Federal Ministry
Innovation, Mobility
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H2 für die Luftfahrt

Grüner Wasserstoff für die Luftfahrtindustrie

Malek Ibrahim
REDEEM Solar Technologies GmbH
Vienna, 12.11.2025

Brief description of the consortium partners

Sondierung
12 Mo
Aug. 2023 – Jul. 2024
4 partners

REDEEM SOLAR TECHNOLOGIES

Project coordinator, reactor design, TEA

HyCentA

Computational Fluid Dynamics (CFD)

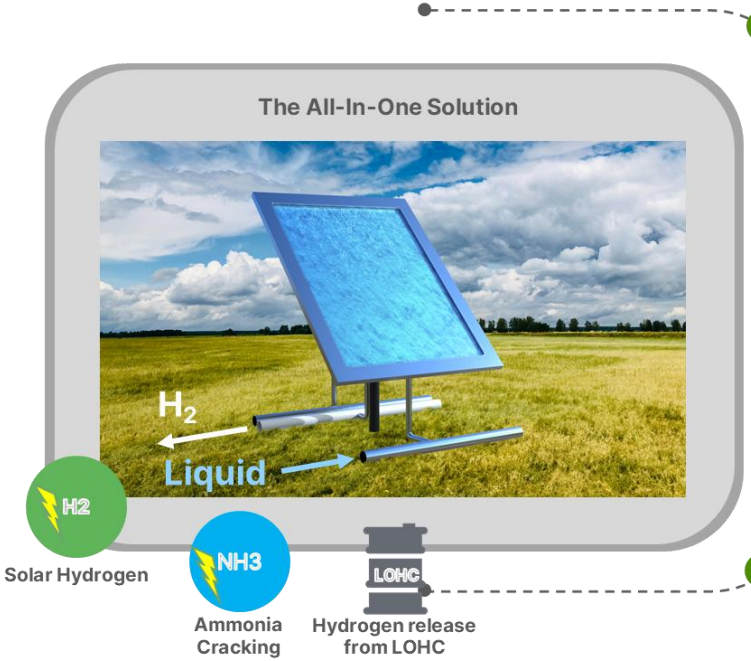
RHP GROUP

Stress Analysis & Machining

TU WIEN

Catalyst Characterization

Aim of the project / Background of the project



1 Solar to H2 conversion

30% cheaper than Electrolysis

On-demand, On-site

Various hydrogen sources

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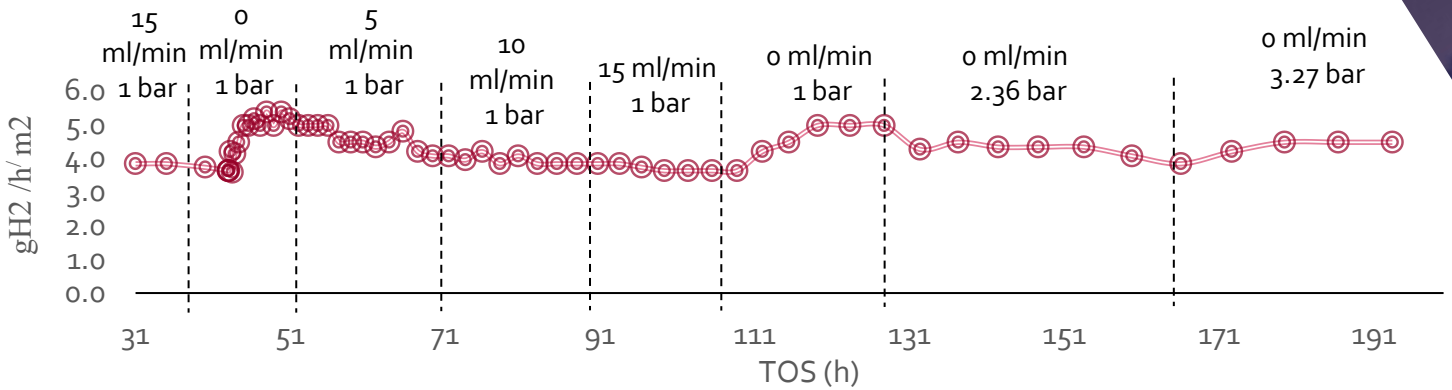
Project results

- Optimized **reactor design** (4 g H_2/m²/h)
- Validated **photocatalyst performance** (6 sources of hydrogens)
- Demonstrated **reactor stability** (200 h test)
- **Scaled-up hydrogen evolution testing** (1600 cm²)
- **Technoeconomic analysis** (3 aviation-related hydrogen applications)



Utilization of the project

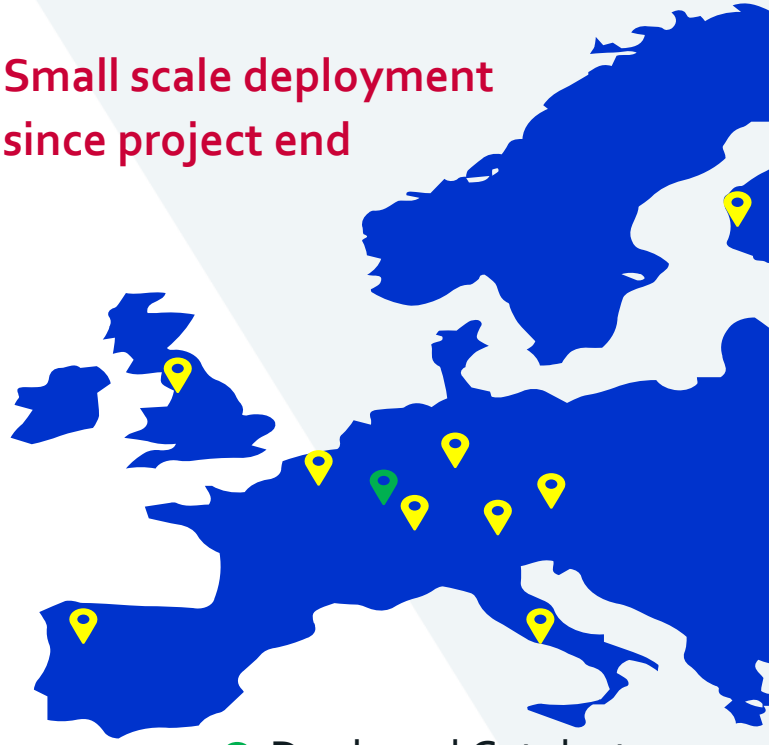
Use case	Scale	Kg H2/day	€/kg H2
Hanger heating	25,000 m³, 5 C to 15 C	30	8.3
Surveillance drone	2 flights/day	0.6	12.7
eVTOL	1 flight/ day	1.8	10

Enhanced photocatalytic hydrogen production efficiency using urea-derived carbon nitride in a continuous flow reactor†

From the journal:
Sustainable Energy & Fuels

Samar Batool, [a] Malek Y. S. Ibrahim, [*a] Florian Ehrlich-Sommer, [a] Stephen Nagaraju Myakala, [b] Shaghayegh Naghdi [b] and Alexey Cherevan [b]

Small scale deployment since project end



Further steps/(potential) follow-up projects

- Current Follow-up Projects:

  ✓ Increase productivity: (4⟶ 7 g H_2/m²/h via KAT-PAWS project FFG no. 914901)

  ✓ Better coating stability: SAHARA (The Clean Energy Transition Partnership)

- Potential Follow-up projects:

  ❑ Coupling H2 production ↔ Consumption for one aviation application

  ❑ Photocatalytic SAF production/upgrading with the developed reactor