



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 23.7.2003  
COM(2003) 416 final

2002/0185 (COD)

Amended proposal for a

**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**

**on the promotion of cogeneration based on a useful heat demand in the internal energy  
market**

(presented by the Commission pursuant to Article 250 (2) of the EC Treaty)

## **EXPLANATORY MEMORANDUM**

### **A. Principles**

1. In July 2002, the Commission submitted a proposal for a Directive of the European Parliament and the Council on the promotion of cogeneration based on a useful heat demand in the internal energy market COM(2002) 415 – 2002/0185 for adoption by the co-decision procedure laid down in Article 251 and 175(1) of the Treaty establishing the European Community.
2. On 14 May 2003, the European Parliament adopted a series of amendments at its first reading. The Commission gave its position on each of these amendments at that time, indicating those amendments it could accept as they are, those that could be accepted in principle and/or with redrafting, those that could be accepted in part and those that could not be accepted.
3. In the light of this, the Commission has drafted this amended proposal.
4. The Commission has made three types of amendments with the following justifications.

Firstly, a number of new provisions have been accepted from the first reading by the European Parliament as they are. These amendments serve to improve the technical and financial definitions or they add balance and clarity and elaborate and illustrate points in the proposal.

Secondly, the Commission has accepted some amendments in principle, although with minor redrafting, e.g. to improve consistency with other parts of the proposal or to define more clearly certain conditions, limits or exceptions.

Thirdly, the Commission has taken parts of amendments from the first reading when these specific parts were deemed consistent with the purpose of the proposal and provided substantial added value while for the amendment in its entirety this was not the case.

### **B. Comments as regards the accepted amendments**

#### **Recitals**

##### *Recital 3*

This change of the recital makes a reference to the resolution of the European Parliament on the Green Paper in support for incentives for the creation of efficient energy production such as cogeneration.

##### *Recital 5*

This change of the recital deletes one word. The message of the word “..correct ..” is covered elsewhere and it makes no essential change to the text.

##### *Recital 6*

This change of the recital gives more focus on the objective of primary energy savings.

#### *Recital 7*

This is a new recital providing a relevant reference to Directive 2002/91/EC on the energy performance of buildings, in which it is required to evaluate installation of CHP in new buildings above 1000 m<sup>2</sup>.

#### *Recital 12*

This change of the recital deletes the words referring to national reference values for separate production. In the present proposal harmonised reference values are to be developed and as a consequence the reference to national values is not relevant.

#### *Recital 13*

This new recital stress that calculations must be precise, easy to follow, harmonised and adjustable and must avoid unnecessary administrative efforts and market distortions.

#### *Recital 18*

This change of the recital deletes the reference to the 50MW threshold for Member State support. The threshold has been criticised heavily in the European Parliament as well as in Council and the Commission has accepted to delete it.

#### *Recital 23*

This new recital makes it clear that also cogeneration produced and consumed by the by the producer himself should be counted into the statistics in order to give the full picture of cogenerated energy.

#### *Recital 24*

This change of the recital is linked to the deletion of the three categories of cogeneration “industrial”, “heating” and agricultural cogeneration”.

#### *Recital 25*

The change of this recital underlines that the measures taken aim to increase the share of cogeneration in the Community’s total power production.

### **Articles**

#### *Article 3 Definitions*

- (a) is changed to be consistent with the rest of the text.

The three categories of cogeneration are deleted as they were criticised as not needed in the European Parliament as well as in the Council.

- (b) is a new definition of “micro-cogeneration” as units below 50kWe. This definition also covers a part of amendment 34.

- (c) is a new definition saying that micro-cogeneration with an overall efficiency above 80% shall be regarded as high efficiency cogeneration. Thereby the route for approval as high efficiency cogeneration is eased because once proved above this

threshold no further calculations for each unit is needed. This definition also covers a part of amendment 34.

(d) is changed to give clarification and to include amendment 65 to Annex I. Inclusion of “trigeneration” into the list of cogeneration technologies in Annex I is not consistent because trigeneration is not a cogeneration technology but an application of the cogeneration output.

(e) is changed to clarify the definition.

The previous definitions of “district heating” and “district cooling” are deleted because these terms are not used in the directive.

(h) this change clarifies that the heat losses in the district heating distribution system shall not be taken into account in the assessment of the heat efficiency.

(k) is changed to clarify the wording according to amendment 79, however the last part of this amendment is not introduced because it is covered by amendment 68 (Annex II)

(n) is changed in accordance with amendment 32 but modified because the amendment is closely linked to the not accepted amendment 70. To make the text consistent the definition is only including the capacity related power to heat ratio.

(o) is changed to clarify the wording.

(p) is changed to clarify the wording.

#### *Article 4*

The timeframe in paragraph 1 is changed from two to one year in order to speed up the implementation process.

Likewise the timeframe in paragraph 2 is changed from one year to six month.

The Commission can in principle accept these changes, but it must be noted that Member States most likely will be opposed to these changes.

#### *Article 5*

The article is amended to introduce harmonised reference values for separate production to be used instead of national values (amendment 42). Using harmonised reference values will reduce market distortions and contribute to the creation of a level playing field. The harmonised values must be established based on comprehensive studies and including consultations with the sector. The study must be established by the Commission and finally adopted in accordance with a procedure including establishment of a Committee (see Article 12).

As a consequence of introducing the harmonised reference values the paragraphs dealing with national reference values are deleted.

### *Article 6*

Paragraph 1 is amended in order to specify that the analysis shall include specific analysis of the potentials for efficient micro-cogeneration.

The amendments in paragraph 2, 3 and 5 are a consequence of introducing the text originally proposed by the Commission in annex IV into the Article.

The timeframe in paragraph 5 is changed from two years to 18 months, respectively from three years to two years. The Commission can in principle accept these changes, but it must be noted that Member States most likely will be opposed to these changes.

### *Article 7*

A new paragraph 4 is added to clarify that Member States' support programmes must be non-discriminatory.

### *Article 8*

It was proposed in amendment 40 – and accepted by the Commission - to bring forward this Article as a new Article 5. This change has however not yet been made as the order of the articles may be changed at a later stage.

In paragraph 8 it is added, as proposed in part of amendment 54, that transmission and distribution system operators are not allowed to impose unrealistic connection fees for connecting cogeneration units below 1 MWe just as costs and administrative burdens must be reduced to an absolute minimum. Furthermore the production from these units must be guaranteed a fair price for electricity sold to the grid. This amendment contribute to establish and safeguard reasonable conditions for the small scale producers.

### *Article 9*

In paragraph 1 (a) the wording is changed in order to reflect amendment 55 and thereby underlining that the aim is to obtain energy savings. To keep also the original message the amendment is adapted, because it is prerequisite to energy savings that an increase in heat consumption is avoided.

### *Article 10*

The timeframes for Member States' reporting are shortened in the changes in this article in order to speed up the implementation. The Commission can in principle accept these changes, but it must be noted that Member States most likely will be opposed to these changes.

The sections dealing with national reference values are deleted in order to be consistent with the changes in Article 5.

### *Article 11*

In paragraph 1 the former (a) is deleted in order to be consistent with the changes in Article 5.

### *Article 13*

This new article introduces a Committee as an efficient way of dealing with the detailed technical aspects of the establishment of harmonised reference values as outlined in Article 5.

### *Annexes*

#### *Annex I*

It is clarified that this Directive does not include any nuclear production as proposed in amendment 64 and 66. In amendment 65 it is proposed to include a new technology “trigeneration”. However “trigeneration” is not a genuine technology but a more refined application of cogeneration, but the amendment is reflected in the changes of Article 3 (d).

#### *Annex II*

The changes of Annex II reflect amendment 67, however since the Commission cannot accept amendment 70 containing the detailed calculation method with new notations for all factors it is necessary to modify the text to reach a consistent proposal. This modification includes that the original notations ( $E_{\text{CHP}}$ ,  $Q_{\text{net}}$ , C) are maintained and that the power to heat ratio is defined as the capacity related power to heat ratio.

A new section c) is introduced according to amendment 68 reflecting special conditions for some industrial units, however the text is modified to be consistent with the rest of the text.

A new section d) is introduced as proposed in amendment 69. The text is modified in order to clarify that the outcome of a standardisation process in CEN or CENELEC must be approved in the committee (Article 12) before Member States are allowed to use such a methodology. It is important for the Commission that it is possible to take in a fruitful product of the standardisation process, but also to ensure that this is not the case if the result of the standardisation process is unsatisfactory.

#### *Annex III*

This annex is changed in order to reflect amendment 71. The Commission welcomes that this amendment maintains the principle of calculation of primary energy savings as important for determination of high efficiency cogeneration. However the Commission has reservations on the formula proposed in this amendment and it is as a consequence proposed to maintain the original formula. It is also taken onboard that the avoided grid losses obtained by distributed cogeneration units should be taken into consideration.

#### *Annex IV*

This annex is deleted because the content is introduced directly into Article 6.

Amended proposal for a

**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**  
**on the promotion of cogeneration based on a useful heat demand in the internal energy market**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175 thereof,

Having regard to the proposal from the Commission<sup>1</sup>

Having regard to the opinion of the **European** Economic and Social Committee<sup>2</sup>

Having regard to the opinion of the Committee of the Regions<sup>3</sup>

Acting in accordance with the procedure laid down in Article 251 of the Treaty<sup>4</sup>

Whereas:

- (1) The potential for use of cogeneration as a measure to save energy is underused in the Community at present. Promotion of high-efficiency cogeneration based on a useful heat demand is a Community priority given the potential benefits of cogeneration with regard to saving primary energy and reducing emissions, in particular of greenhouse gases. In addition, efficient use of energy by cogeneration can also contribute positively to the security of energy supply and to the competitive situation of the European Union and its Member States. It is therefore necessary to take measures to ensure that the potential is better exploited within the framework of the internal energy market.
- (2) Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity<sup>5</sup> provides for an important step in the completion of the internal market in

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<sup>1</sup> OJ C....., p.

<sup>2</sup> OJ C....., p.

<sup>3</sup> OJ C....., p.

<sup>4</sup> OJ C....., p.

<sup>5</sup> OJ L 27, 30.1.1997, p.20.

electricity. At its meeting in Lisbon on 23 and 24 March 2000, the European Council called for rapid work to be undertaken to complete the internal market in both electricity and gas and to speed up liberalisation in these sectors with a view to achieving a fully operational internal market. In response, the Commission adopted on 13 March 2001 a package of measures on completing the internal energy market, including a proposal for a Directive amending Directives 96/92/EC and 98/30/EC concerning common rules for the internal market in electricity and natural gas<sup>6</sup>.

- (3) The Green Paper<sup>7</sup> on security of energy supply points out that the European Union is extremely dependent on its external energy supplies currently accounting for 50% of requirements and projected to rise to 70% by 2030 if current trends persists. Import dependency and rising import ratios ~~may lead to concern about~~ **heightens** the risk of interruption to or difficulties in supply. However, it would be simplistic and wrong to conceive security of supply as merely a question of reducing import dependency and boosting domestic production. Security of supply calls for a wide range of policy initiatives aimed at, inter alia, diversification of sources and technologies and improved international relations. The Green Paper emphasised furthermore that security of energy supply is essential for a future sustainable development. The Green Paper concludes that the adoption of new measures to reduce energy demand is essential both in terms of reducing the import dependence and in order to limit greenhouse gas emissions. **In its resolution of 15 November 2001<sup>8</sup> on the Green Paper, the European Parliament calls for incentives for the creation of efficient energy production plants, including cogenerations plants.**
- (4) The Commission's Communication "A Sustainable Europe for a better world – A European Union Strategy for Sustainable Development"<sup>9</sup> presented at the Gothenburg European Council on 15 and 16 June 2001 identified climate change as one of the principal barriers to sustainable development and emphasised the need for increased use of clean energy and clear action to reduce energy demand.
- (5) The increased ~~correct~~ use of cogeneration constitutes an important part of the package of measures needed to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change, and of any policy package to met further commitments. The Commission in its Communication on the implementation of the first phase of the European Climate Change Programme<sup>10</sup> identified promotion of cogeneration as one of the measures needed to reduce the greenhouse gas emissions from the energy sector and announced its intention to present a proposal for a Directive on the promotion of cogeneration in 2002.

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<sup>6</sup> COM(2001) 125 final.

<sup>7</sup> COM(2000) 769 final

<sup>8</sup> **OJ C 140 E, 13.6.2002, p. 543.**

<sup>9</sup> COM(2001) 264 final

<sup>10</sup> COM(2001) 580 final

- (6) The increased ~~correct~~ use of cogeneration **geared towards making primary energy savings** is a priority as outlined in the Communication “A Community strategy to promote combined heat and power (CHP) and to dismantle barriers to its development”<sup>11</sup>. This was endorsed by the Council in its resolution of 18 December 1997 on a Community strategy to promote combined heat and power<sup>12</sup>, and by the European Parliament in its resolution of 23 April 1998 on the Community strategy to promote combined heat and power<sup>13</sup>.
- (7) **Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings<sup>14</sup> requires Member States to ensure that for new buildings with a total surface area of over 1000 m<sup>2</sup>, the technical, environmental and economic feasibility of alternative systems, such as CHP, is considered and taken into account before construction starts.**
- ~~(7)~~(8) The Council in its Conclusions of 30 May 2000 and of 5 December 2000<sup>15</sup> endorsed the Commission’s Action Plan on energy efficiency<sup>16</sup> and identified promotion of cogeneration as one of the short-term priority areas. The European Parliament in its resolution of 7 February 2001<sup>17</sup> on the Action Plan on energy efficiency called on the Commission to submit proposals establishing common rules for the promotion of cogeneration, where this makes environmental sense.
- ~~(8)~~(9) Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control<sup>18</sup>, Directive 2001/80/EC of the European Parliament and of the Council on the limitation of emissions of certain pollutants into the air from large combustion plants<sup>19</sup> and Directive 2000/76/EC of the European Parliament and of the Council on the incineration of waste<sup>20</sup> all recite the need to evaluate the potential for cogeneration in new installations.
- ~~(9)~~(10) High efficiency cogeneration is in this directive defined by the energy savings obtained by combined production in stead of separate production of heat and electricity. For existing plants energy savings of more than 5%, and for new plants energy savings of more than 10% qualify for the term ‘high efficiency cogeneration’. To maximise the energy savings and to avoid that energy savings are lost through incorrect operation of the cogeneration plants the greatest

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11 COM(97) 514 final

12 OJ C 4, 8.1.1998, p. 1

13 A4-0145/98

14 **OJ L 1, 4.1.2003, p. 65.**

15 Council Conclusions 8835/00 (30 May 2000) and Council Conclusions 1400/00 (5 December 2000).

16 COM(2000) 247 final

17 A5-0054/2001.

18 OJ L 257, 10.10.1996, p. 26

19 OJ L 309, 27.11.2001, p. 1

20 OJ L 332, 28.12.2000, p. 91

attention must be paid to the functioning conditions of these plants, mainly to ensure that the heat production is being properly used.

~~(10)~~**(11)** It is important for monitoring purposes and for reasons of transparency to adopt a harmonised basic definition of cogeneration. Where cogeneration installations are equipped to generate separate electricity or heat production, such production should be excluded from the definition of cogeneration.

~~(11)~~**(12)** To ensure that only cogeneration that provides benefits in terms of primary energy savings is promoted, it is necessary to develop additional criteria to determine and ~~quantify~~ **assess** the energy efficiency of the cogeneration production identified under the basic definition. ~~To avoid distortions of the internal energy market, national efficiency reference values used to define high-efficiency cogeneration should be adopted on the basis of a common methodology.~~

**(13) The methods used to calculate energy produced from cogeneration and energy savings through cogeneration must be sufficiently precise, easy to follow, harmonised at European level and adjustable to take account of technical progress, and must avoid unnecessary administrative effort and distortions on the internal energy market.**

~~(12)~~**(14)** The definitions of cogeneration and of high-efficiency cogeneration used in this Directive do not prejudice the use of different definitions in national legislation, for purposes other than those set out in this Directive. It is appropriate to borrow the definitions contained in Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market of electricity<sup>21</sup> and in Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.<sup>22</sup>

~~(13)~~**(15)** To increase transparency for the consumer's choice between electricity from cogeneration and electricity produced on the basis of other techniques, guarantee of origin of high efficiency cogeneration is necessary.

~~(14)~~**(16)** To ensure increased market penetration of cogeneration in the medium term, it is appropriate to require all Member States to adopt and publish a report analysing the national potential for high-efficiency cogeneration and to include a separate analysis of barriers to cogeneration in the report. The Commission, on the basis of these reports and the progress made in achieving the global indicative Community target of 18% of electricity consumption from cogeneration by 2010, should consider whether it is appropriate to establish indicative objectives for each Member State. Special considerations should be given to analysing the scope

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21 OJ L 27, 30.01.1997, p.20

22 OJ L 283, 27.10.2001, p.33

for increased use of renewable energy sources in the national heat markets via cogeneration.

~~(15)~~**(17)** Public support should be consistent with the provisions of the Community guidelines on State aid for environmental protection<sup>23</sup>. These guidelines currently allow certain types of public support if it can be shown that the measures are beneficial in terms of protection of the environment because the conversion efficiency is particularly high, because the measures will allow energy consumption to be reduced or because the production process will be less damaging to the environment. Such support will in some cases be necessary to further exploit the potential for cogeneration, in particular to take account of the need to internalise external costs.

~~(16)~~**(18)** Public support schemes for promoting cogeneration should focus on support for cogeneration based on a useful heat demand and avoid encouragement of increased heat demand in order to avoid increase of fuel consumption and CO<sub>2</sub> emissions. Member States should take steps to prevent public financial support for electricity from cogeneration from being used to subsidise heat production, thereby creating incentives for being less careful about the proper use of the heat output. ~~Without prejudice to the Community Guidelines on State aid for environmental protection, direct support for production should in principle be focused on the share of cogenerated electricity produced either in installations with a capacity below a threshold value that should be set at 50 MW(e) or lower or in larger installations but then only the amount of electricity produced by the capacity below such a threshold value.~~

~~(17)~~**(19)** Member States operate different mechanisms of support for cogeneration at the national level, including investment aid, tax exemptions or reductions, green certificates and direct price support schemes. The Commission intends to monitor the situation and report on experiences gained with the application of national support schemes.

~~(18)~~**(20)** Grid connection costs and tariffs related to the transmission and distribution of electricity from cogeneration and tariffs related to the purchase of additional electricity sometimes needed by cogeneration producers should be set according to objective, transparent and non-discriminatory criteria taking into account the costs and benefits of cogeneration. Especially for cogeneration installations using renewables and small ones with capacity below 1 MW(e), costs and administrative burdens in relation to connection to the electricity grid constitute considerable barriers for further development.

~~(19)~~**(21)** The specific structure of the cogeneration sector, which includes many small and medium-sized producers, should be taken into account, especially when

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<sup>23</sup> OJ C 37, 03.02.2001, pages 3-15

reviewing the administrative procedures for obtaining permission to construct cogeneration capacity.

~~(20)~~**(22)** Within the purpose of this Directive to create a framework for promoting cogeneration it is important to emphasise the need for a stable economical and administrative environment for investments in new cogeneration installations. Member States are encouraged to address this need by designing support schemes with a duration period of at least 4 years and by avoiding frequent changes in administrative procedures etc. Member States are furthermore encouraged to ensure that public support schemes respect the phase-out principle.

**(23) In collecting statistics Member States should analyse and monitor the amount of cogenerated electricity produced and consumed by the producer himself. Member States should be aware that even if such a production is not visible in the sense that it is sold or transmitted through the grid, it should be considered and counted as cogeneration. To establish a full overview of cogenerated production this type of production must be taken into account.**

~~(21)~~**(24)** The overall efficiency and sustainability of cogeneration is dependent on the many factors such as technology used, fuel types, load curves, the size, and also on the properties of the heat. ~~Use of heat as high pressure steam for industrial processes provides limits of the electrical efficiency of the cogeneration installation because of the high temperature level for the heat (above 140°C). Use of heat for central heating purposes, demanding a lower temperature level (from 40°C to 140°C) than the industrial use, allows a higher electrical efficiency of the cogeneration installation. Use of heat for agricultural heating, such as warming of greenhouses and aquaculture pools, provides an even lower level of temperature (below 40°C) and improves thereby the possibilities to increase the electrical efficiency. This Directive reflects these considerations by introducing three classes of cogeneration in order to ensure that evaluation of electrical efficiency of different cogeneration installations take the different heat temperature levels into consideration.~~ **These differences could be taken into consideration in preparation of harmonised reference values for separate production of heat and electricity.**

~~(22)~~**(25)** In accordance with the principles of subsidiarity and proportionality as set out in Article 5 of the Treaty, general principles providing a framework for the promotion of cogeneration in the internal energy market **and measures for increasing the share of cogeneration in the Community's total power production** should be set at Community level, but the detailed implementation should be left to Member States, thus allowing each Member State to choose the regime, which corresponds best to its particular situation. This Directive confines itself to the minimum required in order to achieve those objectives and does not go beyond what is necessary for that purpose.

HAVE ADOPTED THIS DIRECTIVE:

*Article 1*

**Purpose**

The purpose of this Directive is to create a framework for promotion of cogeneration based on useful heat demand in the internal energy market. Implementation of this Directive shall take into account the specific national circumstances especially concerning climatic and economic conditions.

*Article 2*

**Scope**

This Directive shall apply to cogeneration as defined in Article 3. Annex I provides a list of different types of cogeneration units covered by this Directive.

*Article 3*

**Definitions**

For the purpose of this Directive, the following definitions shall apply:

- (a) ~~“cogeneration” shall mean the generation in one process of thermal energy and electrical and/or mechanical energy. For practical reasons and based on the fact, that the use of the heat output for different purposes requires different temperature levels of the heat, and that these differences influence efficiencies of the cogeneration, cogeneration shall be divided into three classes: “industrial cogeneration”, “heating cogeneration” and “agricultural cogeneration”;~~
- (b) ~~“industrial cogeneration” shall mean the generation in one process of electrical and/or mechanical energy and thermal energy useful for industrial production generally with heat temperatures of 140°C or higher;~~
- (c) ~~“heating cogeneration” shall mean the generation in one process of electrical and/or mechanical energy and thermal energy useful for heating purposes in district heating systems or directly in buildings generally with heat temperatures between 40°C and 140°C;~~
- (d) ~~“agricultural cogeneration” shall mean the generation in one process of electrical and/or mechanical energy and thermal energy useful for agricultural heating of greenhouses, aquaculture plants and similar applications generally with heat temperatures between 15°C and 40°C;~~

- (b) **"micro-cogeneration" shall mean cogeneration in a cogeneration unit lower than 50 kW<sub>e</sub>;**
- (c) **"Efficient micro-cogeneration" shall mean micro-cogeneration with a certified overall efficiency of at least 80%;**
- (e)(d) "useful heat" is **shall mean** heat produced in a cogeneration process to satisfy an economically justified demand, ~~on the basis of the efficiency criteria laid down in Annex III, point e. 2;~~ useful heat could via a secondary process be used to generate useful cooling; **such as for industrial or airconditioning purposes (trigeneration);**
- (f)(e) "electricity from cogeneration" shall mean electricity generated ~~in accordance with the methodology laid down in Annex II and in a process~~ **during a reporting period directly** linked to **the** production of useful heat **from cogeneration in a cogeneration unit in accordance with the methodology laid down in Annex II;**
- (g) ~~"district heating" shall mean a system supplying commercially heat in the form of hot water or steam to users via a distribution network;~~
- (h) ~~"district cooling" shall mean a system supplying chilled water or hot water or steam to chillers via a distribution network;~~
- (i)(f) "back-up electricity" shall mean the electricity that has to be supplied through the electricity grid whenever the cogeneration process is disrupted or out of order;
- (j)(g) "top-up electricity" shall mean the electricity that has to be supplied through the electricity grid in cases where the electricity demand is greater than the electrical output of the cogeneration process.
- (k)(h) "heat efficiency" shall mean annual useful heat output divided by the fuel input used for heat produced in a cogeneration process and for gross electricity production. ~~In the case of cogeneration with district heating useful heat output is measured at the point of outlet to the heat distribution network decreased by a realistic estimation of losses in the distribution network. In the case of other cogeneration applications useful heat output is measured at the point of use;~~
- (i) "electrical efficiency" shall mean annual electricity production measured at the point of outlet of the main generators divided by the fuel input used for heat produced in a cogeneration process and gross electricity production;
- (m)(i) "overall efficiency" shall mean the annual sum of electricity production and useful heat output divided by the fuel input used for heat produced in a cogeneration process and gross electricity production;

- (n)(k) "efficiencies" shall ~~mean efficiency~~ **be** calculated on the basis of Net Calorific Values of fuels (lower calorific value) ~~which means that the latent heat of vaporisation of moisture is not included;~~
- (o)(l) "high efficiency cogeneration" shall mean cogeneration meeting the criteria outlined in Annex III;
- (p)(m) "efficiency reference value for separate production" shall mean efficiency of the alternative separate productions of heat and electricity that the cogeneration process is assumed to displace.
- (q)(n) "Power to Heat Ratio" shall ~~mean the relation of electrical energy to useful thermal energy~~ **of a cogeneration plant is the quotient of the electricity production from cogeneration and the heat production from cogeneration at full capacity over a measuring period.**
- (r)(o) "cogeneration unit" shall mean a unit ~~mainly intended for~~ **within a** cogeneration ~~processes~~ **plant, in which the process of cogeneration** as defined under point a) **partly or solely takes place**; ~~when a cogeneration unit generates only electrical energy or only thermal energy it is still to be defined as a cogeneration unit, but its output shall not be considered cogeneration for the purpose of this Directive.~~
- (s)(p) "cogeneration installation" shall mean an installation ~~made up of one or more~~ **intended principally for** cogeneration ~~units~~ **processes within the meaning of point (a) above.** A cogeneration installation may ~~include equipment where it is possible to generate~~ **have segments in which** only electrical energy or only thermal energy **are generated.** The output from such ~~equipment~~ **segments** shall not be considered cogeneration for the purpose of this Directive;
- (t)(q) "new cogeneration units" shall mean cogeneration units having started operation on, or after, 1 January 2004;
- (u)(r) "existing cogeneration units" shall mean cogeneration units having started operation before 1 January 2004;

In addition, the definitions in Directive 96/92/EC and in Directive 2001/77/EC shall apply.

#### *Article 4*

#### **Guarantee of origin of electricity from cogeneration**

1. Member States shall no later than ~~two~~ **one** years after the entry into force of this Directive ensure that the origin of electricity produced in cogeneration units can be guaranteed as such within the meaning of this Directive according to objective, transparent and non-discriminatory criteria laid down by each

Member State. Member States shall ensure that this guarantee of origin of the electricity is issued to this effect in response to a request.

2. Member States shall designate no later than ~~one year~~ **six months** after the entry into force of this Directive one or more competent bodies, independent of generation and distribution activities, to supervise the issue of the guarantee of origin referred in paragraph 1 Member States or the competent bodies shall put in place appropriate mechanisms to ensure that the guarantee of origin are both accurate and reliable and they shall outline in the report referred to in Article 6(34) the measures taken to ensure the reliability of the certificate system
3. Guarantee of origin shall:
  - specify the fuel source from which the electricity was produced, specify the use of the heat generated together with the electricity and finally specify the dates and places of production;
  - specify the quantity of electricity from cogeneration that the guarantee represents;
  - specify the efficiency reference values for separate production of electricity and heat, and the efficiency of cogeneration in accordance with Article 5;
  - enable producers of electricity from cogeneration to demonstrate that the electricity they sell is produced from cogeneration within the meaning of this Directive.

Member States may include additional information on the guarantee of origin.

4. Guarantee of origin, issued according to paragraph 2, shall be mutually recognised by the Member States, exclusively as proof of the elements referred in paragraph 3. Any refusal to recognise a certificate of origin as such proof, in particular for reasons relating to the prevention of fraud, must be based on objective, transparent and non-discriminatory criteria. In the event of refusal to recognise a certificate of origin, the Commission may compel the refusing party to recognise it, particularly with regard to objective, transparent and non-discriminatory criteria on which such recognition is based.

#### *Article 5*

#### **Efficiency criteria**

1. **In order to determine the energy savings and the reductions in CO<sub>2</sub> levels resulting from a cogeneration process as defined in this Directive, the Commission** ~~Member States~~ shall no later than two years after **following** the entry into force of ~~this~~ Directive ~~ensure that the efficiency of cogeneration~~

~~production, defined in terms of achievement of primary energy savings can be determined in accordance with Annex III~~ **and after consulting associations representing the cogeneration sector, the Member States, the European Parliament and the Council, present an in-depth analysis with regard to establishing general principles for comparing cogeneration with harmonised reference values for the separate production of heat and electricity.**

**The report referred to in the first paragraph should be based on a fully documented analysis, taking account of :**

- a) **operating data under realistic conditions,**
- b) **climatic differences in the Member States,**
- c) **the different technologies in the Member States,**
- d) **differentiation between existing and new installations,**
- e) **access to fuels, the distribution of energy resources and the development of the energy mix,**
- f) **security of supply and environmental aspects.**

2. ~~For the purpose of determining the efficiency of cogeneration, Member States~~ **On the basis of this analysis, the Commission shall not later than two years after the entry into force of this Directive adopt: publish, in accordance with the procedure in Article 13.2, harmonised reference values for determining primary energy savings by cogeneration.**

~~(a) efficiency~~ **The reference values for separate production of heat and electricity and of separate production of heat shall be the same in all EU countries.** ~~to be used for the calculation of primary energy savings from cogeneration in accordance with the methodology set out in Annex III.~~

- **These reference values shall be set by fuel type.**
- **The reference values shall be set for a specific cogeneration unit in the year of installation of the cogeneration unit and of the separate units of the same age.**
- **Once a set of reference values is set for a specific cogeneration unit these reference values are valid for a period of ten years and after that for a new period of ten years. The recalibrated reference values shall be based on the final year of this ten year period.**

- (b) ~~principles for defining the national efficiency reference values for separate production of heat and electricity based on a well-documented analysis of the most realistic references in each Member State.~~
3. ~~Member States shall review the national efficiency reference values for separate production of heat and electricity every 5 years to take account of technological developments and changes in the distribution on energy sources. Where changes in the national efficiency reference values for separate production are made, the new reference values shall be published and shall be notified to the Commission.~~
4. ~~The Commission shall evaluate the criteria for determining the efficiency of cogeneration adopted by the Member States pursuant to (paragraph 2). After having consulted the Member States, the Commission shall in the report referred to in Article 10 (1), consider the scope for a harmonised methodology that Member States could follow in order to determine the efficiency of cogeneration production.~~

#### *Article 6*

##### **National potentials for high-efficiency cogeneration**

1. Member States shall establish an analysis of the national potential for high-efficiency cogeneration, **including efficient micro-cogeneration, considering achieving the maximum energy and CO<sub>2</sub> savings possible from cogeneration in each Member State.**
2. The analysis shall comply with the criteria ~~listed in Annex IV~~ **below**. It shall be based on well-documented scientific data.

**In assessing national potentials for cogeneration, the analysis shall consider :**

- **The type of fuels that are likely to be used to realise the cogeneration potentials, including specific considerations on the potential for increasing the use of renewable energy sources in the national heat markets via cogeneration.**
- **The type of cogeneration technologies as set out in Annex I that are likely to be used to realise the national potential.**
- **The type of separate production of heat and electricity that high-efficiency cogeneration is likely to substitute.**
- **A division of the potential into modernisation of existing capacity and construction of new capacity.**

~~and shall~~ **The analysis may for statistical purposes** distinguish between applications of cogeneration in at least the following categories:

- industrial cogeneration
- heating cogeneration
- agricultural cogeneration

**3. The analysis shall include appropriate mechanisms to assess the cost-effectiveness of increasing the share of high-efficiency cogeneration in the national energy mix. The analysis of cost-effectiveness shall also take into account national commitments accepted in the context of the climate change commitments accepted by the Community pursuant to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.**

~~34.~~ Member States shall include in the analysis a separate analysis of barriers, which may prevent the realisation of the national potential for high-efficiency cogeneration. In particular, this analysis shall consider barriers relating to the prices of and access to fuels, barriers in relation to grid system issues, barriers in relation to administrative procedures, and barriers relating to the lack of internalisation of the external costs in energy prices.

~~45.~~ Member States shall for the first time not later than ~~two years~~ **18 months** after the entry into force of this Directive and thereafter every ~~three~~ **two** years evaluate progress towards increasing the share of high-efficiency cogeneration. Member States shall also evaluate measures taken to promote high-efficiency cogeneration and indicate to what extent the measures are consistent with national climate change commitments.

**The analysis of the national cogeneration potential shall specify the potentials in relation to the timeframes 2010, 2015 and 2020 and include appropriate cost estimates for each of the timeframes.**

~~56.~~ On the basis of the reports referred to in paragraphs 1, ~~34~~ and ~~45~~, the Commission shall assess how much progress Member States have made towards realising their national potentials for high-efficiency cogeneration.

The Commission shall publish its conclusions in the report referred to in Article ~~1011~~, for the first time not later than four years after the entry into force of this Directive and thereafter every three years.

## Article 7

### Support schemes

1. Member States shall ensure that support for cogeneration production is based on the useful heat demand, in the light of opportunities available for reducing energy demand through other economically feasible measures like energy efficiency measures.
2. Without prejudice to Articles 87 and 88 of the Treaty, the Commission shall evaluate the application of support mechanisms used in Member States according to which a producer of cogeneration receives, on the basis of regulations issued by public authorities, direct or indirect support, which could have the effect of restricting trade.

The Commission shall consider whether those mechanisms contribute to the pursuit of the objectives set out in Articles 6 and 174(1) of the Treaty.

3. The Commission shall in the report referred to in Article ~~40~~**11** present a well-documented analysis on experience gained with the application and coexistence of the different support mechanisms referred to in paragraph 2. The report shall assess the success, including cost-effectiveness, of the support systems in promoting the use of high-efficiency cogeneration in conformity with the national potentials referred to in Article 6. The report shall further review to what extent the support schemes have contributed to the creation of stable conditions for investments in cogeneration.
4. **The Member States shall ensure that support for cogeneration is provided in a non-discriminatory way, i.e. irrespective of operators and of the use of the electricity, mechanical energy or heat generated in the cogeneration installation.**

## Article 8

### Electricity grid system issues

1. Without prejudice to the maintenance of the reliability and safety of the grid, Member States shall take the necessary measures to ensure that transmission system operators and distribution system operators in their territory guarantee the transmission and distribution of electricity produced from cogeneration.
2. Member States shall establish a legal framework or require transmission system operators and distribution system operators to set up and publish standard rules on the bearing of the costs of technical adaptations, such as grid connections and grid reinforcements, which are necessary in order to integrate new producers feeding into the grid electricity produced from cogeneration.

Member States shall establish a legal framework or require transmission system operators and distribution system operators to set up and publish standard rules relating to the sharing of costs of system installations, such as grid connections and reinforcements, between all system users benefiting from them.

The sharing shall be enforced by a mechanism based on objective, transparent and non-discriminatory criteria taking into account the benefits which initially and subsequently connected producers as well as transmission system operators and distribution system operators derive from the connections.

The rules shall be based on objective, transparent and non-discriminatory criteria taking particular account of all the costs and benefits associated with the connection of the producers to the grid. The rules may provide for different types of connection.

3. Member States may require transmission system operators and distribution system operators to bear, in full or in part, the costs referred to in paragraph 2.
4. Transmission system operators and distribution system operators shall be required to provide any new producer wishing to be connected with a comprehensive and detailed estimate of the costs associated with the connection.
5. Member States shall ensure that the charging of transmission and distribution fees does not discriminate against electricity from cogeneration. Where appropriate, Member States shall put in place a legal framework or require transmission system operators and distribution system operators to ensure that fees charged for the transmission and distribution of electricity from installations using cogeneration reflect realisable cost benefits resulting from the installation's connection to the network. Such cost benefits may arise from the direct use of the low-voltage grid.
6. Unless the cogeneration producer is an eligible customer under national legislation within the meaning of Article 17 (2) of Directive 96/92/EC, Member States shall take the necessary measures to ensure that the tariffs for the purchase of electricity to back-up or top-up electricity generation are set on the basis of published tariffs and terms and conditions. Such tariffs and terms and conditions shall be fixed or approved in accordance with objective, transparent and non-discriminatory criteria by an independent regulatory authority prior to their entry into force.
7. Member States shall designate one or more competent bodies, which may be an independent regulatory authority, to monitor and benchmark the tariffs and terms and conditions offered to cogeneration producers when back-up or top-up electricity is purchased or when excess electricity is sold. The body shall publish for the first time three years after the entry into force of this Directive and thereafter every third year a report outlining the findings of these assessments. The report shall be forwarded to the Commission.

8. Member States shall particularly facilitate access to the grid system of electricity produced from cogeneration units using renewables energy sources and installations with a capacity less than 1 MWe, as set out in Annex III, a). **In particular, by requiring Transmission and Distribution system operators to connect sub-1 MWe systems to the electric grid without imposing unrealistic connection fees or other impediments. Costs and administrative burdens should be reduced to an absolute minimum for these units and fair compensation should be paid for excess electricity sold to the grid.**

## *Article 9*

### **Administrative procedures**

1. Member States or the competent bodies appointed by the Member States shall evaluate the existing legislative and regulatory framework with regard to authorisation procedures or the other procedures laid down in Article 4 of Directive 96/92/EC, which are applicable to cogeneration installations, with a view to:
- (a) encouraging the design of cogeneration installations to match ~~economically justified demands for~~ **useful heat output and avoiding production of more heat than useful heat resulting in fuel savings compared with the separate production of heat and electricity; and avoiding production of more heat than useful heat.**
  - (b) reducing the regulatory and non-regulatory barriers to an increase in cogeneration;
  - (c) streamlining and expediting procedures at the appropriate administrative level; and
  - (d) ensuring that the rules are objective, transparent and non-discriminatory, and take fully into account the particularities of the various cogeneration technologies.
2. Member States shall – where this is appropriate in the context of national legislation – provide an indication of the stage reached specifically in:
- (a) co-ordination between the different administrative bodies as regards deadlines, reception and treatment of applications for authorisations;
  - (b) the drawing up of possible guidelines for the activities referred to in paragraph 1, and the feasibility of a fast-track planning procedure for cogeneration producers; and

- (c) the designation of authorities to act as mediators in disputes between authorities responsible for issuing authorisations and applicants for authorisations.
3. The Commission shall, in the report referred to in Article 11 and on the basis of the Member States' reports referred to in Article 10(1), assess best practices with a view to achieving the objectives referred to in paragraph 1.

#### *Article 10*

#### **Member States' reporting**

1. Member States shall, not later than ~~two years~~ **18 months** after the entry into force of this Directive, publish a report with the following content:
- (a) ~~efficiency reference values for separate production of heat and electricity referred to in Article 5 (2);~~
  - (b) ~~principles for defining the national efficiency reference values for separate production of heat and electricity referred to in Article 5 (2);~~
  - (e)**(a)** analysis of national potential for high efficiency cogeneration referred to in Article 6(1);
  - (d)**(b)** analysis of barriers, which may prevent the realisation of the national potential for high efficiency cogeneration referred to in Article 6(~~3~~**4**);
  - (e)**(c)** examination of the measures taken to facilitate access to the grid system of electricity produced from cogeneration and, inter alia, the feasibility of introducing two-way metering for cogeneration units installed in residential buildings;
  - (f)**(d)** evaluation of the existing legislative and regulatory framework referred to in Article 9(1) and 9(2).
2. Member States shall not later than ~~two years~~ **18 months** after the entry into force of this Directive and hereafter every ~~three~~ **two** years publish a report on progress towards increasing the share of high efficiency cogeneration referred to in Article 6(~~4~~**5**);
3. Member States shall submit to the Commission on an annual basis statistics on national electricity and heat production from cogeneration, in accordance with the methodology shown in Annex II.

They shall also submit annual statistics on cogeneration capacities and fuels used for cogeneration.

## Article 11

### Commission reporting

On the basis of the ~~reports submitted pursuant to Article 8(7) and Article 10 (1) and (3)~~ **above provisions in Article 5 and 10**, the Commission shall review the application of this Directive and submit to the European Parliament and to the Council not later than four years after the entry into force of this Directive and thereafter every six years, a progress report on the implementation of this Directive.

In particular, the report shall:

- ~~(a)~~ ~~consider the scope for further harmonisation of the criteria to determine the efficiency of cogeneration.~~
- ~~(b)~~ **(a)** consider progress towards realising national potentials for high-efficiency cogeneration referred to in Article 6.
- ~~(e)~~ **(b)** assess the extent to which rules and procedures defining the framework conditions for cogeneration in the internal energy market are set on the basis of objective, transparent and non-discriminatory criteria taking due account of the benefits of cogeneration.
- ~~(d)~~ **(c)** examine the experiences gained with the application and coexistence of different support mechanisms for cogeneration.
- ~~(e)~~ **(d)** review reference values for separate production on the basis of the current technologies

If appropriate, the Commission shall submit with the report further proposals to the European Parliament and the Council.

## Article 12

### Transposition

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than two years after the entry into force of this Directive. They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication. The Member States shall lay down the methods of making such reference.

Article 13

Committee

1. The Commission shall be supported by a committee known as the 'cogeneration committee', comprising of representatives of the Member States and chaired by representatives of the Commission.
2. In applying this paragraph, the regulatory procedure pursuant to Article 5 of Decision 1999/468/EC, with particular reference to Article 7 and 8 thereof, shall be used.
3. The Committee shall adopt its own Rules of Procedure.

Article 1314

**Entry into force**

This Directive shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Communities Commission.

Article 1415

**Addressees**

This Directive is addressed to the Member States.

Done at Brussels,

*For the Council  
The President*

## ANNEX I

### **Cogeneration technologies covered by the Directive**

- a) Combined cycle gas turbine with heat recovery
- b) Steam backpressure turbine
- c) ~~S~~**Non-nuclear** steam extraction condensing turbine
- d) Gas turbine with heat recovery
- e) Internal combustion engine
- f) Microturbines
- g) Stirling engines
- h) Fuel cells
- i) Steam engines
- j) Organic Rankine cycles
- k) Any other type of **non-nuclear** technology or combination thereof falling under the definitions laid down in Article 3.

## ANNEX II

### **Definition Calculation of electricity from cogeneration**

Values used for calculation of electricity from cogeneration shall be determined on the basis of the expected or actual operation of the unit under realistic conditions.

~~a) Electricity production from cogeneration shall be considered equal to total annual electricity production of the unit.~~

- ~~• in cogeneration units of type b), d), e), f), g), and h) referred to in Annex I, with an annual overall efficiency higher or equal to 75%, and~~
- ~~• in cogeneration units of type a) and c) referred to in Annex I with an annual overall efficiency higher or equal to 85%.~~

~~ba)~~ Calculations shall be made in order to separate electricity from cogeneration and electricity not produced in a cogeneration process. ~~In cogeneration units with an annual overall efficiency below 75% (cogeneration units of type b), d), e), f), g), and h) referred to in Annex I) or with an annual overall efficiency below 85% (cogeneration units of type a) and c) referred to in Annex I) The following formula shall be used:~~

$$E_{\text{CHP}} = Q_{\text{net}} \cdot C$$

where

$E_{\text{CHP}}$  is the amount of electricity from cogeneration

$C$  is the power to heat ratio

$Q_{\text{net}}$  is the net heat production from a cogeneration process (defined as total heat production minus any heat produced separately, e.g. in separate boilers, peak boilers or as live steam extraction).

**To determine whether electricity counts as electricity from** ~~If the actual power to heat ratio of a cogeneration unit is not known, the following default values may be used for units of type a), b), c), d), and e) referred to in Annex I provided that the calculated cogeneration electricity is less or equal to total electricity production of the unit, where the actual power to heat ratio is not known:~~

Type of the unit	Default power to heat capacity ratio, C	
	District heating	Industrial
Combined cycle gas turbine with heat recovery	0.95	0.75
Steam backpressure turbine	0.45	0.30
Steam condensing extraction turbine	0.45	0.30
Gas turbine with heat recovery	0.55	0.40
Internal combustion engine	0.75	0.60

Subject to prior notification to the Commission, Member States may use other default values for power to heat ratios than the ones provided in this Annex. Such alternative default values shall be published by Member States.

If Member States introduce default values for power to heat ratios for units of type f), g), h), i), j) and k) referred to in Annex I, such default values shall be published and shall be notified to the Commission.

- e)b) Subject to prior approval by the Commission, Member States may use other methods than the one provided for in paragraph b) of this annex to subtract possible electricity production not produced in a cogeneration process from the reported figures.
- c) **If a share of the energy content of the fuel input to the cogeneration process is recovered in chemicals and recycled this share can be subtracted from the fuel input before calculating electricity from cogeneration in Annex II and primary energy savings in Annex III.**
- d) **Member States may prior to approval by the Commission in accordance with the procedure referred to in Article 13.2 use an alternative methodology for calculation of electricity from cogeneration developed by the European Standardisation Organisations CEN and/or CENELEC;**

### ANNEX III

#### **Methodology for determining the efficiency of the cogeneration production process**

Values used for calculation of efficiency of cogeneration production and primary energy savings shall be determined on the basis of the expected or actual operation of the unit under realistic conditions.

##### **a) High-efficiency cogeneration**

For the purpose of this Directive high-efficiency cogeneration production shall fulfil the following criteria:

- production from new cogeneration units shall provide primary energy savings of at least 10% compared with the references for separate production of heat and power;
- production from existing cogeneration units shall provide primary energy savings of at least 5% compared with the references for separate production of heat and power;
- production from cogeneration units using renewable energy sources and from cogeneration installations with an installed capacity below 1 Mwe, **and micro-cogeneration units**, providing primary energy savings in the range 0-5% may qualify as high-efficiency cogeneration;
- Member States may introduce principles whereby production from cogeneration units below the thresholds referred to in this Annex may be considered to be partially fulfilling the efficiency criteria. If such principles are applied, appropriate methodologies for determining the reduced efficiency of such production, calculated in proportion to the reduced primary energy savings, shall be developed by the Member State and shall be notified to the Commission. In such cases, the reduced efficiency of the cogeneration production shall be clearly displayed on the certificate of origin.

##### **b) Calculation of primary energy savings**

The amount of primary energy savings provided by cogeneration production defined in accordance with Annex II to this Directive shall be calculated on the basis of the following formula:

$$PES = \left( 1 - \frac{1}{\frac{CHP H\eta}{Ref H\eta} + \frac{CHP E\eta}{Ref E\eta}} \right) \times 100\%$$

Where:

PES is primary energy savings

CHP H $\eta$  is the heat efficiency of the cogeneration production

Ref H $\eta$  is the heat efficiency of the reference for separate heat production

CHP  $E_{\eta}$  is the electrical efficiency of the cogeneration production

Ref  $E_{\eta}$  is the electrical efficiency of the reference for separate electricity production

Subject to prior notification to the Commission, Member States may use other formula leading to the same results to calculate the primary energy savings from cogeneration. In the cases where alternative formulas are used, such formula shall be published by the Member State.

**In the case of cogeneration units connected to the electricity distribution system, the reference values provided in the above table may be lowered by 5-10% to take account of avoided network losses.**

**c) Efficiency reference values for separate production of heat and electricity**

~~The principles for defining the references for separate production of heat and electricity referred to in Article 5(2) and in the formula set out in paragraph b) of this Annex shall establish the operating efficiency of the separate heat and electricity production that cogeneration is assumed to displace.~~

To define the efficiency reference values **for the transitional period up until the publication of harmonised reference values in the Official Journal of the European Union**, the following principles shall be applied:

1) For new cogeneration units as defined in Article 3, the comparison with new separate electricity production shall be based on the principle that similar fuel categories are compared. The following indicative efficiency reference values for new separate electricity production may be used:

~~Indicative efficiency reference values for new separate electricity production~~

<b>Fuel category</b>	<b>Operating efficiency</b>
Natural gas	55%
Coal	42%
Oil	42%
Renewables and waste	22-35%

~~In the case of cogeneration units connected at the electricity distribution system, the reference values provided in the above table may be lowered with 5-10% to take account of avoided network losses.~~

2) For new cogeneration units as defined in Article 3, the indicative efficiency reference value of new separate heat production shall be an operating efficiency of 90%.

In the case of heat production based on oil or coal, the efficiency reference value ~~may~~ **shall** be lowered to 85%. In the case of heat production based on renewable energy sources or waste, the efficiency reference value ~~may~~ **shall** be lowered to 80%. In the case of high temperature steam used for industrial processes, the reference values for separate heat production ~~may~~ **shall** be lowered to 80%.

- 3) For existing cogeneration units as defined in Article 3, the efficiency reference value for separate electricity production shall be based on the average operating efficiency of the national fossil-fuelled electricity production. Where appropriate, possible cross-border trade in electricity having an impact on the reference values may be taken into account.
- 4) For existing cogeneration units as defined in Article 3 the efficiency reference value for separate heat production shall be based on the average operating efficiency of the national heat production mix.
- 5) Subject to prior notification to the Commission, Member States may include additional aspects in the national criteria for determining the efficiency of cogeneration.

## ANNEX IV

### **Criteria for analysis of national potentials for high-efficiency cogeneration**

- ~~a) The analysis of the national potential for high efficiency cogeneration shall identify suitable heating and/or cooling demands and shall distinguish between application of cogeneration in at least the following main categories:~~
- ~~— Industrial cogeneration~~
  - ~~— Heating cogeneration~~
  - ~~— Agricultural cogeneration~~
- ~~b) For each of the three categories referred to under a), the analysis shall consider:~~
- ~~— The type of fuels that are likely to be used to realise the cogeneration potentials, including specific considerations on the potential for increasing the use of renewable energy sources in the national heat markets via cogeneration.~~
  - ~~— The type of cogeneration technologies as listed in Annex I that are likely to be used to realise the national potential.~~
  - ~~— The type of separate production of heat and electricity that high efficiency cogeneration is likely to substitute.~~
  - ~~— A division of the potential into modernisation of existing capacity and construction of new capacity.~~
- ~~c) The analysis shall include appropriate mechanisms to assess the cost effectiveness in terms of primary energy savings of increasing the share of high efficiency cogeneration in the national energy mix. The analysis of cost effectiveness shall also take into account national commitments accepted in the context of the climate change commitments accepted by the Community pursuant to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.~~
- ~~d) The analysis of the national cogeneration potential shall specify the potentials in relation to the timeframes 2010, 2015 and 2020 and include appropriate cost estimates for each of the timeframes.~~