



#5

August 2022



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Dear reader,

The **Interreg SI-AT H<sub>2</sub> GreenTECH project** has successfully reached its finish line! The project partners contributed to the establishment of a **hydrogen ecosystem** in the field of green hydrogen and hydrogen technologies in the cross-border area Slovenia-Austria.

The developed **Hydrogen Center**, as a B2B web platform and One-stop-shop, is an integrative facilitator and motivator for finding common solutions with its existing and future **members** that contribute to the improvement of the regional hydrogen ecosystem. It **serves companies**,

**researchers, and students** by providing information, encouraging research and business networks and collaboration opportunities, sharing knowledge, and improving the flow of innovation in the cross-border area. Two strategic documents to support and guide the further development of the Hydrogen Center were prepared.

The knowledge of green hydrogen technologies and fuel cells led to the development of **demonstration models** in the form of small mobile units. They **enable the testing of fuel cell prototypes and methods** for companies and other stakeholders. They are also used for **educational purposes and in laboratory exercises** to practically demonstrate to students the possibility of using hydrogen as a fuel instead of fossil fuels.

An important result for further cooperation is also the policy document - **Roadmap for Hydrogen Technologies in Slovenia and Austria**, which provides a solid basis for strategic decisions of the participating countries regarding hydrogen technologies.

We hope that you will **share our project results** with anyone who is interested in hydrogen technologies and may find them relevant and useful to expand cooperation for the **development of green hydrogen** through future activities of the Hydrogen Center!

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# 1

## HYDROGEN CENTER

Center v obliki [B2B platforme](#) in [enotne vstopne točke](#) je namenjen povezovanju in izboljšanju dostopa in rabe raziskovalne infrastrukture H<sub>2</sub> tehnologij za podjetja, raziskovalce in študente.

Das Zentrum dient als [B2B-Plattform](#) und [zentrale Anlaufstelle](#) zur Vernetzung und Verbesserung des Zugangs für Unternehmen, Forschende und Studierende; zur Nutzung von Wasserstoffforschungsinfrastruktur.

The Center in a form of a [B2B online platform](#) and [one-stop shop](#) improves the access and use of research infrastructure on H<sub>2</sub> technologies for companies, researchers, and students.



Marketing strategy for a Hydrogen Center [\[SL\]](#) [\[DE\]](#) [\[EN\]](#)



Development strategy for Hydrogen Center in Cross-Border region INTERREG Slovenia and Austria – From innovation environment to innovation ecosystem [\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

# 2

## H<sub>2</sub>GreenTECH DEMONSTRATION MODELS, EDUCATIONAL CONCEPT & PROTOCOLS

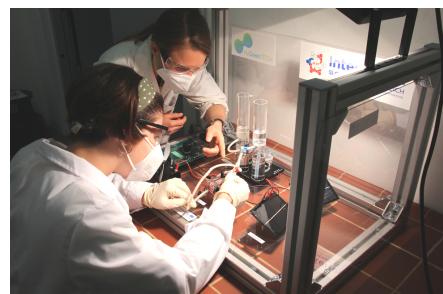
Avstrijski in slovenski partnerji iz raziskovalnega sektorja so razvili **demonstracijske modele**, ki jih je mogoče uporabiti pri osnovnih raziskavah kakor tudi pri razvoju gorivnih celic, in vključujejo sistemsko vidike nadzora H<sub>2</sub> tehnologij. Demonstracijski modeli so integrirani v nov koncep*t poučevanja o H<sub>2</sub> tehnologijah*, ki je brezplačno na voljo zainteresiranim deležnikom in univerzam v Avstriji in Sloveniji.

V projektu sta bila razvita tudi dva protokola. **Protokol A** je tehnološki protokol demo modelov H<sub>2</sub>GreenTECH, v **Protokolu B** je prikazana raziskovalna infrastruktura partnerjev.

Österreichische und slowenische Forschungspartner haben **Demonstrationsmodelle** entwickelt, die sowohl für die Grundlagenforschung als auch für die Brennstoffzellenentwicklung einschließlich der Aspekte der Systemsteuerung von H<sub>2</sub>-Technologien geeignet sind. Die Modelle sind in ein neues **Lehrkonzept** integriert, das interessierten Akteuren und Universitäten in Österreich und Slowenien kostenlos zur Verfügung steht.

Ein weiterer Schwerpunkt des Projekts war die Entwicklung von **zwei Protokollen**. **Protokoll A** ist ein 'Technologisches Protokoll' der H<sub>2</sub>GreenTECH-Demomodelle und **Protokoll B** fasst die Infrastruktur der Partner zusammen.

Austrian and Slovenian research partners have developed **demonstration models** applicable to both basic research and fuel cell development including the system control aspects of H<sub>2</sub>-technologies. The demonstrators are integrated into a new **teaching concept**, which is available free of charge to interested stakeholders and universities in Austria and Slovenia. Another focus of the project was the development of **two protocols**. **Protocol A** is a "technological protocol" of the H<sub>2</sub>GreenTECH demo models and **Protocol B** summarizes the partners' infrastructure.

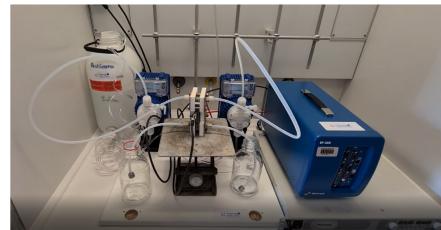


H<sub>2</sub>GreenTECH demo - educational model - **control unit** (FH Kärnten) [\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

*Warmuth A. et. al, Green future with hydrogen technologies - a new teaching concept, 2022* [>>>](#)

H<sub>2</sub>GreenTECH demo model - **PEM fuel cell** (TU Graz) [\[SL\]](#) [\[DE\]](#) [\[EN\]](#)





H<sub>2</sub>GreenTECH demo model  
- **electrolysis** (National Institute of Chemistry)  
[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

## 3

### ROADMAP FOR HYDROGEN TECHNOLOGIES IN SLOVENIA AND AUSTRIA

[Akcijski načrt za spodbujanje vodikovih tehnologij v Sloveniji in Avstriji](#) je skupni čezmejni strateški dokument, ki upoštevajoč trenutne smernice in prioritete obeh držav vključuje napovedi za razvoj H<sub>2</sub> tehnologije do leta 2025.

V dokumentu je naveden niz **tehnoloških izzivov**, vključno s proizvodnjo, distribucijo, skladiščenjem H<sub>2</sub> in pripadajoče infrastrukture, končno uporabo ter izzive, povezane z [vprašanji sodelovanja](#) v čezmejni regiji Avstrije in Slovenije. Poleg tega je predlagan **niz priporočil** vključno z izboljšanim [prenosom znanja in tehnologije](#) med akademskimi krogi, raziskovalnimi organizacijami, industrijo in javnostjo, povečanim financiranjem raziskav in razvoja H<sub>2</sub> tehnologij. Prav tako so bile določene nove spodbude in prednostne naloge za oblikovanje [podpornega političnega okvira](#).

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Der [Aktionsplan zur Förderung von Wasserstofftechnologien in Slowenien und Österreich](#) ist ein gemeinsames grenzüberschreitendes Strategiedokument, das unter Berücksichtigung der aktuellen Leitlinien und Prioritäten beider Länder Prognosen für die Entwicklung der Wasserstofftechnologie bis 2025 enthält.

Das Dokument identifiziert eine Reihe von **technologischen Herausforderungen**, einschließlich Produktion, Verteilung, Speicherung von Wasserstoff und die damit verbundene Infrastruktur und Endnutzung, sowie Herausforderungen im Zusammenhang mit [Frage der Zusammenarbeit](#) in der Grenzregion Österreich und Slowenien. Darüber hinaus wird [eine Reihe von Empfehlungen](#) vorgeschlagen, darunter ein verbesselter [Wissens- und Technologietransfer](#) zwischen akademischen Kreisen, Forschungsorganisationen, der Industrie und der Öffentlichkeit, eine verstärkte Forschungsfinanzierung und die Entwicklung von Wasserstofftechnologien. Auch für die [Schaffung eines unterstützenden politischen Rahmens](#) wurden neue Anreize geschaffen und Prioritäten gesetzt. >>>

cross-border strategic document that refers to the expected development of H<sub>2</sub> technology until 2025 through current guidelines and priorities in the two countries.

A set of **technological and cooperation challenges** is listed, including the production, distribution, and storage of H<sub>2</sub> as well as associated infrastructure, end-uses, and cooperation issues in the cross-border region of Austria and Slovenia. Further, a set of **recommendations** is proposed, including **improved knowledge and technology transfer** between academia, research organizations, and industry and to the public, an increase in financing of R&D for H<sub>2</sub> technologies, also new incentives and priorities have been established to create an **encouraging policy framework.** [>>>](#)

## EVENTS



### H<sub>2</sub>GreenTECH Final Conference

[\[SL\]](#) [\[DE\]](#) [\[EN\]](#) [>>>](#)



### Traveling exhibition Hydrogen Center

[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

### H<sub>2</sub>GreenTECH Demonstration tours

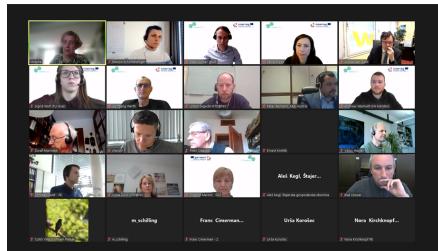
for students, researchers, entrepreneurs, and journalists: April 2022 (Slovenia), May 2022 (Austria) [>>>](#)



**European Researchers` night  
2022 (Austria)**

FH Kärnten & Forschung Burgenland  
[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

TU Graz  
[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)



**H<sub>2</sub>GreenTECH Policy Forum 2022**  
[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)



**Presentation Video H<sub>2</sub>GreenTECH**  
[\[SL\]](#) [\[DE\]](#) [\[EN\]](#)

**#2 H<sub>2</sub>GreenTECH Brochure**

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## PARTNERJI

## PARTNERS

## PARTNER



NATIONAL INSTITUTE  
OF CHEMISTRY

dr. Blaž Likozar, Head of Department of  
Catalysis and Chemical Reaction  
Engineering, Project Coordinator



REPUBLIC OF SLOVENIA  
MINISTRY OF EDUCATION,  
SCIENCE AND SPORT

dr. Peter Kumer, Science Directorate, Project  
Manager



ŠTAJERSKA  
GOSPODARSKA  
ZBORICA

dr. Dragica Marinič, Head of Project  
Management Office, Project Manager



Dr. Viktor Hacker, Institute of Chemical  
Engineering and Environmental Technology,  
Project Manager



Dr. Christian Heschl, Project manager



Dr. Wolfgang Werth, Project Manager



h2greentech@gmail.com

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Kemijski institut  
Hajdrihova 19  
Ljubljana 1000  
Slovenia

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