PACE

Pathway to a Competitive European Fuel Cell micro-CHP Market

REPORT

PACE Response to the UK Distribution Code public consultation DCRP/21/01/PC- G98 / G99 Minor Technical Modifications

19/03/2021

Representing the Fuel Cell micro-Cogeneration (FC micro-CHP) sector, the PACE project partners welcome public consultation to the UK Distribution Code DCRP/21/01/PC G98/G99 Minor Technical Modification. PACE asks that the capabilities of micro-CHP systems, including stationary fuel cells, are better reflected in the update to the G98 grid code, in line with accepted standards (i.e. EN 50549-1) and best practices (see below section providing detailed feedback on G98 Technical Modification Proposals).

Fuel cells are the most efficient and (temporary) low carbon means of utilising natural and bio-gas by generating high value electricity and heat locally at combined efficiencies of 90%. The deployment of fuel cells at scale would introduce new flexible distributed electricity generation capacity into the energy system thus addressing grid security risks at a lower cost. By using electrochemical process to convert the chemical energy from hydrogen rich fuels into an electricity supply and useable heat, fuel cells emit no NOx, SOx and PMs.

In the UK, stationary fuel cells will be key to cost-effectively decarbonise heat, while reducing strain on power grids as end use demand electrifies and variable renewable uptake accelerates. The UK is one of the key markets for fuel cell micro-CHP, with more than 100 units having been installed in the country between 2015 and today under the ene.field[1] and PACE projects[2]. Based on the latest modelling by Imperial College London, micro-CHP uptake can reduces the need of grid reinforcement in the UK by 1000 - 2100 £/kW_el installed in 2050 and 2030 respectively[3] (see Section below on Benefits of Fuel Cell micro-CHP).

[1] http://enefield.eu/
[2] https://pace-energy.eu/
[3] http://enefield.eu/wp-content/uploads/2017/10/WP-5.4-Impact-of-widespread-deployment-of-fuel-cell-mCHP-041017-Final_.pdf

PACE

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REPORT

PACE Feedback on G98 Technical Modification Proposals

Respondent	Alexandra Tudoroiu-Lakavice
Company Name	COGEN Europe on behalf of PACE project partners
No. of DCode Stakeholders Represented	5
Stakeholders represented	BDR Thermea (represented by Baxi in the UK), Bosch, SOLIDpower, Sunfire, Viessmann
Role of Respondent	Head of Policy, COGEN Europe (Coordinator of PACE project)
We intend to publish the consultation responses on the DCode website. Do you agree to this response being published on the DCode website? [Y/N]	Y

PACE

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REPORT

	Question	Response
Q1	Do you agree with the general intent of the proposed modification? If not, please explain your views.	Not fully. See details in the performa
Q2	If you have any detailed comments on the proposed drafting, please provide those comments in the proforma provided, or by marking up the consultation drafts of G98 and/or G99.	See details in the performa
Q3	Do you have any comments in respect of the inclusion of the references to cyber security.	See details in the performa
Q4	Do you agree that the proposed modifications satisfy the applicable Distribution Code objectives? If not, please explain your concerns.	Not fully. See details in the performa

PACE

Pathway to a Competitive European Fuel Cell micro-CHP Market

REPORT

Page / line No	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	OBSERVATIONS OF THE SECRETARIAT on each comment submitted
	9.3			For some technologies, such as µCHP up to 50 kW the droop function is due to its dynamic specification not performable by these generators. The randomized disconnection function provides a comparable droop by the population connected to the grid and contributes by this to the grid stability. To support the high efficient µCHP technology and therefore to contribute to the CO_2 reduction we ask to accept one of the proposed modifications to permit randomized disconnection	We suggest to add in 9.3.1, 1st sentence „according to EN 50549-1" after "… reducing its Active Power output" Or add the following new clause 9.3.5 Alternatively for the droop function described above, the method of randomized disconnection according to EN 50549-1 is permitted	

PACE

Pathway to a Competitive European Fuel Cell micro-CHP Market

REPORT

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	9.4.1			In Appendix 1, there is a reference to clauses of 9.4.2 and 9.4.3 but these references seems not to updated due to changes made in 9.4	The 2nd paragraph of 9.4.1 was originally 9.4.2. We assume that an unintended deletion of 9.4.2 has let to this error We suggest to make the 2nd para of 9.4.1 to 9.4.2 as it was in Amendment 4 version.	

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	9.7.1			We are fully aware about the importance to have measures to avoid cyber-attacks, if those can happen due to the connection to the public communication network. From the viewpoint of the generator according to G98, where according to 9.4.2 the input port to cease active power within 5 s does not need to have a communications interface with the risk for a cyber-attack. Furthermore, the document to which is referred to in 9.7.1 "ENA and Department for Business, Energy and Industrial Strategy (BEIS) Distributed Energy Resources (DER) – Cyber Security Connection Guidance" is not applicable for Domestic DER, see 1.2 Scope 1st paragraph.	We suggest to remove this paragraph or to make it clear that this clause is not applicable for the function as specified in 9.4.2 using a input port.	

PACE

Pathway to a Competitive European Fuel Cell micro-CHP Market

REPORT

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	8.4.4			We suggest to add the 1:1 replacement of an e.g. defect inverter by a spare part inverter with the same functionality as the old one, because the generator was certified to that as a hole. For this type of replacement no additional certification should be necessary.	Please add a text, so that a 1:1 replacement by a spare part with the same function a new certificate according to G 98 A6 is not required.	

PACE

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REPORT

Benefits of Fuel Cell micro-Cogeneration

Fuel Cell micro-Cogeneration significantly contribute towards EU's energy and climate objectives.

Fuel cell micro-cogeneration:

- **Empowers consumers**

Fuel cell micro-Cogeneration transforms Europeans into active energy 'prosumers' (producer-consumers), creating a decentralised energy system with a reduced carbon footprint and lower energy bills. The most highly efficient fuel cell micro-CHP technologies can be operated according to electricity demand when installed in new low-energy buildings-but are also suitable for existing buildings.

- **Supports the decarbonisation of buildings**

With total efficiencies of more than 90%, including electrical efficiencies of up to 60% (for SOFC fuel cells) and up to 38% (for PEM fuel cells), this technology can achieve significant energy savings and CO2 emission reductions. This "fuel flexible" technology will be progressively fuelled by renewable energy sources, such as hydrogen and renewable gas.

- **Provides greater flexibility for the grid**

By generating heat and electricity near the point of consumption, Fuel Cell micro-Cogeneration relieves the stress on the electricity grid during peak demand (e.g. for powering heat pumps and charging electric vehicles). It can step in when the wind is not blowing and the sun is not shining.

- **Fosters innovation and high value jobs**

Provides new and highly skilled green jobs in Europe, while building on the existing expertise of the heating industry.

Because fuel cell micro-cogeneration attains high efficiencies, it reduces primary energy and results in greenhouse gas (GHG) emission reductions. In addition, the mode of operation of the micro-Cogeneration unit can support the grid integration of variable renewables.

As part of the ene.field EU flagship project, the large scale uptake of micro-CHP has been further analysed in terms of macro-economic and -environmental benefits up to 2050. Comparing two scenarios with or without micro-CHP, installing 1 kW of micro-CHP helps avoid more than 2,000 EUR in the electricity grids (equivalent to **more than EUR 30 bn in avoided grid investments in 2030, assuming the full economic potential is realised**). Decarbonisation benefits range between 500 kg & 3.5 tons CO2/kW per year between now and 2050, assuming no uptake of renewable gas (which would bring further decarbonisation benefits).

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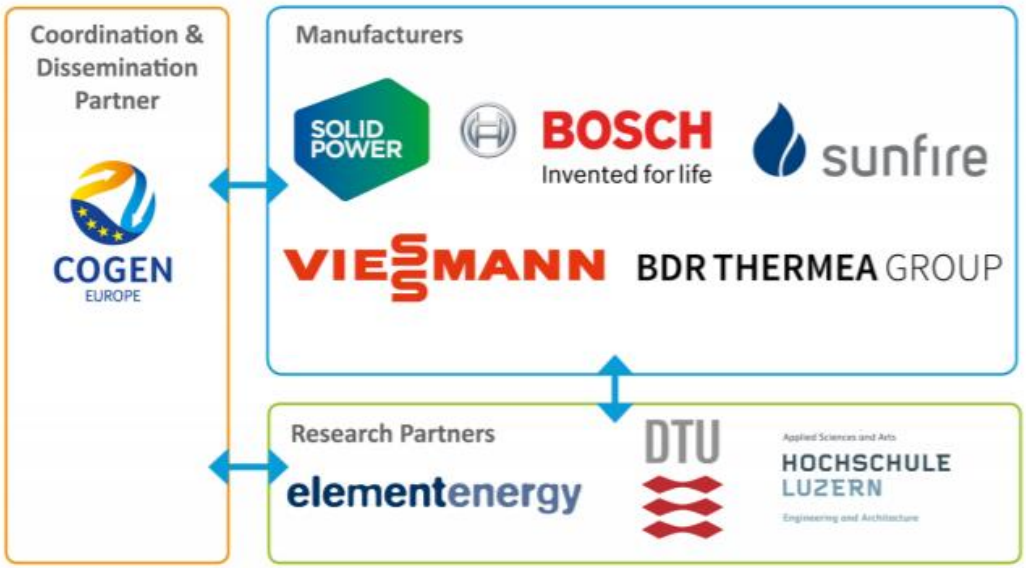
REPORT

About PACE

PACE is a major EU project unlocking the large-scale European deployment of the state of the art smart energy solution for private homes, Fuel Cell micro-Cogeneration. PACE will see 2,800 householders across Europe reaping the benefits of this home energy system. The project will enable manufacturers to move towards product industrialisation and will foster market development at the national level by working together with building professionals and the wider energy community. The project uses modern fuel cell technology to produce efficient heat and electricity at home, empowering consumers in their energy choices.
PACE project, which stands for "Pathway to a Competitive European Fuel Cell micro-Cogeneration market", is co-funded by the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) and brings together European manufacturers, research institutes and other key energy stakeholders making the products available across 11 European countries.

For more information, visit *www.pace-energy.eu*
or contact Ms Alexandra Tudoroiu by email *alexandra.tudoroiu@cogeneurope.eu*

The PACE partners are



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