THE HyEfRe NEWSLETTER

HYDROGEN INTEGRATION FOR EFFICIENT RENEWABLE ENERGY SYSTEMS

ABOUT THE PROJECT:

Sector-coupling is a promising approach to replace fossil fuels with renewables. However, this idea of "electrifying" the entire economy requires the rollout of new technologies and rules. **The HyEfRe project helps with this by establishing green hydrogen ecosystems in eight regions.** The partners foster an investment-friendly environment for renewable energy and green hydrogen technologies. They evaluate hydrogen potentials with a new model and develop and test a new tool to calculate ideal parameters for technical plants. Their action plan for policy actors will reduce regulatory barriers impeding a timely expansion of renewables and green hydrogen.

CONTENTS:

Interreg CENTRAL EUROPE
Co-funded by the European Union
HyEfRe

START DATE: JUNE 2024
END DATE: NOVEMBER 2026

Pilot tests show how Central European regions can prepare for a cleaner energy future

How can regions make better use of renewable energy and reduce their dependence on fossil fuels? This question in at the heart of the HyEfRe project, which tested an innovative Hydrogen Potential Model (HPM) in three very different Central European regions: Šaleška in Slovenia, Mazovia in Poland, and Pécs in Hungary.

How can regions make better use of renewable energy and reduce their dependence on fossil fuels? This question in at the heart of the HyEfRe project, which tested an innovative Hydrogen Potential Model (HPM) in three very different Central European regions: Šaleška in Slovenia, Mazovia in Poland, and Pécs in Hungary.

The project aims to identify where and how green hydrogen can be produced from renewable electricity. Green hydrogen can store surplus energy from solar and wind power and later be used in industry, transport, heating, or electricity generation. This makes it an important tool for balancing energy systems and reducing greenhouse gas emissions.

In spring, 2026, at the centre of the pilot activities was the Hydrogen Potential Model (HPM), a web-based decision-support tool developed within the project. The tool helps users estimate how much green hydrogen could be produced from renewable energy sources in a specific region and what infrastructure would be needed. By combining hourly data on electricity demand and renewable energy generation, the HPM identifies surplus renewable electricity that could be converted into hydrogen. Users can create and compare different future scenarios, such as adding new solar or wind capacity or changing market assumptions. The tool automatically calculates key indicators, including hydrogen production volumes, investment costs, operating costs, and expected payback periods. One of its main advantages is that it makes advanced energy modeling accessible to municipalities and regional planners without requiring specialist technical knowledge.

At the centre of the pilot activities was the Hydrogen Potential Model (HPM), a web-based decision-support tool developed within the project. The tool helps users estimate how much green hydrogen could be produced from renewable energy sources in a specific region and what infrastructure would be needed.

HyEfRe's pilots showed that hydrogen can be a mass-production opportunity in a former coal region like Slovenia's Šaleška Valley, a backup energy lifeline for a Warsaw hospital, and a long-term decarbonisation option for a city like Pécs—all depending on local conditions.

Different regions, different opportunities

One of the most interesting findings of the pilot testing was that hydrogen opportunities depend on much more than just renewable energy resources. In the Slovenian Šaleška region, a planned large floating solar power plant on Družmirje Lake dramatically increased the region's hydrogen production potential. The study showed that a former coal-dependent area could become an important producer of green hydrogen if renewable energy investments are implemented. Existing infrastructure from the former coal industry, such as grid connections and industrial sites, could help speed up this transition. The pilot in Mazovia, centered around a major hospital in Warsaw, demonstrated a different use of hydrogen. Because space for renewable energy production is limited in dense urban areas, large-scale hydrogen production is more difficult. However, hydrogen proved valuable as a solution for energy security and emergency power supply for critical infrastructure such as hospitals. Pécs represented a middle-ground example. The city has promising renewable energy resources and potential industrial applications for hydrogen, but it also faces challenges related to limited surplus renewable electricity and still-developing market demand. The pilot confirmed that hydrogen could become an important part of the city's long-term decarbonization strategy.

Data matters more than expected

Across all three regions, one lesson became very clear: collecting reliable energy data was often more challenging than running the model itself. The HPM requires detailed hourly information on electricity consumption and renewable energy production. Obtaining, cleaning, and preparing this data required significant effort and cooperation with energy companies and other stakeholders. The pilots showed that high-quality data is essential for producing reliable results and that data preparation is often the most time-consuming step in hydrogen planning.

Interreg CENTRAL EUROPE
Co-funded by the European Union
HyEfRe

A practical tool for decision-makers

The pilots confirmed that the HPM can be a valuable tool for municipalities, regional authorities, and development agencies. Users were able to create different future scenarios and compare how changes in renewable energy capacity, energy demand, or hydrogen prices affected project feasibility. Importantly, the model was designed for non-experts. Users appreciated its straightforward interface and the ability to explore different development options without needing advanced modeling knowledge. At the same time, the testing highlighted areas for improvement, including easier scenario management, clearer presentation of assumptions, and stronger support for data preparation.

Looking beyond technology

Perhaps the most important conclusion from the pilot activities is that successful hydrogen projects depend not only on technology but also on local conditions. Infrastructure, regulations, stakeholder cooperation, data availability, and regional development priorities all play a major role in determining whether hydrogen projects can move from ideas to reality. The HyEfRe pilots demonstrated that hydrogen can support regional energy transitions in different ways: by enabling economic transformation in former coal regions, improving resilience in cities, and helping medium-sized regions achieve their climate goals. By providing a practical, data-driven planning tool, the project has taken an important step toward helping Central European regions identify realistic pathways for integrating green hydrogen into their future energy systems.

Interreg CENTRAL EUROPE
Co-funded by the European Union
HyEfRe

Let's synergise: GreetCE and HyAdvanCE

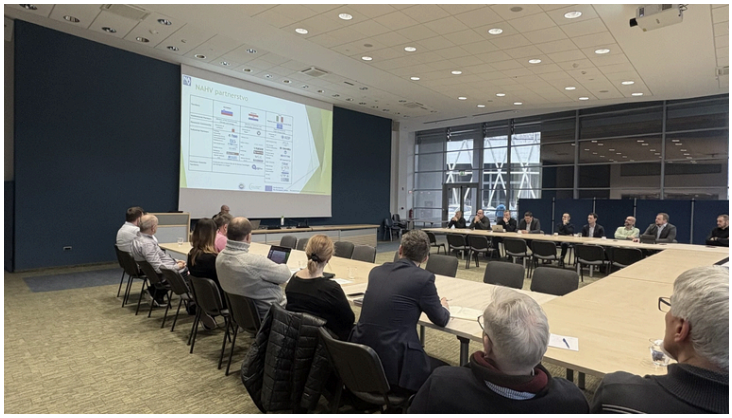
HyEfRe is not only delivering its own pilot results, but also actively shaping a wider hydrogen ecosystem through close cooperation with projects like GreetCE and HyAdvanCE. Together, these initiatives help move hydrogen from individual case studies to coordinated regional strategies, tools and investments across Central Europe.

How HyEfRe and GREET CE joined forces in the Šaleška Valley, Slovenia

In Slovenia, in the HyEfRe pilot region of the Šaleška Valley, HyEfRe developed a close synergy with the **GreetCE** project. GREET CE is an EU I3 project that strengthens bioeconomy and green-transition innovation ecosystems for SMEs in less developed Central European regions. One of its specific focuses is hydrogen: one of GREET CE's pilots targets renewable gases, particularly green hydrogen, as a key technology for regional green transition. With this in mind, GREET CE organised several events in the Šaleška Valley to help regions and SMEs design bankable green-transition investments. These events created an ideal setting to present HyEfRe hydrogen tools and business models. Together, GREET CE offers a broad platform of SMEs, clusters, investors and public authorities, while HyEfRe provides practical methods and tools, positioning hydrogen not as a stand-alone niche, but as an integral part of the region's wider green-transition portfolio.

Within **GreetCE**, another high-profile event was hosted: **"Hydrogen 2026: Connecting companies for the development and submission of hydrogen projects."** The event took place at KENT – Termoelektrarna Šoštanj (TEŠ) in Šoštanj, the HyEfRe pilot location. At this event, KSSENA presented HyEfRe's planning tools, business-model approaches and pilot concepts to a highly relevant audience. The event brought together representatives of hydrogen-related industries and companies, technology providers, research institutions and regional development bodies, ensuring direct engagement with key stakeholders. TEŠ, as the main energy hub of the Šaleška pilot region and a key partner in developing the Šaleška hydrogen hub, provided an ideal setting and helped firmly embed HyEfRe results into the emerging concept of the Šaleška hydrogen valley.

The benefits were clear: authorities received aligned policy messages and concrete solutions they could adopt; businesses and SMEs gained clearer information on future framework conditions and opportunities in hydrogen and waste heat; and researchers and educators gained additional material and contacts for further work. By coordinating communication and stakeholder engagement with GREET CE, HyEfRe strengthened the visibility, credibility and practical uptake of results from both projects.



"Hydrogen 2026: Connecting companies for the development and submission of hydrogen projects"

HyAdvanCE will scale up HyEfRe's tools across Central Europe

HyAdvanCE is an upcoming Interreg Central Europe capitalisation project that will build on the results of several earlier hydrogen projects. It will help regions work together across borders to accelerate hydrogen planning, strengthen energy transition strategies and make hydrogen solutions more practical and accessible for regional public authorities, energy and infrastructure providers and other stakeholders. At the heart of HyAdvanCE is the **Hydrogen Toolbox**, a hands-on framework that brings together planning methods, decision-support tools and pilot-tested approaches for hydrogen deployment. The project will also develop cross-border hydrogen strategies and integrate its results into the **H2CE** collaboration platform, ensuring that the knowledge and experience generated remain available well beyond the project lifetime.

The HyAdvanCE project capitalises on the results of numerous projects funded under the Interreg Central Europe Programme, with a particular focus on the outcomes of the HyEfRe project. It will employ a hydrogen ecosystem strategy, pilot actions, and a systems-thinking model, aligning them with a broader cross-border spatial and infrastructure strategy for hydrogen. Furthermore, it will use the Hydrogen Potential Model and Decision Support Tool from HyEfRe project as important building blocks for the unified Hydrogen Toolbox and for more informed hydrogen planning.

With its implementation soon to begin, HyAdvanCE offers a timely opportunity to turn proven outcomes and results into wider impact. The project is set to support stronger hydrogen ecosystems, better policy alignment and a more integrated energy future across Central Europe.

HyEfRe's bussiness model list: a leaflet

HyEfRe project has released a new leaflet presenting key business models for hydrogen hubs in Central Europe.

The leaflet clearly outlines five main archetypes, including industrial decarbonisation anchor models, integrated port and logistics hubs, transnational corridors and backbones, captive mobility fleet hubs, and decentralised supply and system service hubs.
The brochure serves as a practical orientation framework for public authorities, municipalities, industry, infrastructure operators and investors when selecting the most suitable model based on local context, available resources, demand and supply profiles, investment structures and expected economic, environmental and social impacts. It is particularly useful for regions aiming to link existing energy infrastructure, hard-to-abate sectors and new opportunities for renewable hydrogen.

We invite you to explore the leaflet and reflect on which business model could be the best fit for your region or organisation.

JOIN US!

Discover more about our initiatives and updates on **HyEfRe** webpage and social networks

Like and Follow us on:

www.facebook.com/HyEfReCE

www.linkedin.com/company/hyefre/

x.com/HyEfReCE

www.interreg-central.eu/projects/hyefre/

Interreg CENTRAL EUROPE

Co-funded by the European Union

HyEfRe