



# **Grid Connection Charging for Decentralised Power Generation**

17 November 2005

## INTRODUCTION

Cogeneration is the most efficient way of producing electricity and heat. The wider use of this fuel-saving technique will not only help reducing the dependency on energy resources outside the European Union and reaching the Kyoto targets, but also represents a more cost-efficient option to the current energy structure, which is largely characterised by centralised power supply. As various studies have pointed out<sup>1</sup>, a transformation to a more decentralised energy system, including a growing share of cogeneration, is the cheaper option as network infrastructure investments are avoided. Cogeneration currently represents 13% of electricity production and 15% of heat production in the EU-25.

By transposing the Cogeneration Directive (2004/8/EC) in February 2006, Member States will implement policies that aim at increasing the share of high efficiency cogeneration. As Energy Commissioner Andris Piebalgs has recently confirmed, there is an informal 18% target to be achieved by 2010 in the EU-25. Even if this target will probably not be reached on time, the European Union should still aim at achieving this target as soon as possible. For doing so, it is necessary to put a political framework in place that ensures reliable support mechanisms for cogeneration, eases the administrative burden and provides for fair and transparent access to the electricity networks.

In many cases, access to grid networks is not a trivial problem for decentralised electricity generators. In the absence of clear and transparent rules, the project developers have no other choice than “negotiating” the access conditions with the local grid operator who has got the monopoly on the electricity networks. The European Institutions recognised the need to overcome such grid barriers by referring in the Cogeneration Directive to the respective art. 7 of the Renewables Directive (2001/77/EC). Thus, the progress made and the experience gained with overcoming grid barriers for renewable energy sources has a direct impact on combined heat and power production.

Therefore, this policy statement is also intended to feed into the discussions on administrative barriers and grid issues pursuant to art. 8 of the Renewables Directive, which requires the European Commission to publish a report on these matters by the end of 2005. It should be noted, that while this policy statement focuses on grid connection charges, other issues such as over-lengthy administrative procedures constitute an equally important obstacle for decentralised power generation. COGEN Europe will publish recommendations on administrative procedures in due course.

## KEY POINTS

1. COGEN Europe believes that **more consistency and transparency is needed** in the approach to generator connection charging across Member States in order to create a non-discriminatory environment for distributed generation. Therefore, we urge that fully transparent interconnection procedures, connection charging mechanisms and connection costs be introduced (and enforced) across Member States.

2. In general, connection **charging for distributed generation should follow a**

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<sup>1</sup> IEA (2003), World Energy Investment Outlook.  
WADE (2005), World Survey of Decentralised Energy.  
Mott MacDonald (2004), System Integration of Additional Micro-generation.

**SHALLOW charging philosophy.** This means that generators pay only for the equipment needed to make the physical connection of their generation plant to the grid network, and that all other costs (including in particular any potential network reinforcement upstream of the connection point and any other cost not strictly necessary for the grid connection itself) are the responsibility of the Distribution Network Operator (DNO).

However, there is an issue with the shallow connection charging approach that must be considered: The need to develop fair and transparent mechanisms for the recovery of those costs incurred by DNOs relating to the reinforcement of the grid network following the connection of distributed generation (the so-called “deep” cost elements).

3. In relation to the item above, where grid network reinforcement is necessary following the connection of a new distributed generation plant and **in cases where pure shallow connection charging is not considered acceptable**, COGEN Europe proposes that:

(i) The distributed generator is required to make a (percentage) financial contribution towards reinforcement costs. Using this approach the developer of the distributed generation plant is charged only that proportion of network reinforcement costs representing his proportional use of the network after reinforcement has been completed. Charges of this type are intended to provide locational signals to generators (for efficient siting of generation plant) and give recognition to the fact that others may gain benefit from the installed reinforcement assets.

It is of course critical in these cases that the percentage contributions to reinforcement costs paid by the developer of distributed generation plants are fair, transparent and non-discriminatory. Therefore, COGEN Europe proposes that **this proportional contribution is derived from the power capacity of the new generator relative to the capacity of the local grid network following reinforcement.**<sup>2</sup> Such a system has been successfully introduced in the United Kingdom. It provides a good representation of the generator's proportional use of the reinforced grid infrastructure at the connection point. The reinforcement costs liability of the generator shall also be limited to those costs incurred at the voltage level at which the generator is connected, thus ensuring that the distributed generation plant developer is only charged in proportion to the costs of network reinforcement that directly and clearly arise from the need to provide its connection.

(ii) The proportion of the reinforcement costs not paid for by the generator is the responsibility of the DNOs. The DNOs are then allowed to recover these costs from customers through normal tariff mechanisms. These tariffs are subject to regulatory approval. This approach allows the DNO to choose for deeper network reinforcement at its own costs, whenever that is beneficial from its viewpoint.

(iii) In deriving the costs of reinforcement, the DNOs should base their

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<sup>2</sup> For example, to accommodate a 5 MVA generator, a DNO chooses to reinforce the local distribution network at the connection voltage from 3 MVA up to 10 MVA. In this case the generator's contribution to reinforcement costs would be  $5 / 10 = 50\%$  of the cost of works at the connection voltage only. In the system proposed here, the generator does not pay for any reinforcements at voltages above the connection voltage.

calculation method on the reinforcement works being the “least cost technically acceptable solution”. The calculation methods used by the DNO, along with costs of interconnection equipment (e.g. overhead lines, switchgear, cables) used in the derivation of costs, should be published by the DNO and approved by the appropriate regulatory authority on an annual basis. To further increase transparency and competition, connecting generators should have the right to obtain Third Party quotations for the connection and reinforcement works in compliance with the DNO’s technical specification.

(iv) **For small generators (systems below 1 MW) it is recognised that very simple connection charges and rules are required.** These projects are normally not capital-intensive so that high connection charges can heavily influence the overall cost-benefit balance. Therefore, it is recommended that pure shallow charging shall apply for these systems, with no contributions being required from small generators towards local distribution network reinforcement. Any reinforcement costs in these instances should be the responsibility of the DNO. In order to facilitate this, it is recommended that individual generators of this type be required to provide notification to the DNO of their intention to connect to the DNO’s network. In cases where a developer wishes to connect multiple generation units of this type to the same section of DNO network, the DNO must be notified prior to connection and within a time period commensurate with the implementation of reinforcement works should they be necessary.

(v) **Distributed generation plants that are developed for domestic use only** (e.g. micro-cogeneration) should enjoy an even more simplified grid access. As this market segment essentially represents a boiler-replacement market, it is **essential that there are no delays due to grid connection procedures.** It can not be demanded from domestic users to live for weeks in a non-heated building because of administrative procedures with the DNO. Therefore, COGEN Europe advocates the so-called “inform and fit” approach which gives the right to the domestic user of distributed generation plants to connect to the network directly after having informed the DNO. Thus, advanced permission from the DNO should not be required.

(vi) In the case where a generator is connected to the distribution network in a region that has already been reinforced following the connection of a previous distributed generation scheme, the same apportionment methods described above shall apply for the new generator, i.e. the new generator shall only pay, proportionally, for any new reinforcements needed on behalf of the new generator.

4. A key issue relating to connection charging is the **need for defined (and enforced) timescales** relating to the DNOs’ preparation of connection quotations. Therefore, it is recommended that DNOs are required to submit binding connection quotations to distributed generation plant developers, including cost apportionment proposals for reinforcement works, within 40 days of application (with the exception of domestic generation).

5. COGEN Europe also proposes that **prospective distributed generation plant developers be given the right to access the network technical parameters of DNOs’ systems** in order to facilitate the optimal placement of new generation plant

within distribution networks.

6. COGEN Europe urges that annual connection charges levied by DNOs are solely used as a means of recovering the costs of maintaining the DNO's assets involved in the connection of the generator, and are not used by DNOs to recover other "deep" costs associated with the initial connection of the generator. These annual connection charges shall be published and subject to regulator approval.

7. It is important that there are **clear arbitration methods** in place, with clearly-defined and enforced response times to oversee cases of disputes relating to connection charging practices. It is, therefore, recommended that regulatory bodies within Member States are given the responsibility for arbitration, in conjunction with the power to impose changes to connection charging costs and practices where necessary.

## MORE INFORMATION

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*These policy recommendations represent a direct output of the EIE-funded research project „European Local Electricity Production (ELEP)“. ELEP aims at defining detailed policy recommendations for removing barriers to decentralised generation within the framework of the liberalised EU energy markets, and represents one of several projects in this field, which enjoys the support of the European Commission. Project partners are Rolls-Royce, CESI, City of Frankfurt/Germany, COGEN Europe, Ecogen, EnerInn, Essent, Turbec and Wärtsilä. For more information, please visit the ELEP website (<http://www.elep.net>).*