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NC RFG User Group Meeting 16 January 2013

Changing the way
Europe provides heat and electricity
For a sustainable future

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COGEN Europe represents the full supply chain of the cogeneration sector with 70 members across the sector:

- 13 Pan-European companies:

- 15 National COGEN Associations:

- 42 Associate Members covering micro-CHP manufacturers to heavy industry and project installation to finance

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This presentation addresses the overall response from COGEN Europe members to the ACER opinion on the NC RfG proposal of June 2012.

COGEN Europe and EHI have produced a joint statement regarding type A generators which is summarised in some detail by the EHI presentation for today's NC RfG User Group meeting, 16th January, and which COGEN Europe and EHI jointly support. The detail is not reproduced here.

ACER Opinion NC RfG: Significance test

ACER proposes "*development of a credible methodology to take account of the identified user significance issues" and* highlights that at the proposed NC RfG *"risks stifling innovation"*

Risks:

Market entrants and products in development risk a high additional cost burden and additional financial risk if no clarity exists around how NC changes will affect them at time of market entry.

Investor confidence is undermined by unpredictable changes in product requirements, which will be taken by investors as a financial risk.

A derogation process must be workable by users falling in all generator types.

The NC should allow all distributed generators at DSO level to modify their equipment in a timely fashion to encourage new technologies.

Significance test

- The significance test should be constructed to maintain the safe and reliable operation of the grid while encouraging innovation among type A and distributed generators.
- A significance test based on penetration and cost benefit analysis will allow Type A modules that cannot easily meet proposed code changes due to major design constraint incurring penalising costs and unrealistic design time pressures at a time of market entry.
- The significance test should be constructed in such a way that emerging and newly launched technologies that cannot meet a proposed NC change but conform to the previous regulations are given time to establish a certain market penetration, and hence investor confidence. This allows assessment to prove the technology and give reasonable justification for the next investment stage.

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COGEN Europe Proposals to complete the NC RFG

All of the following are required to encourage innovation :

1) A Significance test defining a significant generator and allowing products at market entry and late development level a well defined, volume based, risk free entry.

2) An amended derogation procedure allowing 3rd parties, including manufacturers, to apply for derogation and providing for a Europe-wide approach to make the NC realistic for distributed and micro generators and not to stifle innovation.

3) The European Commission should issue a mandate to develop the necessary harmonized standards for type A generating products which must comply with the network codes and specify more detailed requirements.

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Significance test proposal

Methodology for significance should be based on

a) An accumulated level of penetration of a technology group in a synchronised area whose simultaneous loss would result in a **loss of generation ≤ 0.1%** of maximum system load. (Assuming a self-regulation effect of 1%/Hz as noted in UCTE's Policy 1, a loss of generation of 0.1% will result in an additional drop in frequency of an extra 1/10 Hertz.)

b) The penetration level should apply to the accumulated capacity of type A modules in specific technology groups.

→ The impact estimate is conservative and could possibly be higher than proposed.

Derogation process amendments

ENTSO-E includes in its Briefing Note (17th Dec 2012) that the NC should allow technologies to be treated individually and also that the NC requires a process for pan-European derogation led by ACER. COGEN Europe supports these two points.

COGEN Europe also believes that these amendments alone will not be sufficient because as they exclude the opportunity for a manufacturer to apply for a derogation and alone the uncertainty of a derogation process at the end of a long development phase does not address the need of new market entrants.

- Restricting the original applicant to the grid user is not practical: The user of the network in the case of the very small Type A module is an individual home owner.
- A derogation process is not appropriate for very low penetration new technologies as it adds unnecessary additional risk and red-tape costs for innovation and puts a negative pressure on innovation

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Derogation process amendments

COGEN Europe proposes the following amendments to the derogation process.

- Manufacturers should be specifically cited as able to make such requests for a class of generating modules.
- ACER should open a consultation process to check the non-discriminatory nature of any derogation **and** to decide on the request on extending a nationally granted derogation Europe-wide.
- There should be an effective process to establish a pan-European derogation.
- The time periods for such derogations should be proportionate to the type of change required and a minimum of 5 years for redesign of hardware should be considered.
- Non-exhaustive requirements of the network code (where technical requirements are incomplete) can be the subject of derogation.
- European Commission should issue a mandate to develop the necessary harmonized standards for type A generating products which must comply with the network codes and specify more detailed requirements

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Use of standards to achieve NC objectives

The European Commission should issue a mandate to develop the necessary harmonized standards for type A generating products which must comply with the network codes and specifies more detailed requirements.

- Standards are widely referred to throughout European Legislation to establish compliance with requirements.
- Standards are the best adapted approach for products in the very low capacity range and for household appliances.
- Standardisation and related certification removes the cost of compliance testing from the network operator and the early involvement of manufacturers allows the finding of cost effective solutions for grid operators.

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Justification of the significant deviations from existing standards and practices

Fault-Ride-Through:

COGEN Europe acknowledges that it is desirable to review the level of Fault-Ride-Through requirements for type B generators in the NC RfG. However, COGEN Europe does not believe that the significant proposed changes being requested in the NC have been justified by demonstrated additional benefits.

COGEN Europe recommends that ENTSO-E assesses (as part of structured and transparent CBA) the adequacy and feasibility of modifying the FRT requirements for type B generators in view of additional / alternative solutions, and whether the overall scope of the change is desirable at the European level. COGEN Europe members will support with adequate information in response to clear CBA guide-lines.

COGEN Europe believe that specifically for cogenerators a default value of 150 ms for three phase faults is adequate when coupled with good network design.

➡ **Any extension to 250ms should be justified for type B by a CBA!**

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Fault ride through

Background :

- Light gas turbines (e.g. aeroderivatives) and CHP engines in the MW-range (type B) have a large ratio of power to drivetrain inertia.
- The current baseline in grid operation practice for maximum clearance is 150ms is used (the Italian CEI 0-16:2012 clause 8.8.6.1, the German E VDE-AR-N 4120:2012 clause 10.2.3.2, or the British Grid Code I5R1:2012 clause CC.6.3.15.)
- Requirement in the Nordic area is 250 ms maximum clearance at eHV.

Requested change in NC: Justification needed for moving the max clearance time to 250 ms for type B generators.

Implications: Manufacturers of cogeneration equipment of type B must add considerable mass and cost (flywheel or a oversized alternator) to the generator set with the single purpose of meeting this change.

Alternative NC approach:

Use modern grid protection techniques (including breaker technology and software if appropriate) to provide protection

OR

Any TSO with other regional needs shall ask for derogation according to NC Article 53(5).

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Justification of the significant deviations from existing standards and practices

Exemption for Combined Heat and Power units on industrial sites (Article 3(6) (h))

Many industrial processes do not use steam from their CHP plants using instead hot water or direct heat. Several industries prefer not to use steam as it requires trained operators and is more difficult to control where the temperature required is sensitive. (**COGEN Europe Briefing Note: The use of heat and steam in cogeneration processes in industry:** *30/11/2012*)

Sectors benefit from Direct Drying: Food (Crop drying, animal feedstock), Ceramic (brick, china, tiles), Distilling, Cement

Indirect Drying: Sludge, Food, Thermal Oil

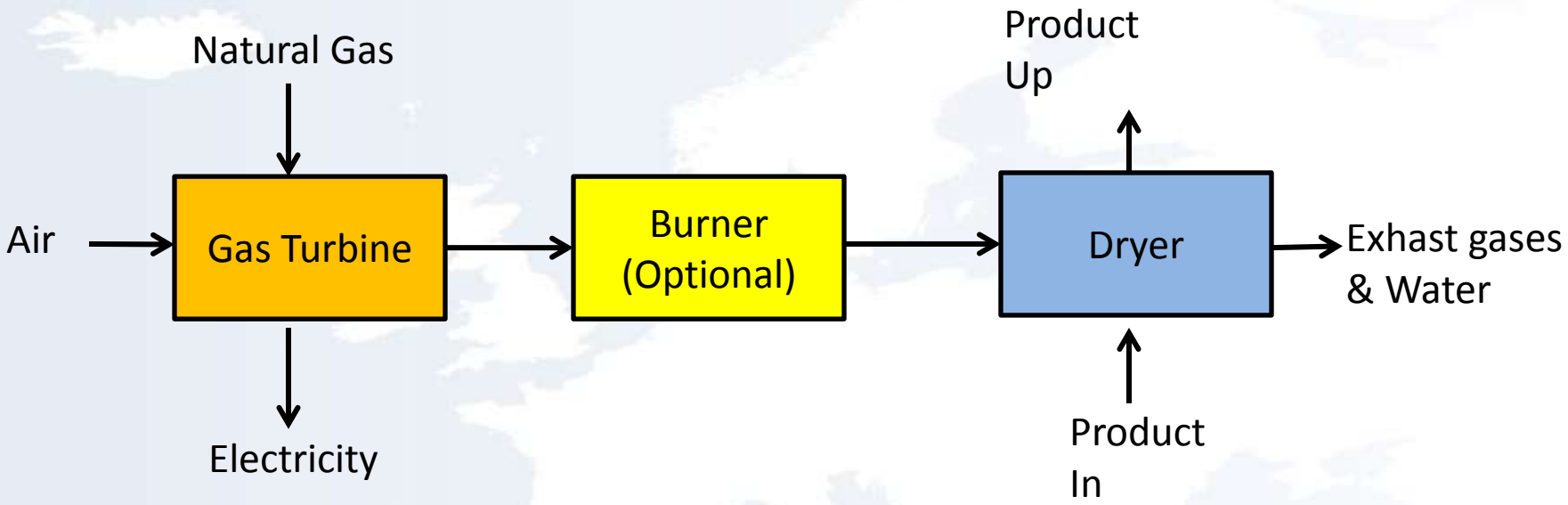
High temperature hot water: Dairy, Brewing

These are all tightly coupled industrial processes.

COGEN Europe proposes that

The term “heat” is the generic term covering the delivery of thermal energy in a tightly coupled industrial process. COGEN Europe propose that “steam” be replaced by the term “heat” throughout Article 3(6)(h)

Direct Drying



Typical Fuel Efficiency: 80-90%

Source: Siemens, August 2006. Siemens Industrial Turbomachinery

3xSGT-200 CHP for a Ceramics Plant
Direct Use of Exhaust Heat

SIEMENS

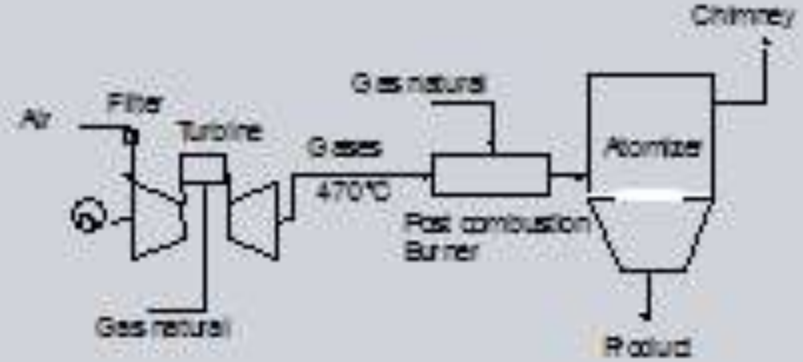
Ceramics plant in Spain, producing atomized red clay, stone paving and porcelain paste

Demand: Continuous supply of site power and heat for the drying towers

Solution:

- 3xSGT-200 gas turbines exhausting into drying towersto dry the liquid clay
- Electric output: 3x5,850 kW
- Total efficiency:81%
- Surplus electricity sold to the grid

Savings: 19,600 t.o.e. per year



Proposed changes : Article 3 (6) (h) NC RfG

Exemption for CHP employed in industrial processes

Draft NC RfG	COGEN Europe Proposal
Article 3 (6) (h)	
Without prejudice to the general applicability of the requirements set forth in this Network Code, a requirement of this Network Code shall not apply to Power Generating Modules of facilities for combined heat and power production (CHP) embedded in the Networks of industrial sites in the following cumulative circumstances: - the primary purpose of these facilities is to produce heat for production processes of this industrial site; - the generation of heat and power are rigidly coupled to each other, i. e. any change of heat generation results inadvertently in a change of Active Power generation and vice versa; - the Power Generating Modules are of Type A, B or C according to Article 3(6) (a) to (c); and - the requirement is related to the capability maintain constant Active Power output or to modulate Active Power output other than Article 8(1) (c) and (e).	Without prejudice to the general applicability of the requirements set forth in this Network Code, a requirement of this Network Code shall not apply to Power Generating Modules of facilities for combined heat and power production (CHP) embedded in the Networks of industrial sites in the following cumulative circumstances: - the primary purpose of these facilities is to produce ~~***steam***~~ ***heat*** for production processes of this industrial site; - the generation of ~~***steam***~~ ***heat*** and power are rigidly coupled to each other, i. e. any change of ~~***steam***~~ ***heat*** generation results inadvertently in a change of Active Power generation and vice versa; - the Power Generating Modules are of Type A, B or C according to Article 3(6) (a) to (c); and - the requirement is related to the capability maintain constant Active Power output or to modulate Active Power output other than Article 8(1) (c) and (e).
Justification Steam is only one of the different forms of heat carriers employed in industrial processes which use CHP.	

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