

H2Excellence – Fuel Cells and Green Hydrogen Centers of Vocational Excellence Towards Affordable, Secure, and Sustainable Energy for Europe

Newsletter 1-2024

Introduction

At the moment, the boom of green hydrogen production and development and deployment of related technologies such as fuel cells are skyrocketing in European countries and globally. This will bring about large-scale adoption of hydrogen production and utilization in various sectors in the near future. This move will simultaneously create the need for a skilled workforce in the job market, the development of more and more educational and training programmes for students and engineers, and the re-skilling of existing energy sector employees. At present, there is a limited specialized in the sector.

This project stands at the forefront of Europe's journey towards accessible, reliable, and environmentally sustainable energy solutions. By concentrating efforts on nurturing specialised hubs for fuel cells and green hydrogen technology, H2Excellence contributes significantly to the accomplishment of the European Union's ambitious energy and climate objectives. The project will create and implement lifelong learning opportunities including an online learning platform and develop national and international curricula and training programmes. The established COVEs in different EU regions will be fully integrated into the innovation, skills, and job ecosystem in green hydrogen and fuel cell technologies. The vocational education training (VET) clusters will undertake activities such as developing transnational, joint curricula, and lifelong trainings; interaction with universities to understand the current state-of-the-art technologies; exchange of VET teachers, students, and staff; partnerships between companies and professionals; regional ecosystems mapping and integration within the national/regional economic and innovation ecosystems. The H2Excellence aims at establishing world-class reference points for green hydrogen technology training for both initial training of young people and engineers, as well as up-skilling and reskilling of adults, by providing flexible and timely training for the skills needs of green hydrogen companies.

The project will also be internationalized in North America via cooperation and partnership for VET opportunities and exchange programmes between the EU and Canada. Fully in line with the EU Green Deal goals and energy transition targets, the project intends to create the infrastructure necessary to embed vocational excellence in the European hydrogen sector, as well as to contribute



to transforming the sector towards quality employment and careerlong opportunities.

The project is co-funded by [Erasmus+ programme](#) of EU for four years between 15 June 2023 to 14 June 2027. It is coordinated by Vaasa University of Applied Sciences (VAMK), Finland.

Objectives

The overall objective of the H2Excellence project is to establish **Centres of Vocational Excellence (COVEs)** with a focus on fuel cells and green hydrogen that are fully integrated into the innovation, skills, and job ecosystem of the respective EU regions.

The main objectives are:

1. To establish a collaborative network to bridge industry skill gaps in the fields of fuel cells and green hydrogen technologies
2. To design, pilot, and implement several trainings for students at different levels at vocational education training (VET) institutes
3. To offer teacher upskilling programmes and training and technical support initiatives for Small and medium-sized enterprises (SMEs) across CoVEs in green hydrogen technologies, addressing technical, training, and reskilling topics
4. To establish world-class reference points for training in green hydrogen technologies for young people, engineers, and adults
5. To establish a solid collaborative education-business-research network
6. To develop an international collaborative online platform/Knowledge hub for knowledge sharing about green hydrogen technologies
7. To promote and raise awareness of the use of hydrogen in different industrial sectors, mobility, and urban environments
8. To internationalization of vocational training and education in the field of hydrogen

Impacts of the Project

The project has anticipated following impacts during and after the completion of the project:

1. Produce a competent workforce for the hydrogen industry, with skills and competence aligned with the market needs
2. Develop and provide training of staff, students, and company staff (up-skilling and reskilling)
3. Spread and replicate project results in other regions in order for other education providers to provide training of staff, students and training of company staff for working life
4. Get the result of VET rolled out on a national level and part of the national/regional curricula
5. Strengthen further international cooperation and mobility of staff, students but also for green hydrogen experts and workers
6. Foster international support to companies (SMEs) operating in green hydrogen through technical support, training, reskilling and upskilling employees
7. Foster common activities and collaboration between different green hydrogen supply chain partners, including research and innovation support hub

H2Excellence Consortium

H2Excellence consortium is specialized within fuel cells and green hydrogen that intends to develop vocational, academic, and lifelong professional training offerings in the field. It brings together different of stakeholders with interdisciplinary backgrounds such as leading vocational education and training (VET) and professional training providers, renowned academic institutions, world-class leading public R &D institutions, business representative organizations, internationally recognized technology and science park, SMEs with expertise in e-learning and training methodologies, VET representative and umbrella organizations, and Leading consultancy with expertise in lifelong learning and labour market issues. The project consortium consists of 24 partners from 9 different Erasmus+ countries (Finland, Italy, Spain, Portugal, France, Germany, Poland, Greece, Romania) and 1 international partner (Canada).

1. Vaasa University of Applied Sciences, **VAMK**, Finland
2. Agency for New Technologies, Energy and Sustainable Economic Development, **ENEA**, Italy
3. National Laboratory for Energy and Geology, **LNEG**, Portugal
4. Centro Superior de Formación Europa Sur, **CESUR**, Spain

5. Oy Merinova Ab, **MERINOVA**, Finland
6. University of Perugia, **UNIPG**, Italy
7. Vamia (City of Vaasa), **VAMIA**, Finland
8. Pôle Véhicule du Future, **PVF**, France
9. Mondragon University, **MGEP**, Spain
10. Polytechnic Institute of Portalegre, **IPP**, Portugal
11. Energy Cluster of Valencia Region, **CECV**, Spain
12. Enti CONfindustriali Lombardi per l'Education, **ECOLE**; Italy
13. Federation of Scientific and Technical Associations, **FAST**, Italy
14. Instituto de Soldadura e Qualidade, **ISQ**, Portugal
15. Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, **CIEMAT**, Spain
16. Atena scarl - Distretto Alta tecnologia Energia Ambiente Italy, **ATENA**, Italy
17. Competitiveness and Technology Cluster for Energy, **EnergyIN**, Portugal
18. University of Malaga, **UMA**, Spain
19. Ascendis, **ASCENDIS**, Romania
20. Malaga Tech Park, PTA, Spain
21. European Association of Institutes for Vocational Training, **EVBB**, Germany
22. Regional Pomeranian Chamber of Commerce (Cluster of Hydrogen Technologies), **RIGP**, Poland
23. EEO Group, **EEO**, Greece
24. Polytechnique Montréal, **EPM**, Canada

Project Development Structure and Workplan

The project is divided into 6 work packages (WP), each WP itself is divided into several Tasks (WP). Altogether, there are 35 Tasks in 6 WPs that are led by different project partners.

- Project management and coordination - **WP1**
- Skills assessment, competencies gap analysis, and preparatory actions – **WP2**
- Teaching, training, and learning activities – **WP3**
- Cooperation, partnership, and networking – **WP4**
- Knowledge hub and international collaborative platform for H2 CoVEs – **WP5**
- Ecosystem development, dissemination, impact and long-term sustainability – **WP6**

The Figure 1 illustrates the workplan structure with all included WPs.

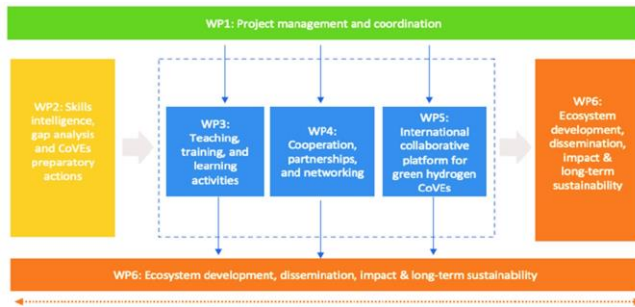


Figure 1: H2Excellence project workplan structure

Progress in 2023

The H2Excellence project accomplished number of activities during 2023. Even though official starting date of the project was June 15, 2023, the actual project started in September, 2023, after the Kick-off meeting was held.

Kick-off meeting

The project's kick-off meeting was held at the Vaasa Innovation Centre and the Scandic Hotel Waksia in Vaasa on September 11–12, 2023. The meeting was also organized online in Teams. A total of 45 participants from 21 partner organizations took part in the meeting. As extra activities, all participants visited 'The Kvarken Archipelago', a World Heritage Site, where dinner and sauna bathing were organized at Kalle's Inn Resort. The participants were welcomed by Niklas Ulfvens and Kaisa Penttilä from the Ostrobothnia Regional Council.



Deliverables and Milestones

In 2023, the project submitted two deliverables: a) Project management and coordination plan and b): Communication, dissemination, and ecosystem integration report in September 2023.

Networking and Promotional Activities

Networking is one of the important activities of the H2Excellence project. H2Excellence took part in the Forum on Vocational Excellence which was held on September 25–26 in Amsterdam, the Netherlands. From the H2Excellence project, Dr. Karna Dahal, Mrs. Marja-Riita Vest, Mrs. Sirpa Loukiainen-Nygård from VAMK (Finland), and Mr. Antonio Gennarelli from EVBB (Germany) joined the event, promoted the project, and networked with various stakeholders and partners.

In another event, Dr. Francesca Santoni from ENEA (Italy) and Prof. Paulo Brito from IIP (Portugal) presented the H2Excellence project and their objectives in the final conference of the Waste to Hydrogen conference held in Portalegre, Portugal, on November 9–10, 2023. .

In addition, H2Excellence also participated at European Hydrogen Week. From the H2Excellence project, Dr. Giovanni Cinti from the UNIGP (Italy) and Magdalena Raczyńska and Marek Kruszewski from RIGP (Poland), Poland participated in the conference and took part in networking. Dr. Cinti also engaged in the discussion on the "Skills and Workforce Development for the Hydrogen Economy" side event by IPHE, shedding light on global perspectives and collaborative efforts.

H2Excellence was also promoted at CIREDU conference at the Ikiam Regional Amazonian University in Ecuador, held on December 4–7, 2023. Prof. Olga Guerrero-Perez from the UMA in Spain gave an invited talk on "Hydrogen as an energy vector within the framework of the European project ERASMUS-EDU-2022-PEX-COVE Partnership for Excellence - Centers of Vocational Excellence" at the 10th international research congress of CIREDU conference.

Project's Website Launched

The website of the H2Excellence project was launched on December 19, 2023. The project website offers information about the activities performed at H2Excellence project. Do not forget to visit the website at <https://h2excellence.eu/> for such activities.

Communication and Dissemination Activities

The project established [LinkedIn](#) page for the future communication and dissemination activities and also created a promotional [Video](#) and [YouTube channel](#). The LinkedIn page is updated continuously and we invite you to follow both the LinkedIn page and YouTube channel.

Progress in 2024

This newsletter covers the project progress information until August 2024 only.

Completed Events

The project also organized a general meeting in January 2024 to discuss the project's progress and challenges with all partners. The project's general meetings are held every six months.

Three events (both online and hybrid workshop and seminar) were organized by the H2Excellence project in 2024. The first event (online seminar) was organized by CIEMAT (Spain) on April 18, 2024 which was about the advanced materials for hydrogen production and uses. The second event (workshop) was also organized on 22-24 May 2024 by CIEMAT as a side event at WhyH2 - Sustainable Industry Congress. Both events disseminated the project. And the third event (online seminar) was organized by MERINOVA (Finland) on August 7, 2024 which was about the Hydrogen Storage and Transmission: Health, Safety, and Environmental Aspects.

Cooperation and Partnerships

The H2Excellence project is constantly cooperating with local and international stakeholders and EU projects related to green hydrogen and fuel cells. The project has reached out the GreenSkills for Hydrogen Project and Hydrogen Europe to discuss potential collaboration on their shared activities. Hydrogen Europe is the European association representing the interest of the hydrogen industry and its stakeholders and promoting hydrogen as an enabler of a zero-emission society.

Networking and Promotional Activities

The project partners are actively involved in the networking and promotional activities.

In 2024, the first dissemination of H2Excellence project was held at Hyvolution Exhibition in Paris, France held from 30th January to 1st February, 2024. Mr. José Paulo, the President of the Board of EnergyIN showcased the H2Excellence project along with other hydrogen projects EnergyIN involved in the exhibition.

H2Excellence project was disseminated at CARE Project's Event at Malaga University (UMA) (Spain) on February 21, 2024. Prof. Olga Guerrero-Perez at UMA presented the main objectives and activities that are being carried out in the H2Excellence project. The project was well disseminated to a wide range of audiences.

H2Excellence was participated at Nordic Hydrogen Week held between 13-15 February 2024 in University of Oulu, Finland. From the H2Excellence project, Dr. Karna Dahal from VAMK, Mrs. Sanna Kangasvieri from VAMIA, and Prof. Tauno Kekäle from Merinova participated in the event and took that opportunity to expand the network

with hydrogen and fuel cell sector players in Finland and overseas and also disseminated the H2Excellence project.

The project was disseminated at World Hydrogen 2024 Summit & Exhibition held at the Rotterdam Ahoy, from, May 12th to May 16th, 2024. One of the organizers of this event was EnergyIN, a partner of H2Excellence project. Mr. José Paulo, the President of the Board of EnergyIN disseminated the H2Excellence project to the large audiences in the event.

H2Excellence also took part in the Connecting Green Hydrogen Europe 2024 (CGHE2024) conference held in Madrid on June 25th-27th, 2024. Prof. Guerrero-Perez at UMA was one of the speakers in the event and presented H2Excellence project activities.

The project also took part at second Italian workshop on Ammonia Energy held at Politecnico di Bari on June 5-6, 2024. The H2Excellence partner, Dr. Giovanni Cinti, from the UNIPG (Italy) presented H2Excellence project and course development on hydrogen energy during the workshop.

The H2Excellence was also promoted in East Asia. The project was disseminated at a "Workshop on international collaboration and student mobility" seminar held at National Taiwan University (NTU), Taiwan. Prof. Perez from UMA presented the H2Excellence project detailing its main objectives, consortium partners, and the definition and importance of Centers of Vocational Excellence (COVE). She also provided insights into the current state of green hydrogen technologies in Europe.

The H2Excellence was also disseminated at ANM2024 conference in Portugal that was held at the University of Aveiro in Portugal from July 24-26, 2024. The conference attracted scientists from 35 countries to present and discuss their cutting-edge research on nanomaterials for hydrogen energy. Dr. Carmen Rangel from LNEG (Portugal) presented and disseminated the H2Excellence project and LNEG's activities at the conference. The conference proved to be invaluable platform for promoting the H2Excellence project to both local stakeholders and global scientific community.

And, this year's Forum on Vocational Excellence was held on 10 to 12 September 2024 in Lyon, France. Several members of the H2Excellence project participated in the Forum, promoted the project, and networked with various stakeholders and partners.

Training and Educational Activities

H2Excellence project partners also actively take part in available training and educational activities related to hydrogen and fuel cells. H2Excellence took part in the

Hydrogen VET Forum that was held on 9-11 May, 2024 at the Circuit of Spa Francorchamps, Netherlands. This two-day event offered a learning experience for teachers in vocational education and training. From H2Excellence project, Dr. Karna Dahal from VAMK, Mrs. Sanna Kangasvieri from VAMIA, and Dr. Roberta Mecozzi from ENEA participated the Forum. For H2Excellence project partners, it was also a great opportunity for networking and disseminating the H2Excellence project.

Deliverables and Milestones

In 2024 until now, the project completed five more deliverables related to European/national/regional hydrogen roadmaps and initiatives, state of the art or the skill gap analysis, guidelines for the project implementation based on promotion of EU shared values, CoVE network and knowledge focus groups activities, and the progress report Month 14.

In addition, the project has accomplished 2 out of 13 milestones until now: 1) state of the art and large-scale hydrogen initiatives across CoVE emerging job needs identified, and sector skills roadmap and 2) hydrogen profiles database completed and both are related to WP2.

Publications

In addition to deliverables, the project has published several publications. A poster presented by H2Excellence partners, ENEA and IPP, at the Waste to Hydrogen conference held in Portalegre on 9-10 November, 2023, is available on the project's website. The second poster presented by H2Excellence partner, LNEG, at the ANM2024 conference is also available on the project's website. Both of these posters are available in the 'Documents' section of the project's website.

In addition, the H2Excellence partner ISQ has released 15 flipbooks featuring Diversity, Equity, and Inclusion

(DE&I) guidelines, developed by fellow partner EEO Group under Task 2.4 of WP2. The flipbooks are available on Publuu website at: <https://h2eflipbooks.publuu.com>. Other publications are on the pipeline.

Hydrogen-powered Car Design Competition

The H2Excellence project organizes several international competitions for different level of students in Vocational Education and Training (VET) organizations and higher academia/Universities. Mondragon University (Spain), one of the 24 partners of the H2Excellence consortium, organizes its first such competition in collaboration with other consortium partners on **the design of a hydrogen radio-controlled car**, which is intended for the students at EQF levels 3–5. More information about the competition is available in the 'Events' section of the project's website.

Other News and Events

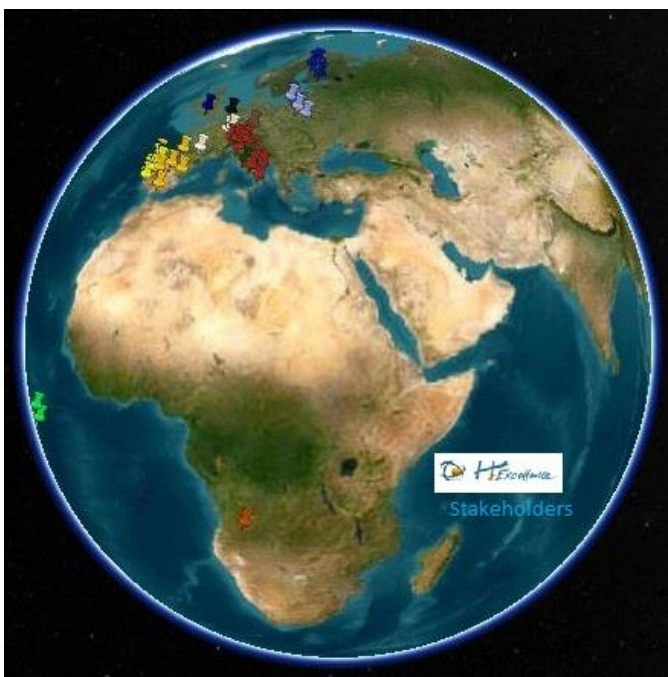
European Hydrogen Week

This year, European Hydrogen Week will be held in Brussels between November 18 and 22, 2024. There will be multiple conference streams with several sessions and a number of speakers will provide speeches to deep dive into all things about hydrogen, from industry trends, challenges and opportunities, innovation, new technology, and more. The more information about the programmes and activities done at the event is available at: <https://euhydrogenweek.eu/>

Useful Links

<https://www.copcov.es/>

<https://hydrogeneurope.eu/>



Establishing the H2Excellence Platform for Vocational Excellence in the field of fuel cells and green hydrogen technologies.

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