

From: Miriam Gahleitner <miriam.gahleitner@pelletsheizung.at>  
Sent: 17 noiembrie 2016 12:44  
To: coduri\_acces\_retea@anre.ro  
Subject: ÖkoFEN | Application for emerging technology classification  
Attachments: Okofen Emerging technology application\_Romania.pdf; Microgen 1 kW Engine flyer.pdf; Microgen 2kW Engine Flyer.pdf; okofen-e-folder-2014\_EN.pdf; Prüfbericht\_ÖkoFEN\_Pellematic\_Smart\_e\_ST16.pdf; Bitdefender.txt

Importance: High

Dear Sir or Madam,

Please find attached the completed application for the classification as emerging technology for Romania. Furthermore you will find some more information about the ÖkoFEN Micro-CHP system called "Pellematic Smart\_e" which incorporates a Microgen Free-Piston-Stirling engine in the documents in the annex.

We kindly ask you for a positive evaluation of the application! Please inform us if you need further information or documents for the assessment of the application.

If you have any questions, please feel free to contact me!

Yours faithfully, Miriam Gahleitner

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# ÖkoFEN | RFG Emerging Technology Application

## Appendix 1 - 'Emerging Technology' application template

### Teil A - Contact detail Teil A - Kontakt

Manufacturer name:

ÖkoFEN Forschungs- und  
EntwicklungsgesmbH

Manufacturer address:

ÖkoFEN Forschungs- und EntwicklungsgesmbH  
Gewerbepark 1  
4133 Niederkappel  
AUSTRIA

Date of application:

16 / 11 / 2016

Primary contact number:

+43 (0) 7286 7450 0

Email address:

miriam.gahleitner@pelletsheizung.at

### Teil B - Description of PGM technology Teil B - Beschreibung der Technologie der Stromerzeugungsanlagen

Power generating module(PGM) technology name:

Pellematic Smart\_e - Pellet boiler with integrated Microgen linear free piston Stirling engine

Description of PGM technology:

The Pellematic Smart\_e is a micro-CHP device using wood pellet as fuel. A Linear Free Piston Stirling Engine Generator from Microgen Engine Corporation (MEC) is integrated into a pellet boiler for electrical power generation. The technology used for power generation (Stirling engine, control technology of the Stirling engine etc.) is produced and afterwards sold to ÖkoFEN, who integrate the technology into a pellet boiler.

Current products that use the PGM technology: Produkte, die derzeit diese Technologie nutzen:

ÖkoFEN Pellematic Smart\_e ST16

Beside the Pellematic Smart\_e there are currently pellet boilers under development which also should incorporate the Microgen Stirling engine (electrical performance classes: 1 kWe and 2 kWe). The generation of electricity with a MEC Stirling engine will also in in future be a very important part of the ÖkoFEN's pellet cogeneration division.

### Teil C - Evidence that PGM technology meets criteria Teil C - Nachweise zur Erfüllung der Kriterien nach Art. 69 R/E No

Is the PGM of type A in size (800W to 1MW)? Please provide detail (e.g. maximum capacity):

Max electrical output 1kW to 2kW (see technical datasheets from Microgen)

Is the PGM commercially available? Please provide evidence to support this:

The following documents are enclosed as evidence with this application:

- Folder of Pellematic Smart\_e
- Type test report of Pellematic Smart\_e ST16 (German)

- Data sheets from Microgen

Further information about the Pellematic Smart e can be found under the following links:  
[http://www.okofen-e.com/en/pellematic\\_smart\\_e/](http://www.okofen-e.com/en/pellematic_smart_e/)  
[http://www.pelletsheizung.at/de/pellematic\\_smart\\_e/](http://www.pelletsheizung.at/de/pellematic_smart_e/) (German)

*Please state the total accumulated sales (in kW value) in Romania and the synchronous area "Continental Europe" in kW:*

OkoFEN has installed 0 kW in Romania (by now).

Overall OkoFEN has installed 35 kW (0.035 MW) in customer installations in the synchronous area "Continental Europe".

#### **Part D - Explanation of application**

*Please explain why you are applying for your PGM to be classified as an emerging technology:*

The application for Emerging Technology classification is based on the following technical and commercial reasons:

##### *a) Technical*

The Network Code requires Type A PGM, which include micro-CHP units, to be capable of operating within a frequency range from 47 Hz to 52 Hz. The directly coupled synchronous Linear Free Piston Stirling Engine, is a technology based on tuned spring mass systems and designed for operation at a fundamental frequency of 50 Hz. To reach the necessary high efficiency and reliable operation, a restricted operating frequency range from 49.5 Hz to 50.5 Hz, is required, which does not comply with the requirements of the NC RfG, Article 13.

The contribution to the active power reduction above 50,2 Hz is achieved by performing randomized disconnection within its range of frequency operation based on the MEC Stirling quantities sold. Due to the randomized disconnection capability, a very fast reaction to Limited Frequency System Mode response for Over-frequency (LFSM-O) is possible, which contributes additionally to grid stability.

##### *b) Commercial*

Micro-CHP is a domestic appliance or household product; its manufacturing and marketing approach are fundamentally similar to the boiler market. Compliance with the NC RfG would add 10-20% to the product cost, with a development time of 6 years or more. Development cost estimates for a new Stirling engine range between € 9 - € 11 million. Achieving Emerging Technology classification will allow us the time to grow volume and revenue to deliver the investment required to ensure this technology meets the Network Code in future years.

#### **Part E - Consideration of the wider impacts**

*Please provide information on the wider impacts of classifying your PGM as an emerging technology. For example, what is the impact on competition, security of supply and sustainable development?*

Other technologies in this market utilise inverter technology and have the ability to meet the requirement of the Network Code with software setting changes as opposed to a fundamental design change that would be required for Stirling Engine technology. Without emerging technology classification Stirling Engine CHP would be at a disadvantage with the competition.

These low electrical output domestic CHP products are not concentrated in only one geographical area but spread out across the whole of Europe. With the limited capacity of 0.1 % they do not present any threat to grid security.

The reaction on LFSM-O with randomized disconnection will progressively turn off domestic CHP units and contribute to grid stability due to its fast reaction time.

Domestic CHP appliances mainly operate during peak household power demand periods (in the winter where at least PV does not produce very much of active power), thereby enhancing grid stability and security.

Importantly, micro-CHP installations contribute to Green House Gas emission reductions and energy efficiency improvements in the built environment. Biomass, waste heat and solar units offer wider and additional CO2 reduction benefits.

**Bitte füllen Sie zusätzliche Informationen aus. / Please provide any other information relevant to your application not included above:**

Place, Date) 16/11/16

**ÖKOPIER**  
Forschungs- und Entwicklungsges.m.b.H.  
Gewerbepark  
A-4133 Niederkapfen  
(Corporate Signature)