



Presentation to the ENTSO-E USER Group meeting on Jan, 16th 2013 in Brussels

Network Code – Requirements for Generators

Needs for Modifications Regarding the Impact on mCHP Appliances and their Contribution to the 20/20/20 Goal

The content of this presentation was jointly drafted between



and



and is therefore fully supported by COGEN Europe

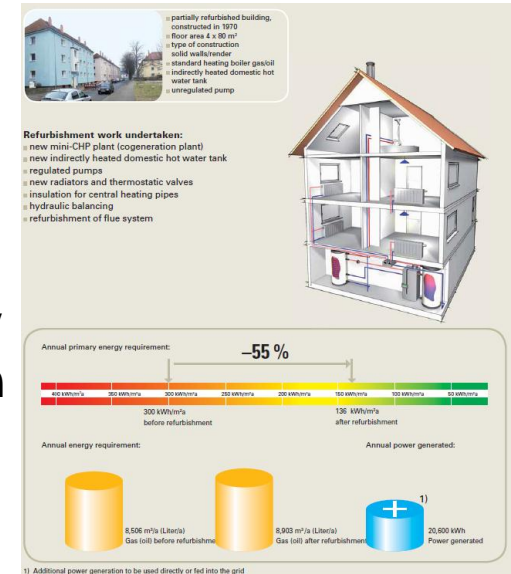
- **European Heating Industry has**
 - **turnover : 20 billion €**
 - **120.000 Employees**
- **EHI represents:**
 - **35 companies, including the leading ones**

 excellence in hot water								
								
								
								

- **13 national industrial associations from the EU Member States, Liechtenstein and Switzerland**

- For 15 years high investments into mCHP technology development,
- EU energy target 20/20/20 and CO2 reduction is the main driving factor
 - Internal combustion engines were introduced in the mid 1990s as the first mCHP technology
 - Stirling engines started ramp-up production in 2010
 - Fuel cells are predominantly still in field trial. Government funded project from e.g. DE, EU are covering in total < 2.000 appliances
- Market forecast in 2020:
 - sales volume grows up to 50.000 units
 - Cumulated quantity 185.000 units
 - Cumulated capacity 250 MW (all technology)
- mCHP technology is in development or early launching phase



- **NC RfG and its impact to the mCHP technologies**
 - **Stirling Engine (Synchronous linear free piston type)**
 - **Fundamental mechanical design principle as resonant mass-spring system**
 - **Operation outside 49.5 – 50.5 Hz range will cause damage, comparable to resonant mode phenomena of steam turbines**
 - **Reduction of active power output during over-frequency by randomized disconnection emulating a 0.6% droop is possible**
 - **long reaction times for regular shut down and active power modulation due to heat transfer through cylinder wall**
 - **Remark: The required frequency range of operation at the time when the Stirling engine was developed was 49,8 Hz – 50,2 Hz.**
 - **ICE and FC**
 - **Operation within the frequency range 47 – 52 Hz is given**
 - **Active power reduction between 50.2 - 51.5 is possible by randomized disconnection**
 - **time constants for active power modulation are quite long in fuel cells (thermal restraints in SOFC stacks and PEFC reformers) an the two other technologies.**

- **When and for whom “significant” test**
 - **For technologies which do fundamentally not comply with exhaustive requirements as long as their installed capacity is considered as non-significant,**
 - **For technologies which are still in development or in its early launching or start-up phase when the NC becomes effective,**
 - **Where launching of the products is important to get financial return for developing the next generation complying with the NC**
- **When and for whom “derogation”**
 - **For technologies where the technology can comply with the NC in principle but where current versions don’t.**
 - **Where the industry needs a certain time for developing the next generation**

- **Proposal**
 - **Significant Test**
 - **Non-SGU: Installed capacity not complying with the NC providing the same behaviour if $\leq 0,1$ % of the peak load capacity within a synchronous zone.**
 - **For the Continental European Zone the level should be 300 MW.**
 - **The immediate loss of this capacity as a result of a major loss leading to frequencies of $< 49,5$ Hz would lead to another reduction of $< 0,1$ Hz, which is not significant.**
 - **This definition should be given in the NC or in an other legal binding document**
 - **How to ensure that the installed capacity does not exceed this level:**
 - **The manufacturer will provide to ACER the sold capacity per synchronous zone on a $\frac{1}{2}$ years basis**
 - **TSO / DSO will send their registered capacity to ACER**
 - **ACER will inform via the web-side in a neutral form the installed capacity for those technologies**
 - **The synchronous linear free piston Stirling Engine is a technology for which the “Significant Grid User” test shall apply.**

- **Proposal (continue)**
 - **Derogation:**

The derogation process as proposed by ENTSO-E in their document from 17.12.2012 needs to be amended

 - **Manufacturer shall have the right to apply for derogation**
 - **mCHP appliances are a mass market products,**
 - **manufacturer confirms conformity to standards and regulation**
 - **manufacturer (investor) can only sell a product to the end user if it fits to the requirements including considering the agreed derogation,**
 - **An end user or thousands of them would never ask for derogation on their own, therefore the manufacturer need to have the right to apply for derogation,**
 - **A derogation is part of the “technical specification” of the product and therefore clarity needs to be available before the end user has any product information.**
 - **No investor would invest if sales are not ensured.**

- **Proposal (continue)**
 - **Derogation (continue):**
 - **Pan European derogation process should be possible**
 - **The mCHP market is a European market where industry needs to have common requirements or at least stable known once to keep the product costs and therefore the energy costs as deep as possible.**
 - **Derogation procedures which depends on TSO / DSO increase complexity and the risks for investors without having influence to the cross boarder aspect.**
 - **ACER should be the neutral body for such derogation requests. The results should be published at the web-side**
 - **For the μ CHP appliances based on FC and ICE technologies derogation is requested for 5 years after the NC is in force.**

- **Proposal** (continue)
 - **“Avoiding” derogation on non-exhaustive requirements of NC**
 - For type A generator several non-exhaustive requirements are given in the NC RfG,
 - The mCHP industry needs to have pan European wide clear and stable requirements including test methods for the their validation,
 - The NC RfG, should be amended to include the procedure for providing a Mandate to the European Standardization body e.g. CENELEC for developing a European Standard complying with the NC, e.g. EN 50438, EN 50549, ...
 - If an independent Consultant (on behalf of ACER) confirms that the Standard complies with the NC then this standard
 - shall be listed in the OJEC to show that it is a harmonized
 - shall provide “presumption of conformity” with the NC
 - to define the conformity assessment procedure e.g. “through a notified body and a third party test”
 - This procedure is successfully used in conjunction with other EU Directives such as LVD, GAD, PED, ...
 - Due to the transparent process of European standardization this procedure will have advantages for all parties: end user, TSO, DSO and industry.

**We ask ACER and ENTSO-E to agree to this proposal
to support the mCHP market and
their contribution to the CO₂ reduction
leading to a less global warming which
all of us and the future generation will need.**

Thank you for your attention