft, Politecnico di Torino, National Technical University of Ukraine 'Kyiv Polytechnic Institute' - KPI, Denmark Technical University - DTU, University of Chemistry and Technology, Prague - UCPT, École Polytechnique Fédérale de Lausanne - EPFL, Université libre de Bruxelles - ULB, University POLITEHNICA of Bucharest, Grenoble institute of technology - INP, Ulster University, Karlsruhe Institute of Technology - KIT



TeachHy - Teaching Fuel Cell and Hydrogen Science and Engineering Across Europe



Objectives

- establishing a blended learning MSc course to be delivered by a network of European universities
- establishing a focal point of advanced education in FCH technologies
- offering CPD and public educational materials and certified professional courses
- developing means of offering virtual and distance access to laboratory facilities
- implement public-facing material on the NET-Tools platform
- offering subscription/licensing of universities to the TeachHy concept

State of the Art

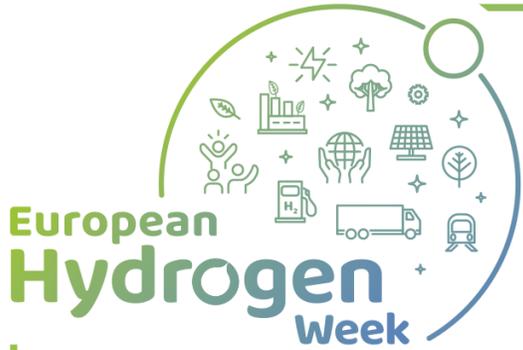
- no comparable online or blended learning offerings

MAWP Reference

- none – education only mentioned in one paragraph, mainly aimed at safety and RCS

TeachHy Motivation

- many universities cover single topics in FCH in courses such as Physics and Chemistry (thermodynamics, electrochemistry), Chemical & Mechanical engineering etc.
 - within the EU only one (!) university offers an FCH MSc degree
 - many universities are willing to contribute to FCH MSc programmes but can only cover about ~30% of the necessary lecturing material and capacity
 - a number of 50 to 200 university MSc courses are needed to cover the HR demands by 2030 (~50,000 trained engineers/scientists)
- how can the missing ~70% of teaching be supplied?
- how can quality of teaching be assured in a high number of newly developed programmes?



TeachHy Actions



Project Deliverables

- implementing prototype full 12-month MSc programme on UoB LMS system
- running full or modified programmes (18 & 24 months) at other consortium partners
- adapting TeachHy content to CPD needs
- running CPD courses at TU Delft and RU Groningen, as well as with partnering organisations
- translating content to make access easier across Europe and build vocabulary

Project Associate Network

- offering modules and whole MSc programme to universities outside the consortium
- offering licensing and distance delivery of modules
- offering support with exams, labs, and research projects

Implementation on LMS



Achievement to-date

0%



90%

100%

25%

50%

75%

Accomplished

- modules recorded and implemented on CANVAS
- complete set of modules documented, programme prepared for accreditation
- accreditation of all modules at UoB
- hybrid course delivery at TU Delft, Grenoble INP, EPFL

Ongoing

- testing on different LMS platforms (CANVAS, Blackboard, etc.)
- translation of material (Romanian, German)

Outstanding

- accreditation at multiple universities



Fuel Cell and Hydrogen Techno X +
 https://canvas.bham.ac.uk/courses/32407

- Home
- Announcements
- Assignments
- Discussions
- People
- Pages
- Files
- Syllabus
- Outcomes
- Quizzes
- Modules
- Conferences
- Collaborations
- Attendance
- Chat
- SCORM
- Panopto
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C2 - 2 Basic Introduction to Ele X +
 https://canvas.bham.ac.uk/courses/32407/pages/c2-2-basic-introdu... 80%

Learning outcomes

- A recap of the previous module on Electrochem
- Applied to fuel cells and electrolysis

Lecture 2: A Basic Introduct

Please make sure you use the full screen feature t

Begin by watching the video lesson for this unit.

The lecture slides can be downloaded below.

A basic introduction to Electrochem

UNIVERSITY OF BIRMINGHAM

Introduction to Thermodynamics and Electrochemistry

Dr. Shangfeng Du

Centre for Fuel Cell and Hydrogen Research
 School of Chemical Engineering

Courtesy to Jens Oluf Jensen

C2 - 2 Basic Introduction to Ele X +
 https://canvas.bham.ac.uk/courses/32407/pages/c2-2-basic-introdu... 80%

Max. Efficiency

FC (LHV)

FC (HHV)

Carnot efficiency

$T_{low} = 0, 20, 50, 100$

Summary

Expand all

Resources

Presentation: A Basic Introduction to Electrochemistry and Thermodynamics

References

Windows taskbar with Start button, application icons (Word, Firefox, etc.), and system tray showing date 06/11/2019 and time 08:02.

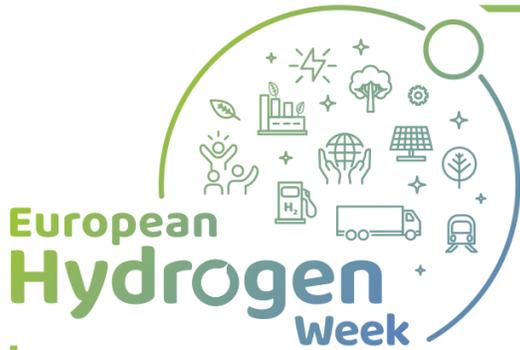
Risks, Challenges and Lessons Learned

Accreditation procedures

- diversity of accreditation models at universities
- reluctance of university administrations to accept external contributions
- 'ownership' of modules

Financial issues

- divergence of university financing models and tuition charges
- reluctance of funding of educational activities - resulting in underfunding, considerable unpaid and unrecognised university input



Exploitation Plan/ Expected Impact

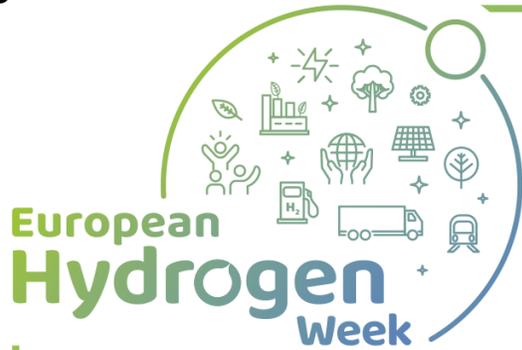


Exploitation

- roll-out of the MSc course implementation across the partner network
- establishment of a post-project business entity to maintain and update educational material database
- implementation of CPD schemes
- cooperation with various educational initiatives:
CPD in Saarland for automotive networks, Austria for automotive company, and Germany for group of logistics companies

Impact

- access to MSc- and professional level FCH educational material across EU
- option for a multitude of universities to offer FCH-related courses and specialisation
- adaptation of university-course material to technician training and CPD
- broader public, stakeholders and politician education



Synergies With Other Projects And Programmes



Interactions with projects funded under EU programmes

- TrainHy – MSc course based on syllabus developed by TrainHy
- HySafe – Hw safety module from HySafe
- KnowHy – blended learning and CPD approach



Interactions with national and international-level projects and initiatives

- IPHE – Educational Activities – represented by Jürgen Garcke on Advisory Board
- EPSRC Supergen H2FC Hub – use of Educational Portal
- T.I.M.E. network – network partners



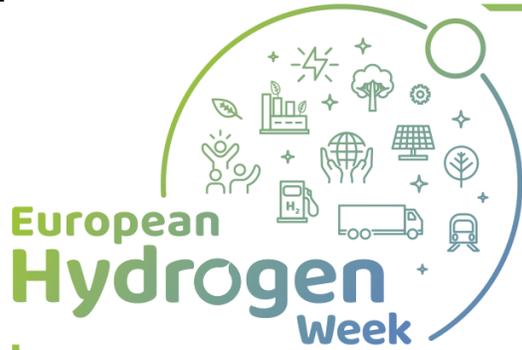
International Partnership
for Hydrogen and Fuel Cells
in the Economy



Interactions with private projects and initiatives

- JESS – Joint European Summer School – cooperation on module development and delivery





Communications Activities



Facebook group



Linkedin entry



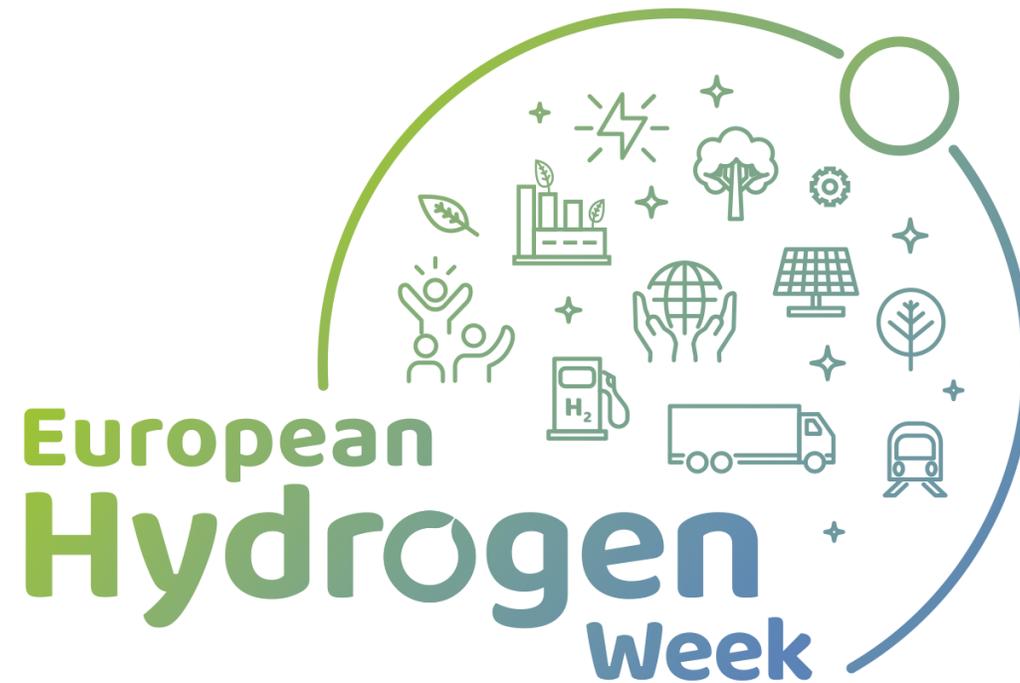
Twitter feed



dedicated web site

www.TeachHy.eu

with blog and regular newsletter



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