

EReTech

Electrified Reactor Technology

Newsletter - 30th JUNE 2023



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Welcome from the EReTech Coordinator

With the Green Deal, the European Union has set itself the goal of becoming greenhouse gas neutral by 2050. To achieve this goal, energy-intensive production processes in the chemical industry - such as those used to produce hydrogen - are to be replaced by new, sustainable and carbon-neutral processes. **EReTech** goal is to build a pilot plant for hydrogen production from biogas based on a new technology that is expected to drastically reduce the energy required for hydrogen production compared to conventional technologies. This will be achieved by integrating resistive heating into the chemical



reactor. **EReTech** project is funded by the EU and involved 14 partners from science and industry, and it is coordinated by the Technical University of Munich (TUM).

This newsletter aims to inform a wider audience about the main **EReTech** project achievements and the future impacts of the project results on industries and society. Stay tuned for the last developments and enjoy the newsletter reading.

Stay Tuned!

[Johannes Lercher](#) - EReTech coordinator, Technical University of Munich (TUM) Germany

The EReTech project breakthrough

Why EReTech?



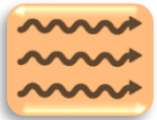
EReTech will develop, build and operate a fully electrified reactor especially suited to achieve highly endothermic reactions. This reactor will form the core of an integrated modular hydrogen production plant that will be able to **directly upgrade raw biogas into renewable hydrogen**. The decentralized and evenly distributed existence of biogas plants across Europe will boost the development of the hydrogen economy,

facilitating its supply, while offering lower transport and infrastructure costs and unprecedented utilisation of electrical power.

Challenges



Need for safer design and certification. The introduction, operation and commercialization of hydrogen-producing equipment and the related infrastructure must be done safely, the properties and safety challenges related to the electrified high-pressure and temperature reactors like the one developed in EReTech are very different from conventional equipment.



One of the biggest challenges in the standard reactor is the **efficient and reliable heat transfer to the reforming catalyst.**

Objectives



A **new catalyst** that can be used in an electrically heated reactor combining steam and dry reforming will be developed.



An **intensified reactor design** characterized by 100 times higher power per volume compared to traditionally fired reformers (20 MW/m³ vs 0.03 MW/m³).



The design and the validation of a **small-scale renewable H₂ producing plant** (approximately 400 kg/day), that consumes one-third electricity compared to alternative water electrolysis (~14 kWh/kgH₂ vs. ~55 kWh/kgH₂)

Impacts



Operationally safer and robust electrically heated reformers that simplify process design and lead to **lower CO₂-emissions and OPEX.**



EReTech solution will also impact the **civil engineering** costs related to foundations, pipe supports, and access platforms. The plant design will be developed for centralized application and will decrease the amount of on-site construction work, and **lowers costs for manpower, safety, and site management.**

Project Consortium

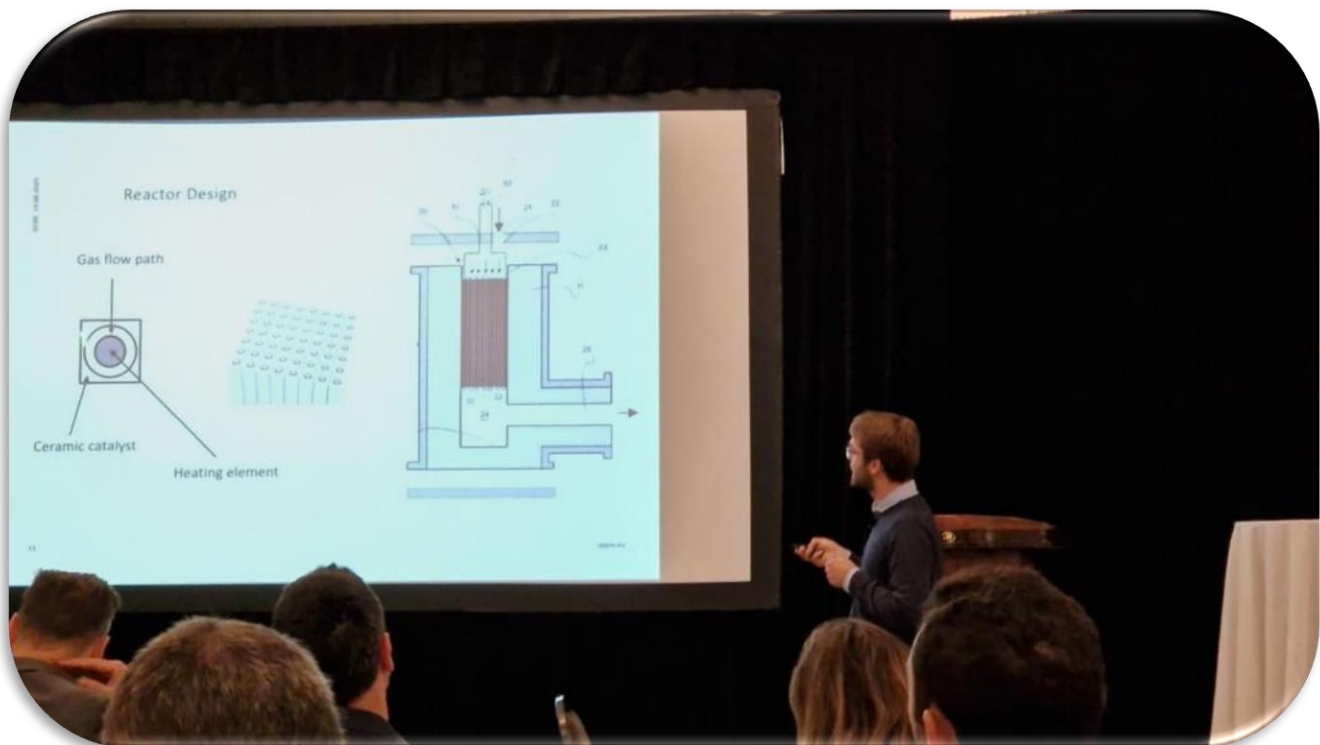
The Consortium involves eight companies, four higher-education establishments and two research institutions, with complementary competencies. The multidisciplinary approach and the focus on industrialization are expected to be a unique added value for EReTech project. For these reasons, EReTech consortium has 8 business partners eager to bring the results of this project into the market.

EReTech EVENTS

ISCRE 23: Chemical Reaction Engineering for Sustainable Development.

Meeting the world's demands for energy, food, water, and medicine – in a sustainable way, while protecting the environment – requires the development of new technologies and advanced materials. The theme of [ISCRE27](#) aimed to capture the essential role that Chemical Reaction Engineering (CRE) plays in addressing these challenges.

Our partner SYPOX participated with SYPOX CEO [Gianluca Pauletto](#), (in the picture) who gave a keynote talk on electrification for hydrogen production.



Gianluca reported that was thrilling to see the insane amount of work going into reactor electrification. The engineering community and big industrial players have fully understood its importance, and many talented people are working hard to drive it forward.

Huge developments are coming and EReTech is on its way to successfully face the challenge!

12th Months Hybrid MEETING



1° YEAR MEETING - 1st JUNE 2023 THESSALONÍKI (GR)



Josef Kerner
Energiewirtschafts-GmbH

Brightlands

ETH zürich

bayerngas
Energiepartnerschaft mit Zukunft



On June 1st 2023, EReTech partners attended the 12 Month Meeting in Thessaloniki organized by our partner [CERTH](#), participating with presentations on project activities and discussions on how to achieve the best outcomes and project results. Additionally, all partners contributed to future project developments and decisions in order to complete successfully foreseen activities and tasks. Activities and achievements are confidential! Stay tuned and follow the project's progress on our social media!

EReTech [website](#)

