Project description

Natural disasters, ranging from floods and storms to earthquakes and wildfires, are becoming more frequent and intense, and are increasingly threatening **critical infrastructure**. The electrical power supply is among the most vital of these systems. If it fails, this can trigger cascading effects across all sectors, from healthcare and communication to emergency services.

This project strengthens the **resilience** in case of natural disasters by development of an innovative transportable fuel cell system capable of running on both **methanol** and **hydrogen**. This dual-fuel mode ensures an uninterrupted power supply when it is needed most. By use of this RESCUE system, **base of operations** are not dependent on a concrete type of fuel for power supply in disaster areas and are able to act independently and at short notice.

The **containerized HT-PEM fuel cell system** provides a reliable 50 kW power output and is going to be intensively tested towards technical relief considering disaster scenarios.

In the event of a natural disaster, the RESCUE system ensures autonomous power supply for the base of operations

About Clean Hydrogen Partnerhship

The Clean Hydrogen Partnership is supporting research and innovation (R&I) activities in hydrogen technologies in Europe. It aims to accelerate the development of advanced clean hydrogen applications ready for market, across end-use sectors such as energy, transport, building and industry, while strengthening the competitiveness of the clean hydrogen value chain. The members of the partnership are the European Commission, fuel cell and hydrogen industries represented by Hydrogen Europe and the research community represented by Hydrogen Europe Research.

Clean Hydrogen Partnership

Co-funded by the European Union

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https://project-rescue.eu

LinkedIn:
https://www.linkedin.com/company/rescue1

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TT-ECE-0725_RESCUE

RESCUE

Reliable and Efficient Dual Fuel System for Civil Protection during Natural Disasters

Clean Hydrogen Partnership

Co-funded by the European Union

Project RESCUE with Grant Agreement number 101192169. This project is supported by the Clean Hydrogen Partnership and its members. Co-funded by the European Union.

Overview

- Development and demonstration of an advanced fuel cell system operating on 100% hydrogen and methanol
- 50 kW of continuous electrical power and up to 100 kW peak power
- Robust performance in demanding conditions

Call:
HORIZON-JTI-CLEANH2-2024

Type of Action:
HORIZON JU Innovation Actions

Acronym:
RESCUE

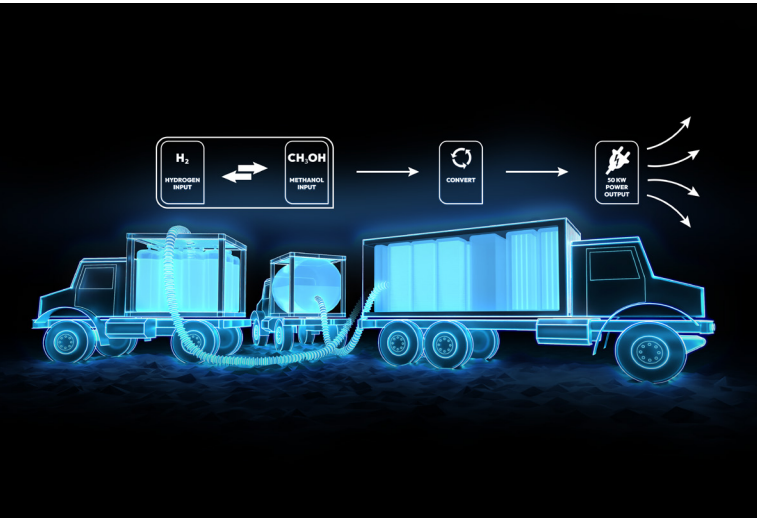
Number:
101192169

Duration:
48 months

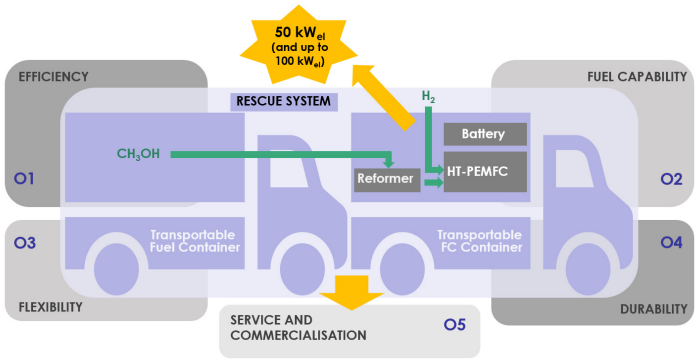
Start Date:
01 Jan 2025

Max. Grant Amount:
4,983,490.08 €

Containerized HT-PEM fuel cell system with a reliable 50 kW power output and dual-fuel capability for operation with methanol or hydrogen



Objectives



Efficiency

- FC system power of 50 kW_{el} with 100 kWel system peak power
- Efficiency (fuel to electricity) ≥ 50 %

Fuel Capability

- Use of 100 % hydrogen or methanol with fast fuel exchange
- Methanol capacity for two weeks

Flexibility

- Fast start-ups of max. 10 min or 70 min and additional zero-load operation
- Robustness towards ambient T and p, vibrations and brownouts etc.
- Longer operation times than batteries or diesel generators (100 % or 20 %)

Durability

- Availability ≥99 % during 2,000 h
- System lifetime ≥10,000 h
- FC degradation rate during 1,000 h ≤50 µV h^{-1}

Service and Commercialisation

- Digital tools and plug & play
- Maintenance every 5,000 h
- System costs ≤2,800 € kW_{el}^{-1}
- Standard container sizing for transports
- Usability and safety with certification

Consortium

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center
https://www.DLR.de/en/

Project coordination, MEA testing towards fuel switching, system testing in lab environment

ADVENT
https://advent.energy/

System development, fuel cell unit and container design and setup

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS
www.certh.gr

System development, fuel cell unit design and testing, fuel container design

DTU
https://www.energy.dtu.dk/

Modelling towards thermal management

PROACT
https://www.proact.gr/

HAZOP lead, safety requirements, certification of system and transport

Technisches Hilfswerk
www.thw-forschung.de

End user requirements, system field testing with natural disaster scenarios