

TECHNOLOGY DETAILS

Technology: Fuel Cell micro-CHP using polymer electrolyte membrane

Value chain: Cogeneration
Sub-sector or technology: Heating and cogeneration
Sector: Buildings

Demand/Supply/Infrastructure: Demand

TRL 2023: 9

According to IEA criteria, the TRL of this technology in 2022 was: **9**

TECHNOLOGY DESCRIPTION

Electrochemical system which consists of a reformer and PEM fuel cell stacks operating at temperatures up to 80°C. Before being introduced to the reformer, fuel is desulphurized. There are two types of Fuel cell micro-CHP systems depending on the fuel applied. Natural gas or Propane can be applied. They need a back-up option for peak heat demand. Load following modulation.

KEY COUNTRIES

Japan, Europe, United States, Korea

PROTOTYPE OR DEMONSTRATION PLANS, DEDICATED INVESTMENTS, LEADING INITIATIVES

Ene.field project (2011-2017), Europe

PACE project (Pathways to a Competitive European FC MCHP market), (2016-2021)

Cogeneration Act, Germany

Fuel Cell and Hydrogen Energy Association

ENE-FARM Japan: Large-scale Demonstration Research Project (2006-2009) Introduction subsidy (2009-2018)

DEPLOYMENT TARGETS

Japan: The Strategic Energy Plan was updated in 2021. Development target in 2030 is 3 million units in 2030 presented in the 6th Strategic Energy Plan of METI.

COST REDUCTION TARGETS

Japan, reach 5 years payback period by 2030, self-sustained market in 2020.

RELEVANT PARAMETERS

Power performance (%)	Electrical efficiency 40% by LHV
Durability (h)	90,000 h
Electrical capacity (kW)	0.7 kW
Start-up time (min)	Ca. 65 min.
Sulphur pollutant	not defined but negligible small
Total efficiency (%)	around 97% (LHV)

Based on expert input:

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