Demo4Grid
Demonstration of a 4 MW Large Scale Pressure Alkaline Electrolysis for Grid Balancing Services
GREEN HYDROGEN
GREENING OF INDUSTRY
Project Partners

Greece
- Diadikasia

Switzerland
- IHT Industrie Haute Technologie SA

Spain
- FHA Fundación Hidrógeno Aragón
- instrumentacion y componentes SA

Austria
- MPreis Warenvertriebs GmbH
- FEN Sustain Systems GmbH
Project Details

- **Project reference:** 736351
- **Topic:** FCH-02-7-2016 Demonstration of large-scale rapid response electrolysis to provide grid balancing services and to supply hydrogen markets
- **Project type:** Demonstration
- **Start date:** Wednesday, March 1, 2017
- **End date:** Monday, February 28, 2022
- **Duration:** 60 months
- **Project cost:** 7,736,682.50 €
- **Project funding:** 2,932,554.38 €
- **Coordinator:** DIADIKAΣIA SYMVOULOI EPICHEIRISEON AE
The Scope of Demo4Grid

Demonstration of a large-scale electrolysis unit with 4 MW using pressurized alkaline technology to provide grid balancing services and supply hydrogen for the long term business model of MPReis with:

- a long term perspective for use of the installation after the project using the produced hydrogen as industrial gas, transport fuel or power-to-gas
- a sufficiently rapid response time of 2 seconds and the possibility of operation under partial load
- the participation in the existing primary and secondary grid balancing markets
- demonstration of the benefits from grid services revenue streams and power price opportunities
- an energy performance of less than 52 kWh per kg$_{H2}$
- CAPEX of 630 € per kW respectively 2.5 million €
Demonstration Site at MPreis
Demo4Grid – Short Term Business Model

Grid Services

max. 35 GWh/a

Electrolyser 4 MW

Green Hydrogen

Inverter

ELECTROLYSIS

H₂

STORAGE

33 bar

H₂ Pressure Tank

H₂ Burner

Heat Exchanger

max. 21 GWh/a

Bakery Butchery

Food Production

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Demo4Grid – Long Term Business Model

**Grid Services**
- KW Sellrain Regional Hydro Power Plant
- 10 MW, 40 GWh/a
- max. 35 GWh/a

**Green Hydrogen**
- Electrolyser 4 MW
- Electrolysis
- Storage
- H₂ Pressure Tank
- H₂ Burner
- Heat Exchanger
- 1600 to 1800 kg H₂ per day

**Public Transport**
- 30 to 50 FCE-Busses

**Private Mobility**
- 300 to 500 FCEV’s

**Food Production**
- Bakery
- Butchery
- H₂ Burner
- H₂ Pressure Tank
- H₂

**MPREIS Logistics**
- 30 to 50 FCE-Trucks

**Fossil World**
- Oil, Coal, Gas, CO₂, Dust, Noise

**Green World**
- Sun, Water, Wind, No CO₂, Dust, Noise

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Expectations

- Demonstrate feasible operation of large scale rapid response electrolysis
- Implement the necessary grid interfaces to provide grid balancing services
- Techno-economic analysis of the performance of these systems
- Projections of the value and size of the markets addressed by provision of the grid balancing services and supply to multiple hydrogen markets
- Assessment and operation experience of the contractual and hardware arrangements required to access the balancing services and operate the electrolyser systems
- Assessment and operation experience, including safety, of the contractual and hardware arrangements required to distribute and supply hydrogen to multiple markets such as industrial gas, transport fuel and/or power-to-gas
- Assessment of the legislative and RCS implications of these systems and any issues identified in obtaining consents to operate the system
- Recommendations for policy makers and regulators on measures required to stimulate the market for these systems