

THE DRAFT EUROPEAN CHP DIRECTIVE welcome but needs strengthening

Cogeneration and On-Site Power Production

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Finally published in July this year, the proposal for an EU Directive on cogeneration disappointed many commentators for its lack of ambition. Here, [PETER LÖFFLER](#) takes a critical look at the draft and suggests how it might be improved.

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Almost five years after the European Commission published the Community's CHP Strategy,¹ the long-awaited proposal for a European Directive² on CHP came out in July 2002.

Recent years have been difficult for cogenerators, who have struggled with unfavourable economic and regulatory conditions in the wake of the bumpy transition to liberalized energy markets. At the same time, little progress has been reported in tearing down the barriers and obstacles to CHP identified and recommended for removal in the 1997 Strategy. As a result, the recent development of CHP in Europe has been slow and, perhaps, even negative. Preliminary information from the European Environment Agency raises concerns that the EU-wide share of electricity production from cogeneration has declined since 1998.³ This development is clearly a setback for the three major objectives of the European Community's energy policy; namely fair competition in a functioning liberalized market, environmental and climate protection, and security of energy supply.

CHP is an excellent way of achieving all three of these objectives. Unsurprisingly, they all provide the grounds on which the Commission has proposed the CHP Directive. The Commission announced its intention to present in 2002 a proposal for a CHP Directive in a Communication related to the European Climate Change Programme in October 2001,⁴ making climate protection a key justification for the need for a CHP Directive. Indeed, the *future cogen study*⁵ estimated in 1999 that the EU could double its share of electricity from CHP by 2010, and that CHP could potentially supply 22% of generated electricity. This could translate into savings of 127 million tonnes of carbon dioxide by 2010 and 258 million tonnes by 2020 - a significant contribution to European climate protection targets.

At the same time it is also fully acknowledged that electricity from CHP, which in some EU countries accounts for over a quarter of national electricity generation, enhances competition in the electricity market and helps Europe to reduce both its fuel bills and its dependency on fossil fuel imports.



Cogeneration in Europe - part of a new, 10.6 MW cogen plant from Turbomach serving a food production company in Spain

A GOOD FRAMEWORK

The initiative to produce a European Directive for CHP is very welcome: it is urgently needed and has the potential to become a crucial element of the EU's legislative framework to achieve a more environmentally friendly, efficient, competitive and secure electricity supply in Europe. In principle, the proposal for the Directive addresses the right issues and the headings of its articles provide a workable structure to build upon. They cover most of the areas in which a legal base is needed, such as grid connection, administrative procedures, support mechanisms, ensuring the quality of CHP, investigating the potential for CHP in Member States, and the barriers to its realization. This provides a good starting point.

In particular, Article 8 of the proposed Directive, which deals with issues regarding the interface between CHP installations and the electrical grid system, is positive. The requirements, procedures and costs for network connection and use are traditionally one of the most important barriers used to prevent and discriminate against CHP. The suggested provisions are similar to rules issued in another European legislative measure, the so-called Renewables Directive,⁶ and quite comprehensively address most of the existing problems. In addition, currently discussed amendments to the European Electricity Directive,⁷ which are likely to be adopted in 2003, will probably complement this part by establishing further rules to create a more level playing field between all electricity producers. Together, this legal framework will undoubtedly create fairer and more transparent conditions for grid connection and use.

There are, however, a number of points where the CHP Directive could be improved and strengthened.

THE PURPOSE OF THE DIRECTIVE

At the time the Commission announced its intention to propose a CHP Directive, the Renewables Directive had just been adopted. Article 1 of this Directive clearly states what it is supposed to achieve, namely to 'promote an increase in the contribution of renewable energy sources to electricity production in the internal market for electricity.' Yet Article 1 of the proposed CHP Directive limits the Directive's purpose to creating 'a framework for the promotion of cogeneration' without mention of any increase of the share of electricity production from CHP that should follow as a result of this. In other words, the Directive wants to encourage the *promotion*, but not necessarily the *growth*, of CHP. This observation might appear over-subtle. Yet, the Directive should, here and in some other parts, be more ambitious than it is at the moment.

CHP TARGETS AND POTENTIALS

The Commission's CHP Strategy from 1997 set a target to double the percentage of the EU-wide electricity production from CHP, from 9% to 18% by 2010. The political will to reach this target has since then been confirmed in three major EU policy documents: the *Energy Efficiency Action Plan* from 2000, the *Green Paper on Security of Supply* from 2001, and the Community's *6th Environmental Action Programme*, issued in 2002.⁸ On the practical side, the future cogen study has provided evidence that ambitious policies could attain this objective in principle, even though the chances of getting there in time now seem remote.

It is therefore inexplicable why the proposal for the CHP Directive avoids any reference to the 18% target, or any other concrete figure for an increase of cogeneration at Member State or EU level. Article 6 in the proposal would only require governments to identify their national potentials for CHP. Based on these, according to the explanatory statement, 'the Commission could examine the possibility and need for such targets.' This sounds very cautious and would, according to the suggested timetable, probably not occur before 2009-10. It would be much better if the identification of national potentials were used, as a second step, to establish national targets for increasing cogeneration. Such provision in the Directive would give national policies a much clearer sense of ambition and direction, and provide good benchmarks for policy evaluation.

Again, the Renewables Directive provides a model in this respect. It established a 22.1% indicative share of electricity produced from renewable energy sources in total Community

electricity consumption by 2010, and defined reference values as a preliminary stage for the definition of indicative targets for individual Member States.

It is also necessary, in formulating the Directive itself, whether technical or economical potentials for CHP are asked for and, if the latter is the case, under what conditions it should be assessed. That is, whether cogeneration should be compared with separate heat and power production on the basis of present electricity prices, or on long-term marginal prices of separate production, or whether external costs are internalized into the fuel prices or not, whether grid connection costs are included, etc.

SUPPORT POLICIES, BUT WITH LIMITS

One of the most contested parts of the proposal is a statement in the preamble to the draft Directive to concentrate CHP support policies on units with a capacity of less than 50 MWe or, in larger installations, to support only the amount of electricity produced by the capacity below this threshold. It is in all probability no accident that the European Commissioner for Energy and Transport (a Spanish national) is said to be behind this limit, because exactly the same legal requirement exists in Spain - but nowhere else in Europe.

As part of the preamble to the Directive, this restriction would not become automatically binding for national policies. Yet, it would have great judicial impact by providing an indication on how its legal provisions have to be interpreted, thereby pushing the door open to all kinds of lobbying, lawsuits and political action against support policies for large CHP installations. In practice, the existence of such a limit could result in the construction of undersized installations and therefore lead to reduced energy and carbon dioxide savings. The environmental benefits from CHP installations do not cease to exist from a capacity of 50 MWe! A preliminary estimate by COGEN Europe shows that roughly 40% of CHP capacity and electricity production in the EU could be affected by this provision. This would directly and massively undermine the very reason to develop the CHP Directive.

The justification that larger CHP installations would have 'easier access to more favourable financing and fuel prices' is true only in a few cases, because it depends not on the capacity of individual installations but on the purchasing power of the operating company. Also, financial support is often granted preferably to small installations that realize benefits from avoided network costs. There is, therefore, no justification to keep this threshold.

ENSURING HIGH QUALITY CHP

The wording of the proposed Directive repeatedly displays a paranoia for fraudulent heat dumping. This suspicion has inspired strong emphasis on CHP based on useful (i.e. 'economically justified') heat demand. In general, COGEN Europe believes that the amount of heat misuse in the European CHP sector amounts to much less than 1% of the total production. Thus it is unreasonable for the Directive to be so heavily negative.

Article 9 involves a particular risk, with its demand that national administrative procedures would have to encourage 'the design of cogeneration installations to match economically justified demands for heat output and avoid production of more heat than useful heat.' Some CHP plants used for heating purposes need to be able to generate electricity independently from heat demand in order to avoid the purchase of expensive electricity - notably at peak hours - during periods of low heat demand. This means, they have to dispose of their heat through condensators, bypasses or supplementary coolers in order to be able to operate economically. If this provision were maintained it could be used to prevent economically viable CHP plants.

In general, the obsession with heat demand and high quality CHP is unnecessary, because the definition and methodology suggested in Annex II of the Directive will prevent that condensing power can be labelled as electricity from CHP. The calculation will take non-CHP electricity, for the most part, away from the total electricity output of the plant. This excludes support to electricity, which is not produced simultaneously together with useful heat (except in marginal quantities), in accordance with the proposed rules.

DEFINITIONS AND EFFICIENCY CRITERIA

The proposed Directive would create a harmonized EU-wide methodology and basic definitions with regard to electricity from CHP and the efficiency of installations. In a nutshell, it suggests a two-step approach.

1. The non-CHP electricity would be separated from power produced in the CHP mode, i.e. with simultaneous use of the heat. If the annual overall efficiency reaches at least 75% (for certain plants, 85%), the total electricity output would be considered CHP. If these values are not reached, the electricity from cogeneration would be defined as the product of net heat production and power to heat ratio.
2. The efficiency of the CHP plant would be calculated by comparing it with a reference system of separate heat and power production. The reference system for existing CHP plants would be the existing fossil-fuelled thermal electricity mix in each EU Member State. For new CHP units, it would be the efficiency achieved by the best available technique for separate production, based on the same fuel. When the CHP plant achieves certain primary energy savings against the reference case it would qualify as 'high-efficiency' CHP and should become eligible for favourable treatment. A 5-10% efficiency gain due to avoided network losses from decentralized CHP may be taken into account.

The debate on the CHP Directive is expected to have a very close look at these propositions, notably the efficiency issue. The German CHP Association B.KWK agrees in principle with the two-step approach, i.e. with the separation of non-CHP electricity and the comparison of CHP with a reference system of separate production. Yet, it also comes up with improvements,⁹ including the following:

- A more precise calculation of the power to heat ratio for each individual CHP unit, where this should be defined as the ratio between net electricity production to useful heat output when operating at full power (under standardized conditions) and maximum output of useful heat, i.e. in back pressure mode in the case of steam turbines, excluding the use of supplementary coolers and/or exhaust bypass, and for gas turbines also supplementary firing.
- A simplified procedure for small CHP, where the total power output from installations smaller than 1 MWe from serial production should be considered electricity from CHP if proof is given of a full load efficiency of at least 75% and that no devices exist to remove the heat.
- There should be different reference cases. B.KWK considers the method to calculate the efficiency of CHP presented in Annex III to be an acceptable compromise, but only if new cogeneration capacities are compared with a mixture of new and existing condensing power plant capacities, and not only with new plants as suggested in the proposal. The Association assumes that due to European-wide production overcapacities, new CHP will for a long period generally not prevent new condensing power plants but replace electricity from existing plants.

SPEEDING UP THE DEVELOPMENT OF CHP

Article 9 of the draft Directive proposes a number of requirements on how national administrative frameworks and procedures should be made more conducive to the promotion of CHP by reducing bureaucratic barriers, enhancing co-ordination between the different parts of administration involved, establishing fair and transparent procedures, and providing the possibility of fast-track planning procedures for CHP. This is welcome, because unnecessary red tape and inappropriate procedures have been identified in previous exercises as another important obstacle to a more successful development of CHP.¹⁰

However, care should be taken to ensure that the proposed Directive itself does not increase red tape. At the moment, Articles 10 and 11 request Member States to undertake a large number of assessments, evaluations and reporting requirements but does not sufficiently clarify what purpose and consequences all the information gathering is supposed to have. One example is the requirements related to identification of national potentials for high-efficiency CHP. At present, it remains unclear:

- what happens if the identification of national cogeneration potential is flawed and/or if the results are obviously too low
- how the quality of the reports is being assessed
- how Member States would need to remove identified barriers to CHP
- what would happen if Member States make no progress in realizing their national potential, or even reduce cogeneration

- how the Commission would react to any risk that the percentage of cogeneration would diminish even further.

The timetable of the reporting duties should also be tightened to make the Directive more effective. At present, the first reports from Member States to the European Commission would have to be submitted by 2005 at the latest, and the Commission's reaction, in form of a report to the Parliament and the Council of Ministers, would appear around 2007. This means that new EU initiatives in reaction to observed shortcomings, problems etc. could not be issued before 2009/10 for the first time. This seems far too slow for implementing a mature technology which is already readily available on the market. The opportunity to boost cogeneration to meet the EU's Kyoto commitments would be put at risk, and the European Commission would effectively have no real grip on the development of CHP in Europe for approximately seven years.

SO WHAT'S NEXT?

Whilst the principal structure and themes in the draft Directive form a good starting point, some parts give the impression that those in the European Commission ultimately responsible for the proposal were not fully convinced of the need for a strong and effective European framework for CHP. The draft text should therefore be strengthened and further developed, taking the above-mentioned points into account if the current downward trend in CHP development is to be reversed and if the conditions to unleash the potential for more CHP are to be created. With the publication of the proposal for the Directive, it is now up to the politicians in the European Parliament and the Council of Ministers to take the necessary steps. Both bodies have already started their preparations for the decision-making process, where they will share equal power under the so-called co-decision procedure. The whole procedure may take between one and two years. COGEN Europe will closely follow it and lead the arguments to strengthen the Directive.

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