



ProEcoPolyNet

Best practice Sheet

"SOFC-CHP: GALILEO 1000 N"

RTD Project Identification

RTD Project Name

RTD Contract No.

Description of technology

Galileo 1000 N is a fuel cell system designed to replace a gas boiler in single family homes and small multi family homes. It is based on the high temperature fuel cell of SOFC (Solid Oxide Fuel Cell) type as well as on an additional gas burner. Both the fuel cell and the burner provide the basic demand of electricity and total demand of thermal energy to the building.

The Technology is not ready for the market. Market launch will be expected not to be before 2010.

Operating principle

The SOFC will be started and operated throughout the entire heating season. In summer it will be switched off due to lack of heat demand. The fc will provide the base load of electricity and heat. If the fc's thermal performance is no more sufficient, the back-up burner will provide another 20 kW to fulfil the heat demand of the building. Operation is heat oriented as usual for many CHP systems and natural gas will be used as the fuel. More information will be available on Hexis' website www.hexis.com.

Technical characteristics of installation

- ▶ Type Galileo 1000 N
- ▶ Electrical output capacity (kW) max. 1
- ▶ Thermal output capacity (kW) max. 22.5
- ▶ Thermal Input capacity (kW) 23.3
- ▶ Cooling to heat ration
- ▶ Electrical efficiency (%) 25-30 (target: >30)
- ▶ Thermal efficiency (%)
- ▶ Total efficiency (%) 90 (usually >95)

- ▶ Marginal electrical efficiency (%) ?
- ▶ Power to heat ratio
- ▶ Noise emissions (dB)
- ▶ Weight (kg) 170

Location and use

- ▶ Private Buildings yes
- ▶ Residential Buildings yes
- ▶ Commercial Buildings
- ▶ Public Buildings
- ▶ Others

Capital investment and maintenance costs

- ▶ Capital investment
- Cost of unit (€)
- Specific cost of unit (€/kWe)
- Installation cost (€)
- Total Cost (€)
- ▶ Avoided capital investment if any
- Avoided Specific cost (€/kWe)
- Avoided Installation cost (€)
- Value of avoided investment if any(€)
- ▶ Total capital investment
- Total capital investment (€)
- Total capital investment (€/kWe)
- ▶ Maintenance
- Specific maintenance costs (€/kWe)
- Total maintenance costs (€/a)

State of Development/Market implementation

- ▶ Prototype yes
- ▶ Field tested now in field test
- ▶ Serial production no
- ▶ Full market implementation no
- ▶ Etc. no

Operational data

- ▶ Average hours of operation (h/a) approximately 6'000
- ▶ Fuel input (kWe/a)
- ▶ Electricity output (kWe/a)
- ▶ Heat output (kWe/a)
- ▶ Cooling output (kWe/a)
- ▶ Electricity self-consumption (%)
- ▶ Electricity self-consumption (kWh/a)
- ▶ Electricity exported to grid (kWh/a)

CO2 and primary energy savings

Fuel (kg/kWh)

CO2 emission factor (kg/a)

CO2 emissions (kg/a)



Benefits and obstacles

- lowest emissions (NOx/CO, noise)
- high efficiency
- compact measures, weight and dimension
- easiness to install and maintain
- potential for low manufacturing costs

Contact and further information

Hexis Ltd,
Volker Nerlich,
Business Development,
P.O.Box,
CH-8404 Winterthur,
e-mail: info@hexis.com, www.hexis.com

Date of release of this Best Practice Sheet
28.09.2007