Discussion paper

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Allocation rules – EU ETS post 2012

Disclaimer

The views expressed in this paper represent only the views of the authors and not those of the European Commission. This discussion paper is intended to stimulate the discussion on allocation rules with Member States and can by no means be regarded as a final document.

1 INTRODUCTION

The aim of this discussion paper is to outline the allocation rules to be applied by Competent Authorities to calculate the final total annual allocation for installations covered by the EU ETS.

The discussion paper has been elaborated by Umweltbundesamt GmbH (Austria) working in close contact with DG Climate Action on these issues. This discussion paper is intended to stimulate the discussion on allocation rules with Member States, to support pilot studies on allocation by Member States, to prepare for the legal text and to invite for contribution of proven best practices from earlier allocation exercises.

2 KEY ELEMENTS OF THE CIMS

The CIMS (transitional Community-wide and fully harmonised implementing measures pursuant to Article 10a(1) of the EU ETS Directive[1]) will provide the necessary elements for the calculation of the final total annual allocation for an individual installation:

- Determination of the eligibility for free allocation as incumbent or new entrant;
- General allocation methods (based on product benchmarks and fall-back approaches) including formulae for the calculation of free allocation for installations;
- Calculation rules and values for the input variables for the general allocation methods;
- Rules for specific product benchmarks;
- Treatment of cross-boundary heat flows.

Furthermore the CIMs will contain some elements concerning administrative details for establishing the NIMs, such as the process of application for free alloca-

[1] Directive 2003/87/EC, most recently amended by Directive 2009/29/EC, making it the so-called “revised EU ETS Directive”.

tion and requirements for the baseline data collection. These elements are described in more detail in the following sections.

3 KEY ELEMENTS OF THE NIMS

3.1 Scope of the EU ETS

The Guidance on interpretation of Annex I of the EU ETS Directive provided by the Commission and endorsed by the Climate Change Committee[2] shall be respected.

3.2 Incumbents and new entrants

It is relevant to identify each installation as "incumbent" or "new entrant", before allocations are calculated. New entrants are not notified to the Commission as part of the NIMs. Therefore the following criteria have to be taken into account.

Incumbents are not defined in the EU ETS Directive. For the purpose of this discussion paper, an incumbent is considered any installation within the scope of the EU ETS, which is not a new entrant (for definition of "new entrant" see section 6.1). An incumbent must meet two criteria:

> Criterion 1: Installations must be carrying out one or more of the activities indicated in Annex I of the EU ETS Directive or an activity opted-in under Article 24 for the first time[3]. For treatment of opt-ins see the annex (section 10.4.1).
>
> Criterion 2: The installation must have obtained a greenhouse gas emissions permit before 30 June 2011.

If the Competent Authority (CA) was not able to issue a greenhouse gas emissions permit before this date, criterion 2 shall be deemed satisfied, if the CA establishes, in particular, that before 30 June 2011 (cumulative conditions):

- the installation concerned was in possession of a valid IPPC or other relevant environmental permit,
- was in fact operating, and
- had fulfilled all other criteria on the basis of which it would have been entitled to receive the greenhouse gas permit under the relevant national legislation,

and could thus be considered as incumbent.

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[2] http://ec.europa.eu/environment/climat/emission/pdf/100318_guidance_interpr_annex_i_final.pdf

[3] The ETS Directive doesn't mention a deadline for this first inclusion by opt-in. For practical reasons, it might be safe to limit the incumbent case to before 30 June 2011.

This exception shall apply notwithstanding the fact that all incumbent installations shall be included in the list to be submitted to the Commission by 30 September 2011 pursuant to Article 11 of the EU ETS Directive and the obligation for the operator concerned to apply for and hold a regular greenhouse gas emissions permit for the trading period starting on 1 January 2013.

More guidance on the distinction of incumbents and new entrants is given in the annex (section 10.2).

3.3 Eligibility for free allocation

The CA will have to assess whether free allocation can be granted.

Installations only producing electricity are not eligible for free allocation, neither are installations for the capture[4] of CO_2, pipelines[5] for transport of CO_2 and CO_2 storage sites[6].

Installations producing heat – whether or not the installation is classified as "electricity generator" – are eligible for free allocation for the amount of heat produced to the extent it is used for purposes listed in the definition of “measurable heat (see section 4.4). For the exact calculation of the free allocation each installation has to be classified either as electricity generator pursuant to Article 3(u) of the revised EU ETS Directive or as non-electricity generator. The Commission’s “Guidance paper to identify electricity generators” of 18 March 2010 is to be used for this purpose.

The eligibility for free allocation pursuant to Article 10c is outside the scope of this discussion paper.

In some cases the CA will come to a final decision only after detailed information such as from the baseline data collection has been provided by the operator of the installation.

3.4 National Implementing Measures

The National Implementation Measures (NIMs) pursuant to Article 11(1) will list all installations to be included in the EU ETS from 2013 onwards, and the preliminary amount of allocation which the installations get for free pursuant to Articles 10a(1) and 10c. The NIMs will include all installations, including also those with zero allocation (e.g. electricity generators without heat production not covered by Article 10c).

Small emitters which a Member State may choose to exclude from the EU ETS pursuant to Article 27 of the EU ETS Directive have to be listed as well. As the Commission may assess and where appropriate reject such exclusions, these

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[4] "CO_2 capture" means the activity of capturing from gas streams CO_2 which would otherwise be emitted, for the purposes of transport and geological storage in a storage site permitted under Directive 2009/31/EC. "Capture installation" means an installation which carries out CO_2 capture.

[5] “Pipeline” can be understood as "transport network" within the meaning of Article 3(22) of Directive 2009/31/EC.

[6] "Storage site" means "storage site" within the meaning of Article 3(3) of Directive 2009/31/EC.

small emitters have to be considered as installations within the EU ETS in this first step. More information on the exclusion of small emitters can be found in the annex (section 10.4.2).

4 ALLOCATION RULES AS PART OF THE CIMS

4.1 General approach

In accordance with Article 10a(1) of the revised EU ETS Directive the allocation free of charge will be based to the extent feasible on community-wide ex-ante benchmarks. Only in case such benchmarks are not feasible, so-called fall-back approaches (heat benchmark allocation method, fuel benchmark allocation method, historical emissions allocation method) will be used. These allocation methods are described in sections 4.6 to 4.9. The principles for the decision on their use are laid down in section 4.4.

In order to use the most appropriate allocation approach, the Member States ensure that each installation is divided into logical "sub-installations" as shown in Figure 1, if more than one benchmarked product is produced in that installation, and/or if more than one fall-back approach is relevant in an installation. Allocations can then be calculated for each sub-installation separately, applying the appropriate allocation methods and carbon leakage exposure factors. The definition of "sub-installations" is furthermore relevant for the application of new entrant rules (definition of installed capacity).

As the final calculation of allocation involves a notification of preliminary data to the Commission in order for the Commission to be able to calculate the uniform cross-sectoral correction factor if found necessary pursuant to Article 10a(5), it is useful to outline here the process and clarify the wording which is used in the following sections:

1. The **basis for calculating the allocation** (the "**annual basis amount**" hereinafter) <u>for each sub-installation</u> is calculated (see section 4.5.1).
2. The basis for calculating the allocation ("the annual basis amount") is calculated <u>for each installation</u> by summing up the sub-installations' basis amounts determined under step 1 (see section 4.5.2).
3. The Member State notifies to the Commission the annual basis amount for each installation.
4. The Commission uses the notified data for assessment of the necessity to apply a uniform cross-sectoral correction factor. If necessary, the Commission calculates this factor.
5. A **preliminary annual total allocation** per installation is calculated, taking into account the relevant carbon leakage exposure factors for each sub-installation (see section 4.5.3).
6. The **final annual total allocation** per installation is calculated by applying the uniform cross-sectoral correction factor (if applicable) to the preliminary total allocation of each installation (see section 4.5.4).

[Further guidance on administrative details of the notification to the Commission may be provided at a later stage.]

4.2 Sub-installations – the Concept

4.2.1 Definition

A sub-installation is defined as a set of parameters defining the system boundaries for

- baseline data reporting and
- application of appropriate allocation rules.

Thus, a sub-installation consists of inputs (fuels and raw materials, but also heat imports[7]), outputs (products and services, exports of heat, waste gases and transferred CO_2), and corresponding emissions. The sub-installation corresponds to the extent feasible to physical parts of the installation (units, production lines). However, this is not an absolute requirement. A physical unit can belong to more than one sub-installation, e.g. a boiler delivering steam to several production lines for different products (with or without a product benchmark). In some cases, there is also a temporal element: Over a period of time a production line may be used for different products, which might belong to different benchmarks or carbon leakage exposure, i.e. to different sub-installations.

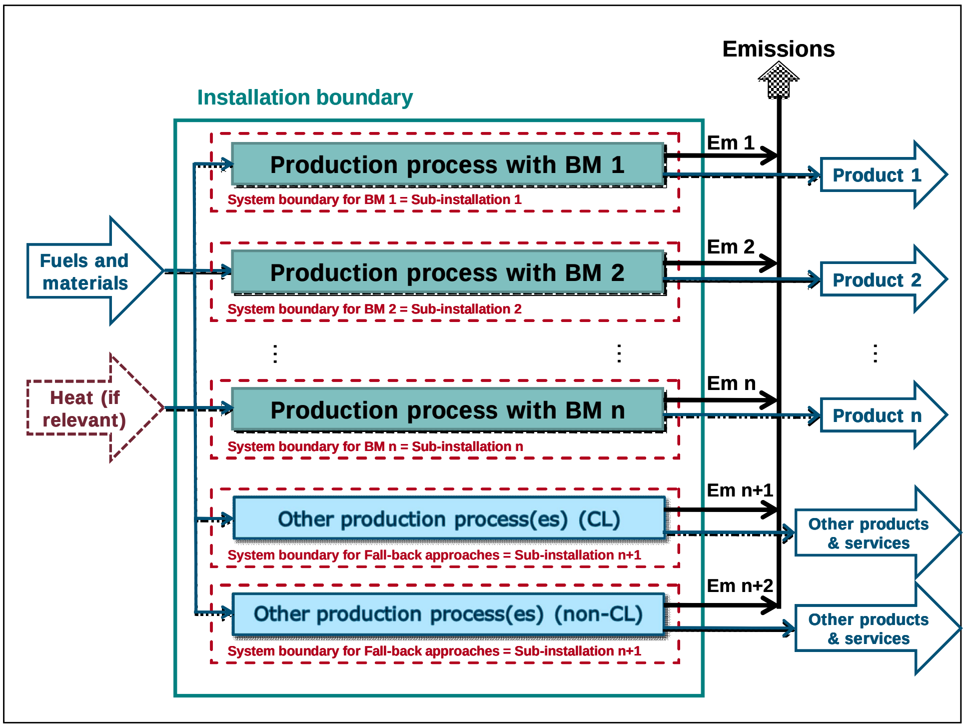

Figure 1: Division of installations into sub-installations by applying system boundaries as used for product benchmarks

[7] In some cases, also electricity consumption is relevant, see section 4.14.1.

Figure 1 shows a simplified scheme of an installation with several sub-installations. An example for dividing installations into sub-installations is presented in section 10.1.

4.2.2 Determination and Boundaries of Sub-installations

In the baseline data collection (see section 8), the operator of an installation shall report activity levels and emissions in the baseline period separately for each sub-installation. Each sub-installation corresponds to either one product benchmark[8] or to one fall-back approach and carbon leakage status.

Where emissions from an installation stem from only one product with a product benchmark or only from products or services covered by a single fall-back approach of the same carbon leakage status, only one sub-installation (identical to the installation) is established.

The boundaries of sub-installations for benchmarked products shall be in accordance with the definitions of system boundaries for product benchmarks as stipulated in the annex (section 9.1).

The sub-installations for “fall-back approaches” cover all emissions which are not inside the boundaries of any product benchmark. There can be up to six different sub-installations for fall-back approaches in an installation, i.e. for each of the three fall-back approaches one sub-installation corresponding to products or services that are exposed to significant risk of carbon leakage, and one for each of the three fall-back approaches one sub-installation corresponding to products or services that are not exposed to significant risk of carbon leakage. Thus, if the installation produces *n* benchmarked products, the maximum number of sub-installations is *n+6*.

Under some circumstances the CA may require the operator of an installation to further disaggregate the reported data into more than the said maximum number of sub-installations. Such circumstances include very complex installations, where additional transparency is needed for applying the allocation rules. Another reason why the CA may require further disaggregation exists if in an installation products with different NACE codes[9] are produced which get allocation under the same fall-back approach. In that case, the CA may decide to require further disaggregation of the data if the carbon leakage exposure status of some of these products is likely to be changed in the next version of the Commission Decision pursuant to Article 10a(13) of the revised EU ETS Directive.

There shall be no overlap between sub-installations, and the emissions of all sub-installations shall add up to a maximum of 100 % of the installation’s emissions[10].

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[8] A product benchmark may correspond to several products, such as e.g. “high value chemicals” from crackers, which correspond to several chemical products at once. In other cases, minor amounts of by-products typical for a sector, e.g. tars from coke ovens will be included in the benchmark.

[9] Different at 4-digits level.

[11] Emissions in the sense of historical activity levels (HAL_i). If the sub-installation uses mainly biomass or heat imported from other (sub-)installations, the emissions are not an appropriate meas-

In order to reduce the administrative burden of all involved actors:

1) a *de-minimis* threshold for emissions[11] related to sub-installations for each of the three "fall-back approaches" is applied: where within one fall-back approach more than 95% of emissions can be attributed to one carbon leakage exposure status, this fall-back approach is not split into two sub-installations, but the carbon leakage exposure status of the majority of emissions is used.

2) a *de-minimis* threshold for emissions related to sub-installations with "fall-back approaches is applied: if the emissions of the sub-installation(s) "fall-back approaches" are less than a *de-minimis* amount of [1-5] % of the installation's total emissions[12], no separate sub-installation for fall-back approaches may be defined, or the operator of the installation may propose to the CA for these emissions to define another "product benchmark" sub-installation for which the product definition of the product benchmark is very close and similar to the product that is produced.

The burden of proof for data completeness and for absence of double counting is on the operator. Where an operator chooses to report less data (e.g. only data related to product benchmarks, while the small amount for fall-back approaches is considered too difficult to determine) or where an operator chooses to propose a "similar" product benchmark sub-installation, the CA will be able to calculate free allocation only to those sub-installations where data is available and duly substantiated.

Detailed rules for attributing data to sub-installations are laid down for the baseline data collection in section 8.7. Specific rules given in section 4.10 for cross-boundary heat flows may also be relevant.

4.3 Allocation methods to be used for sub-installations

Based on the information from the baseline data collection, the CA will know for each relevant installation included in the EU ETS from 2013 onwards, which products it produces, or what other purpose (electricity generation, heat supply, CO_2 storage...) it serves. As outlined in section 4.2, all baseline data has to be assigned to "sub-installations" (representing either product benchmarks or fall-back approaches).

The following hierarchical order in the application of allocation methods shall be used for each sub-installation:

1. Where a product benchmark is available, the annual amount of allowances that is the basis for calculating the allocation to this sub-

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ure for the threshold. In these cases, the energy input to the sub-installation can be used for setting the threshold.

[11] Emissions in the sense of historical activity levels (*HAL_i*). If the sub-installation uses mainly biomass or heat imported from other (sub-)installations, the emissions are not an appropriate measure for the threshold. In these cases, the energy input to the sub-installation can be used for setting the threshold.

installation is calculated in accordance with section 4.6, using the product benchmarks as listed in the annex (section 9.2).

2. For calculating the annual amount of allowances that is the basis for calculating the allocation to each sub-installation in which other processes than those related to the production of the benchmarked products (in accordance with the system boundaries defined in the annex (section 9.1)) are carried out or where no product benchmark is applicable, fall-back approaches are used in the following sequence, with only one fall-back approach attributed to one sub-installation:

    a. The heat benchmark allocation method (see section 4.7) is used for emissions stemming from the production of *measurable heat* to the extent that this heat is consumed for purposes listed in the definition of measurable heat (section 4.4).

    b. For emissions caused by *other fuel combustion* the fuel benchmark allocation method is used (see section 4.8).

    c. All other GHG emissions can be considered *process emissions*. The historical emissions allocation method is applied for these emissions, as outlined in section 4.9.

For installations qualifying as electricity generator the only applicable allocation method is the heat allocation method. Calculating allocations according to section 4.5 to installations qualifying as electricity generator is subject to the provisions referred to in section 3.3 and does not prejudice the application of the rules concerning cross-boundary heat flows (see section 4.10).

4.4 Definitions needed for deciding on the appropriate fall back allocation method

The following definitions shall apply for the purpose of assigning the appropriate fall back allocation method. These definitions apply only to material and energy flows not covered by the system boundaries of any product benchmark[13]:

(1) "Measurable heat" means a heat flow using a heat transfer medium[14] which is transported through identifiable piping or ducts, which makes the amount of heat measurable in principle using the measurement of the flow and the temperature (and pressure) of the medium. All such heat should be consid-

[13] According to the rules of the non-paper "Quality and Verification Criteria for benchmarking data for the EU ETS", no distinction is made for product benchmarks between combustion and process emissions, or between different types of heat.

[14] Steam, hot air or water, oil, liquid metals or salts, brines, refrigerants, inert gases, supercritical fluids, etc. The hot flue gas is usually not considered a heat transfer medium.
An indication for what can be considered measurable is the possibility of installing a heat meter. Such meter is either a complete instrument or a combined instrument consisting of the sub-assemblies, flow sensor, temperature sensor pair, and calculator (cf. Measurement Instruments Directive). Having a duct or piping in which a flow meter can be fit is essential for the measurement of the flow rate of a medium. If there is no defined duct between a burner flame and the location of heat use, such as is the case in several types of kilns, ovens, dryers, furnaces etc., even if there is some distance between the flame and the material to be heated, the flow rate of hot air which acts as transfer medium cannot be measured. Consequently, heating in such direct heating applications cannot be treated as "measurable heat". The same is true when fuels are used in engines or turbines for the generation of mechanical energy (without electricity generation).

ered *measurable*, even if no precise measurement at the moment exists. If no measurement instruments exist, proxy data for the amount of heat has to be derived from the calorific values of the fuel input (see section **8.5.3**). Heat flows shall be net heat flows, i.e. the heat content in the condensate or transfer medium returning to the heat supplier is subtracted. Accountable for allocation is only the amount of heat consumed in production processes, for the production of mechanical energy, for heating or cooling[15], or delivered to external consumers for such consumption purpose. Heat used for the production of electricity shall not be accounted for.

(2) "Other fuel combustion" means fuel consumed by combustion for direct heat production without heat transfer medium or for the production of mechanical energy[16], and excludes fuels used in electricity production[17,18], flaring[19], and cases where the fuel use leads to process emissions (see below).

(3) "Process emissions"[20] means greenhouse gas emissions other than combustion emissions occurring as a result of intentional and unintentional reactions between substances or their transformation, including the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock. Consequently, the following types of emissions can be regarded as process emissions:

1. Non-CO_2 GHG emissions;
2. Emissions from the decomposition of carbonates;
3. Emissions resulting from the use of combustible carbon containing material (i.e. material which can also be considered a fuel), if the operator can demonstrate to the satisfaction of the competent authority that the primary purpose of the use of such material is not energy conversion, but rather the participation in chemical reactions for the production of materials. Such reactions include the reduction of metal ores, the removal of impurities from metals, or organic chemical syntheses where the "fuel" participates in the reaction as material and not for heat input only.

   Where these criteria are satisfied, CO_2 emitted directly is considered as process emission. Where the resulting CO_2 is not emitted directly, but

[15] E.g. in hospitals, office buildings etc. if such installations are within the ETS.

[16] E.g. driving of turbines or engines, e.g. for compressors and pumps.

[17] An exemption may apply for the combustion of waste gases for the purpose of electricity production *[this depends on the methodology for setting certain product benchmarks, which is currently under discussion]*.

[18] The derogation from this principle under Article 10c is not further discussed here, because the allocation methodology under Article 10c has to work independently from the allocation rules pursuant to Article 10a, which are the subject of this discussion paper.

[19] In this case "fuels" includes all gases which are flared. The term "flaring" is commonly used for combustion of highly fluctuating amounts of process or residual gases in a unit which is open to atmospheric disturbances such as wind and precipitation. Post-combustion units and incinerators for process or residual gases are usually smaller, enclosed units, and should not be considered as "flaring".

[20] Identical to the definition of the MRG 2007 (Commission Decision 2007/589/EC), Annex I section 2 point 2(b).

forms part of waste gases as defined below, only the CO_2 content[21] of the waste gas is counted as process emissions, while emissions from the combustion of any incompletely oxidised carbon (carbon monoxide and VOCs) in the waste gases can only be considered process emissions subject to point 4.

4. Emissions from the combustion of non-CO_2 constituents of *waste gases* as defined below resulting from reactions under point 3 are considered as process emissions only if no energy recovery is economically feasible, but where the combustion of the waste gases is necessary due to environmental, health or safety reasons. The same criterion is applicable to other off-gases which need treatment in post-combustion units due to environmental, health or safety reasons.

(4) "Waste gases" mean gases stemming from an incomplete combustion or other chemical reaction in an EU ETS installation, and which comply with the following criteria (cumulative):

- Waste gases are not emitted without further combustion due to a significant content of incompletely oxidised carbon,
- the calorific value of waste gases is high enough for the waste gas to burn without auxiliary fuel input, or to contribute significantly to the total energy input when mixed with fuels of higher calorific value, and
- the waste gas is produced as unintended or undesired by-product of a production process.

Because of the last criterion, synthesis gas for (petro-)chemical use as well as products from gasification and pyrolysis, which are integral part of an electricity production process (such as IGCC[22]) do not fall under the definition of "waste gases".

"Non-eligible emissions" mean all greenhouse gas emissions which neither occur within the system boundaries of any product benchmark, nor result from the production of measurable heat or from other fuel combustion, and which are not process emissions. Thus, non-eligible emissions correspond especially to the amount of emissions from flaring *[under assessment if further definition is needed]*, from electricity production, and from installations for the capture of CO_2, pipelines for transport of CO_2 and CO_2 storage sites. The definition serves for the purpose of making a complete emissions balance for an installation:

Total emissions of an installation =
= emissions as part of product benchmarks
+ emissions from the production of measurable heat
+ emissions from other fuel combustion
+ process emissions
+ non-eligible emissions.

[21] When collecting baseline data for the reference period, measured data of the composition of the waste gases will often be unavailable. In that case the best available estimate for the composition of the waste gas based on average process parameters has to be used.

[22] Integrated Gasification Combined Cycle

4.5 Calculating the annual amount of free allocation to installations

4.5.1 Calculating the basis for allocation of free allowances to sub-installations

The annual amount of allowances that is the **basis for calculating the allocation** (hereinafter the "**annual basis amount**") to installations is calculated using the following procedure:

For each year from 2013 onwards and <u>for each sub-installation</u> the annual basis amount is calculated:

1. For sub-installations correlating to a product benchmark, the annual basis amount is calculated pursuant to section 4.6 (Method A);
2. For sub-installations correlating to a fall-back approach, the annual basis amount is calculated pursuant to one of the sections 4.7 to 4.9 (Methods B to D) as appropriate;

The carbon leakage exposure factor (see par. 4.13) for each sub-installation is not taken into account in this calculation.

4.5.2 Calculating the basis for allocation of free allowances at installation level

The annual basis amount <u>for each installation</u> is calculated for each year *k* from 2013 onwards by summing up all sub-installations' calculated annual basis amounts. If any resulting annual basis amount for an installation has a negative value after that calculation, it is set to zero.

$$F_{basis\ amount}^{installation}(k) = \sum_i F_{basis\ amount}^{sub-inst.i}(k)$$

Equation 1

The Member State notifies the annual basis values for each installation to the Commission [as part of the NIMs].

4.5.3 Calculating the preliminary total annual allocation for installations

A preliminary total allocation per installation is calculated in a similar manner as the installation's basis amount, but here the relevant carbon leakage exposure factors of each sub-installation are taken into account.

$$F_{preliminary\ total}^{installation}(k) = \sum_i \left(F_{basis\ amount}^{sub-inst.\,i}(k) \cdot EF_{i,k}\right)$$

Equation 2

4.5.4 Final total annual allocation for installations

In order to determine the final total annual allocation for installations, the preliminary total allocation per installation (see section 4.5.3) is multiplied with the level of the uniform cross-sectoral correction factor for each year *k*.

$$F_{final\ total}^{installation}(k) = F_{preliminary\ total}^{installation}(k) \cdot CCF_k$$

Equation 3

The uniform cross-sectoral correction factor CCF_k for each year k is determined pursuant to Article 10a(5) of the revised EU ETS Directive. If according to that Article no uniform cross-sectoral correction factor is necessary, CCF_k equals 1.

For installations identified as electricity generator in the sense of Article 3(u) of the revised ETS Directive, CCF_k is always 1, since such installations are not subject to the application of the CCF.

The level of CFF_k to be applied to installations not qualifying as electricity generator will only be determined by the Commission according to Article 10a(5) of the revised ETS Directive once all notifications on all annual amounts of allowances that are the basis for calculating allocations to installations have been received by the Commission.

4.5.5 Rounding issues

For every calculation mentioned in sections 4.5.1 to 4.5.4, 4.6 to 4.9 and 4.14, the calculated number of allowances in each year is rounded to whole EUAs. For historic activity levels, all significant digits[23] are used. Linear factor, uniform cross-sectoral correction factor, carbon leakage exposure factor etc. are used with 4 decimal places as noted down in the relevant sections of these draft allocation rules.

4.6 Allocation method for sub-installations producing specific products with a product benchmark (method A)

For each benchmarked product *i*, the annual basis amount for a sub-installation is calculated for each year *k* as follows:

$$F_{P,basis}(k) = BM_{i,k} \cdot HAL_{p,i}$$

Equation 4

With:

$F_{P,basis}(k)$: annual basis amount for year *k* for a sub-installation based on a product benchmark (expressed as EUAs).

$BM_{i,k}$: benchmark for product *i* in year *k* (expressed as EUAs / unit of product). The values of $BM_{i,k}$ can be found in the annex (9.2).

$HAL_{p,i}$: historical activity level: historical production of product *i* (i.e. the median annual production in the baseline period as determined and verified in the baseline data collection, expressed as units of product, as defined in the annex (section 9.1) based on the relevant sector rule book).

Specific rules for some more complex product benchmarks are discussed in section 4.14.

[23] For an explanation of the concept of significant digits see e.g. http://en.wikipedia.org/wiki/Significant_digit

4.7 Heat benchmark allocation method (method B)

For consumption of measurable heat as defined in section 4.4, which is not within the system boundaries of a product benchmark, the annual basis amount based on the heat benchmark for a sub-installation *i* is calculated for each year *k* as follows:

$$\boxed{F_{H,basis}(k) = BM_{H,k} \cdot HAL_{H,i}} \qquad \text{Equation 5}$$

with:

$F_{H,basis}(k)$: annual basis amount for year *k* for sub-installation *i* based on the heat benchmark (expressed as EUAs).

$BM_{H,k}$: heat benchmark in year *k*. The value of $BM_{H,k}$ is set at [*to be added later*] (expressed as EUAs / TJ).

$HAL_{H,i}$: historical activity level: historical measurable net heat consumption of sub-installation *i,* i.e. the median annual measurable net heat consumption in the baseline period as determined and verified in the baseline data collection (expressed as TJ).

Measurable heat exported to installations outside the EU ETS and to district heating networks shall be treated as if it were consumed inside the installation which produces that heat[24]. Measurable heat exported to installations covered by the EU ETS does not receive free allocation in order to avoid double counting of that heat.

Subject to the rules on cross-boundary heat flows laid down in section4.10, if the installation to which allocation is granted using the heat benchmark allocation method has been identified as electricity generator as defined by Article 3(u) of the revised EU ETS Directive, the annual basis amount for each year *k* is calculated as

$$\boxed{F_{H,basis}(k) = BM_{H,k} \cdot HAL_{H,i} \cdot LF_k} \qquad \text{Equation 6}$$

with

LF_k: Linear reduction factor [referred to in Article 9 of the revised EU ETS Directive] for year *k*. The value of LF_k for year *k* is set at *[to be added later*] (expressed without dimension).

4.8 Fuel benchmark allocation method (method C)

For other fuel combustion as defined in section 4.4, the annual basis amount based on the fuel benchmark for a sub-installation *i* is calculated for each year *k* as follows:

$$\boxed{F_{F,basis}(k) = BM_{F,k} \cdot HAL_{F,i}} \qquad \text{Equation 7}$$

with:

[24] By that approach, the producer of the heat receives the allocation, which is an exception to the general rule.

$F_{F,basis}(k)$: annual basis amount for year *k* for sub-installation *i* based on the fuel benchmark (expressed as EUAs).

$BM_{F,k}$: fuel benchmark in year *k*. The value of $BM_{F,k}$ is set at [*to be added later*] (expressed as EUA/TJ).

$HAL_{F,i}$: historical activity level: historical consumption of fuels of sub-installation *i* used for other fuel combustion as defined in section 4.4 (i.e. the median fuel consumption in the baseline period as determined and verified in the baseline data collection, expressed as TJ). Net calorific values (NCV) are used for calculating the fuel input.

4.9 Historical Emissions allocation method (method D)

The annual basis amount for a sub-installation *i* based on the historical emissions allocation method is calculated for each year *k* as follows:

$$F_{E,basis}(k) = PRF_k \cdot HAL_{E,i} \quad \text{Equation 8}$$

with:

$F_{E,basis}(k)$: annual basis amount for year *k* for sub-installation *i* based on the historical emissions allocation method (expressed as EUAs).

PRF_k: Proportionate reduction factor for year *k*. The value of PRF_k for year *k* is set at *[to be added later*] (expressed without dimension).

$HAL_{E,i}$: historical activity level: historical "process emissions"[25] of sub-installation *i* as defined in section 4.4. The median historical process emissions in the baseline period are used as determined and verified in the baseline data collection (expressed as t CO_2(e)).

4.10 Cross-boundary heat flows

[This section is subject to further discussion – a separate discussion note on treatment of cross-boundary heat flows including 1) a further discussion of method 1, 2b(modified) or others and 2) rules for treatment of more complex situations like n:m relationships, i.e. n producers and m consumers will be distributed later.]

4.10.1 General aspects

Cross-boundary heat flows in the context of determining and applying the Community-wide allocation rules in the EU ETS are defined as measurable heat flows between one or more producers of heat covered by the EU ETS supplying the produced heat to one or more consumers of heat covered by the EU ETS.

The standard situation is that all the heat produced by the 'one or more producers of heat covered by the EU ETS' is consumed by 'one or more consumers of

[25] For the definition of „process emissions" see section4.3.

heat covered by the EU ETS'. However, also situations occur where – besides delivering the heat to ETS consumers – part of the produced heat is delivered to non-ETS consumers.

The following situations are not considered as cross-boundary heat flows:

1. Heat flows where the heat producing installation is in the EU ETS and all the heat is consumed by non-ETS installations, for example: a heat producing installation (e.g. district heating installation) delivering its heat to private households using a district heating network, or to one or more consumers having installed less than 20 MW thermal input, nor performing another activity listed in Annex I to the EU ETS Directive.

   This does not pose a methodological challenge as the applicable allocation method for the heat producing installation is the heat benchmark allocation method, whereby – as mentioned in section 4.7 – the measurable heat exported shall be treated as if it were consumed inside the installation. The exposure factor for non-carbon leakage exposed sectors (80…30%) referred to in section 4.12 is used as default, unless the operator provides evidence to the satisfaction of the CA that one or more of the consumers of the heat are exposed to a significant risk of carbon leakage. In the latter case the heat producing installation needs to be divided into two sub-installations with regard to measurable heat.

2. Heat flows where the heat producing installation is not in the EU ETS (e.g. an installation for the incineration of municipal waste) and (partly or all) heat is consumed by an ETS-installation[26].

   This poses a methodological challenge, but could be addressed by subtracting a certain amount of allowances from the initial allocation to the heat consumer, if regarded as necessary *[subject to further discussion]*.

3. Heat flows exchanged between sub-installations within the same installation (i.e. covered by one single GHG emissions permit).

   Regardless the necessity to define in detail the sub-installations in case of different allocation methods to be applied to the installation, this does not pose a methodological challenge, as the installation as a whole is considered.

4.10.2 Calculating and allocation allowances in case of cross-boundary heat flows

The calculation of free allocation is based on one of the allocation methods (product benchmark or heat benchmark allocation method) applied to data of the heat consumer. As a basic principle, the allocation is given to the heat consumer. The heat producer does not receive free allowances for the heat delivered to the consumers[27], unless also heat is delivered to non-ETS consumers. The allocation method laid down in section 4.7 in its current wording does not

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[26] This is rather an exception than a frequently occurring situation.

[27] This method is called "(simplified) method 1" as outlined in principle in the study "Methodology for the free allocation of emission allowances in the EU ETS post 2012.", Ecofys, Fraunhofer ISI and Öko-Institut 2009. Download under http://ec.europa.eu/environment/climat/emission/pdf/bm/BM%20study%20-%20%20Project%20Approach%20and%20general%20issues.pdf

need any further corrections for complying with the general method laid down within this chapter, if the cross-boundary heat flow involves only one producer and only one consumer of heat (with district heating considered as one consumer).

In case of the standard situation outlined above, and in case of 'simple' cross-boundary heat flows (a limited number of heat producer(s) under the ETS delivering heat to a limited number of heat consumer(s) under the ETS), only data from the heat consumer(s) are needed:

a. If a heat consumer is only covered by a product benchmark (i.e. only 1 sub-installation), the allocation is based on 'production data' from the heat consumer only. The exposure factor of the heat consumer is relevant. The calculated allowances are allocated to the heat consumer(s);

b. If a heat consumer is covered by more than one allocation method (i.e. 2 or more sub-installations), the allocation is based on production data and heat consumption data from the heat consumer only. The exposure factors of the sub-installations are relevant. The calculated allowances are allocated to the heat consumer(s).

A requirement for those connected installations to file joint applications for free allocation are encouraged. If no joint application is made, at least all connected installations have to be identified and notified to the CA. Data from the heat producer are needed so that cross-checks by the CA are possible (especially for avoiding gaps or double counting).

In the non-standardised situation (where the heat producer under the ETS not only delivers its heat to heat consumers under ETS, but also delivers heat to non-ETS installations), it is mandatory that also the data of heat production is reported. For the amount of heat consumed by non-ETS installations or other heat consumers outside the EU ETS, the heat producing installation will receive free allocation. The allocation method applied will be the heat allocation method, where the "relevant" historical heat refers to all heat delivered to non-ETS consumers. The exposure factor for non-carbon leakage exposed sectors (80…30%) referred to in section 4.12 is used as default for this amount of heat, unless the operator provides evidence to the satisfaction of the CA that one or more of the non-ETS consumers of the heat are exposed to a significant risk of carbon leakage. In the latter case the heat producing installation needs to be divided into two sub-installations regarding measurable heat. These allowances are then allocated to the heat producer.

In all cases of cross-boundary heat transfer it is the CA’s obligation to ensure that no double allocation occurs, and that the allocation to each individual installation is not less than zero.

4.11 Historical activity levels

4.11.1 General rule

The baseline period to calculate HAL_i is defined as the period from 1 January 2005 to 31 December 2010. The baseline data collection (section 8) will therefore cover all calendar years from 2005 to 2010.

Wherever reference is made in this paper to “historical activity levels” (HAL), the *median* value of the annual activity levels at sub-installation level of these baseline years is meant.

4.11.2 Specific rule 1: Years in which the installation has not been operating

Years in which the installation has not been operating (either because the installation only started up operations during the baseline period[28], or because the installation was completely shut down for at least one full year during the baseline period[29]) are not taken into account for calculation of the median value of the annual activity levels at sub-installation level, except if the installation is classified as seasonal or peak load plant, see section 7.1.

If after application of specific rule 1 to installations that only started operations during the baseline period, the years to be taken into account for the calculation of the HAL_i is less than three years, the initial installed capacity of the installation multiplied with a SCUF *[to be determined]* can be taken into account to calculate HAL_i:

The HAL_i is in this case calculated as follows:

$$\boxed{HAL_i = PC_i \cdot SCUF_i} \qquad \text{Equation 9}$$

With:

HAL_i: Historical activity levels to be used for sub-installation *i*. For product benchmarks, HAL_i is expressed in the unit defined in the annex (section 9.1) for the production level for the relevant benchmark produced per year. For the heat benchmark and fuel benchmark, HAL_i is expressed as TJ per year. For the historical emissions allocation method, HAL_i is expressed as t CO_2(e) per year.

PC_i: Installed production capacity (as defined in section 4.12) of sub-installation *i* at the time of start of operations, expressed in the same unit as HAL_i.

$SCUF_i$: Standard Capacity Utilisation Factor for allocation method *i*, expressed as fraction. For determination of $SCUF_i$ see section 9.3.

The application of this specific rule 1 does not exempt the operator from submitting to the CA all relevant historical activity levels during the whole period 2005 to 2010.

[28] E.g. the installation only started up operations on 1 January 2007.

[29] E.g. the installation was in operation in the years 2005, 2006, 2008, 2010 but did not operate at all during the years 2007 and 2009.

4.11.3 Specific rule 2: Significant capacity increases or reductions between 1 January 2005 and 30 June 2011

When significant capacity increases or reductions have taken place at an installation between 1 January 2005 and 30 June 2011, the HAL_i to be taken into account is calculated as the sum of:

1. the HAL_i as determined based on historical data from the baseline data collection throughout the whole baseline period for the whole installation except for the additional or reduced capacity.
2. The $HAL_{i,added\ /\ reduced\ capacity}$ calculated as follows:

$$\boxed{HAL_{i,added\,/\,reduced\ capacity} = PC_{i,added\,/\,reduced} \cdot SCUF_i} \qquad \text{Equation 10}$$

With:

$HAL_{i,added\ /\ reduced\ capacity}$: Historical activity levels for the added/reduced capacity of sub-installation *i*. For product benchmarks, HAL_i is expressed in the unit defined in the annex (section **9.1**) for the production level for the relevant benchmark produced per year. For the heat benchmark and fuel benchmark, HAL_i is expressed as TJ per year. For the historical emissions allocation method, HAL_i is expressed as t CO_2(e) per year.

$PC_{i,added/reduced}$: Added or reduced production capacity (defined as the difference between installed capacity defined in section 4.12.3 before and after the significant change) of sub-installation *i,* expressed in the same unit as HAL_i.

$SCUF_i$: Standard Capacity Utilisation Factor for allocation method *i*, expressed as fraction. For determination of $SCUF_i$ see section **9.3**.

The “added capacity” is the difference of the capacities approved by the CA before and after the significant capacity increase or reduction. In case of reductions, the value of $PC_{i,added/reduced}$ is negative. If as a consequence the overall allocation to the sub-installation would be negative, the overall allocation to that sub-installation is set to zero.

For providing evidence of the significant capacity increase or reduction, the application of this specific rule does not exempt the operator from submitting to the CA all relevant historical activity levels during the whole period 2005 to 2010.

4.11.4 Specific rule 3: Missing data in the baseline period

If an installation does not report baseline data or if the baseline data has been not or negatively verified, the CA cannot calculate any amount of allowances to be allocated for free[30]. However, if the operator of an installation can demon-

[30] In order to resolve disagreements between operator and verifier, especially in cases of negative verification, the CA will usually give the operator appropriate possibility to explain the reasons for the negative verification result. If in the course of the following communication all material errors, omissions and misrepresentations can be corrected or replaced by conservative substitute data, the normal allocation process can proceed. However, such conflict resolution mechanism cannot replace verification by an independent and competent third party verifier.

strate to the satisfaction of the CA that material data gaps as a result of circumstances beyond the control of the operator of the installation have led to the lack of verifiability, the CA may grant free allocation. This free allocation is calculated using the general methods for all the sub-installations without data-gaps, and by applying specific rule 2 for the sub-installations in which the data gaps occur.

Circumstances beyond the control of the operator include especially cases of *force majeure*, such as outlined in COM(2003) 830 final[31]. The existence of force majeure requires exceptional and unforeseeable circumstances, which could not have been avoided even if all due care had been exercised. That includes "*notably natural disasters, war, threats of war, terrorist acts, revolution, riot, sabotage or acts of vandalism*".

Rules are found in section 8.8 for treating minor data gaps which do not lead to negative verification, because they can be filled using suitable substitution data. Rules on verification of baseline data are developed under section 8.10.

4.12 Installed capacity

4.12.1 General considerations

"Capacity" means the annual activity level resulting if the sub-installation under consideration is operated at full nominal load for 8760 hours per year (i.e. 365×24h).

Because of the influence on calculating the allocation, "capacity" has to be determined at the level of each sub-installation separately, expressing it using the same unit as the related allocation method, i.e.:

- For sub-installations with product benchmark, capacity is measured in the unit which is defined for the product in the annex (section 9.1), e.g. tonnes of dry net product per year, CWT per year,...
- For sub-installations with heat benchmark, the capacity is expressed as TJ measurable heat consumed per year.
- For sub-installations with a fuel benchmark, the capacity is expressed as TJ fuel input per year.
- For sub-installations with historical emissions allocation method, the capacity is expressed as t CO_2(e) emitted per year.

The installed (added/reduced) capacity of an installation is needed in order to

- determine whether an installation would fall under the definition of significant extension or reduction of capacity (for selection of rules for determining baseline data, see section 4.11.3);

[31] Communication from the Commission on guidance to assist Member States in the implementation of the criteria listed in Annex III to Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, and on the circumstances under which force majeure is demonstrated.

- calculate the allocation for incumbents if specific rule 2 (section 4.11.3) is applied;
- calculate the allocation for new entrants (section 6.2) or for significant reductions of capacity (section 7.3).

This requires that the initial installed capacity is known and approved by the CA before any capacity extensions or reductions are made by the operator. After the change, the new installed capacity is to be approved before the allocation levels can be calculated.

The "added capacity" referred to in the sections on calculating substitute data for historic activity levels is defined as the difference between the installed capacities [of a sub-installation] approved by the CA after and before the "significant extension of capacity".

The "reduced capacity" referred to in the sections on calculating substitute data for historic activity levels is defined as the difference between the installed capacities [of a sub-installation] approved by the CA after and before the "significant reduction of capacity". The value of "reduced capacity" is always negative.

4.12.2 Initial installed capacity

The "initial installed capacity" is the capacity determined for the purpose of application of the CIMs before a significant extension or reduction of capacity becomes relevant for allocation of allowances for the period from 2013 onwards.

When the initial installed capacity of an installation is determined for the first time, it is one of the following:

(1) For "normal incumbents" the initial installed capacity is the installed capacity determined at the reference date which the Member State has set for the NIMs notified to the Commission (i.e. a date in proximity to 30 September 2011). "Normal incumbents" are installations which have been in operation on the Member State's reference date (i.e. their "starting date of normal operation" is before the reference date), and which have had no significant extension or reduction of capacity between the start of the baseline period and the reference date. The start of the baseline period is 1 January 2005, the date of exceeding the relevant capacity for inclusion in the EU ETS[32] or the "starting date of normal operation" as defined in section 6.2.2, whichever is the latest.

(2) For other incumbents the initial installed capacity is the capacity before the first significant extension or reduction of capacity occurs which is relevant for adapting the historical activity levels pursuant to section 4.11.3.

(3) For new entrants (completely new installations or installations exceeding the relevant capacity for inclusion in the EU ETS for the first time) the initial installed capacity is the capacity at the "starting date of normal

[32] This criterion shall be applied using the scope of the revised EU ETS Directive (taking into account the relevant Commission guidance), no matter if the installation under consideration has been included in the EU ETS before 2013 or not.

operation" or the date for inclusion in the EU ETS, whichever date is later.

(4) For new entrants (significant extensions of capacity) and for significant reductions of capacity after notification of the NIMs to the Commission, the initial installed capacity is the capacity before the significant extension or reduction of capacity.

The "initial installed capacity" shall be recorded by the CA in a suitable formal manner. If this is done by inclusion in a permit (GHG emissions permit, IPPC or other relevant environmental permit,…) it must be clearly identified as "capacity for the purpose of calculating allocation pursuant to the CIMs", as it might deviate from the capacity laid down in other permits due to the different purpose and method for determination of that capacity. The reference date on which the capacity has been determined, the sub-installation to which it refers, and all other relevant information used for determination of the capacity have to be documented transparently together with the recording of the capacity.

After each capacity change which has been proven to be a "significant extension of capacity" (section 6.1.2) or a "significant reduction of capacity" (section 7.3) and which has therefore led to a change of allocation to the installation, the capacity is determined and formally recorded after that change again. This new capacity shall then be regarded the "initial installed capacity" for any later significant extension or reduction of capacity.

4.12.3 Determination of the installed capacity

In order to determine the installed capacity of an installation and each sub-installation, available information shall be used, applying the following merit order:

1. The maximum annual activity level which is achieved with the current configuration of the installation is determined using the "standard method" as outlined in section 4.12.4.

2. Installed production capacity as stated in the relevant permit. Where the Member State's legislation does not require the capacity to be included in the GHG emissions permit, other relevant permits (IPPC or other environmental permit, general operating permit,...) shall be used, to the extent that he relevant disaggregation of sub-installations is possible from that permit.

3. Where no information from a permit is available, the nameplate capacity as provided by the manufacturer of the (sub-)installation is to be used.

4. If the previous steps are not feasible or if their result is not representative for the existing installation or for the way in which it is normally operated, experimental verification of capacity is to be used (see 4.12.5).

4.12.4 Standard method for determination of capacity

The capacity is defined as the maximum annual activity level which is achievable if it is operated at full load for 365 days a year at 24h per day. Thus, a good measure for this is to determine the maximum possible daily production with the current configuration of the installation, and to multiply this figure with 365 days per year.

In order to make best use of already existing data, especially for the first determination of the “initial installed capacity” when setting up the NIMs, the maximum possible daily production of each sub-installation is determined from the installation’s production protocols as follows:

- The “capacity reference period” is defined as the time between the “capacity starting date” and the “capacity end date”.
  - The “capacity starting date” is the first date from which onwards the physical configuration and way of operation of the installation is comparable to the situation for which the capacity is to be determined. It is the start of the baseline period as defined in section 4.11.1, the first day on which the threshold for inclusion in the EU ETS is exceeded, or the “starting date of normal operation” of the most recent significant extension or reduction of capacity, whichever date is the latest.
  - The “capacity end date” is the day before the date on which the capacity is determined, or the last day before construction or maintenance is started in order to achieve a significant extension or reduction of capacity, whichever is the earlier date.
  - If setting the capacity reference period requires such clarification, e.g. because a longer time period for construction works or major maintenance activities are needed for achieving a significant extension or reduction of capacity, the operator shall seek approval of the capacity reference period by the competent authority.
- The maximum possible daily production is determined as the average of the [10] highest daily activity levels in the “capacity reference period”. If no suitable daily production data exists (especially for sub-installations corresponding to fall-back approaches), the average of the [5] highest weekly activity levels may be used. In this case the CA has to ensure that also for all future determinations of capacity weekly values will be used.

If neither daily nor weekly activity data can be determined from production protocols, the “standard method” is not applicable. The other methods mentioned in section 4.12.3 are to be used instead.

4.12.5 Experimental verification of installed capacity

For determining the installed capacity of an installation and/or sub-installation, a defined real-life test is performed for 24 hours under the supervision of the CA (and/or an accredited verifier). The resulting activity level of 24h is then multiplied with 365 in order to give the annual capacity. All relevant parameters of the test like its duration, the exact product type, and the setting of relevant process variables are to be defined before the test and agreed between the CA and the operator. An independent and competent expert for the industry sector shall be consulted where necessary in order to ensure that the agreed parameters are typical for the sector and will lead to a representative result. Test parameters need to be documented at a level of detail sufficient to allow the installation's personnel to run the test without further instructions for at least 24 hours.

The result of the test shall be approved by the CA and be either included in the GHG emissions permit, or stated in another appropriate form of written opinion by the CA. The agreed test parameters have to be documented as annex to the same document and have to be consistently used for all subsequent tests for that installation if significant capacity changes need verification.

<u>Examples for relevant parameters to be defined:</u>

1. A paper machine can usually produce various paper grades (differences in area weight, colour, coating,...). Each grade can be produced by different process parameters, like e.g. different combinations of processing speed and drying temperature. However, an installation usually develops an optimal or preferred "recipe" for each grade based on experience. Where this experience is not available yet, the manufacturer of the machine can make proposals.

2. For the production of mixed granulated fertilizers, various mixtures of different raw materials can lead to the same nutrient content (i.e. the same saleable product). Some components lead to better (i.e. faster) growth of the granules and a lower internal recycling rate than others. Thus, the amount to be treated in the dryer (which is a potential bottleneck) and the energy consumption will be lower, and the possible production rate will be higher than with other mixing ratios.

In both examples, different product grades will lead to different production capacity results, and also process parameters applied to one product grade have an influence. Thus, minimum definition requirements for capacity tests would be the product itself, which should be the most typical grade (i.e. the most frequently produced grade), and a complete (i.e. sufficient for personnel's understanding) set of production parameters usually applied for that grade, which often refers to the most economic "recipe" which does not lead to practical problems when running the installation. Such "recipe" takes into account environmental permit aspects as well as safety instructions and the personnel's experience how to avoid production failures.

4.13 Carbon leakage exposure factor

The preliminary total free allocation for installations in year *k* is calculated pursuant to section 4.5.3 by summing up all the installation's sub-installations' basic amounts for year *k* multiplied with the carbon leakage exposure factor $EF_{i,k}$ of each sub-installation *i*.

Absolute values[33] for $EF_{i,k}$ are given in Table 1.

[33] Pursuant to Articles 10a(11) and (12) EF is either 100% for sectors exposed to a significant risk of carbon leakage, or 80% in 2013 going down to 30% in 2020 if not exposed to such risk. The values of $EF_{i,k}$ in the non-CL exposed case for each year *k* (from 2013 up to 2020) are calculated as: $EF_{i,k} = 0.5/7 * (2020 - k) + 0.3$

Table 1: Absolute values for the carbon leakage exposure factor $EF_{i,k}$ for sectors deemed and not deemed to be exposed to a significant risk of carbon leakage

Year *k*	2013	2014	2015	2016
EF for significant CL risk	1.0000	1.0000	1.0000	1.0000
EF for no significant CL risk	0.8000	0.7286	0.6571	0.5857
Year *k*	**2017**	**2018**	**2019**	**2020**
EF for significant CL risk	1.0000	1.0000	1.0000	1.0000
EF for no significant CL risk	0.5143	0.4429	0.3714	0.3000

Pursuant to Article 10a(13) of the revised EU ETS Directive the Commission has established a list[34] of sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage that is applicable for the years 2013 and 2014. During the calculation of the NIMs it should be assumed for calculation reasons that this list of sectors and sub-sectors also applies for the years 2015-2020.

If the Commission Decision 2010/2/EU is revised, the final annual amount of free allowances to each installation as calculated pursuant to section 4.5 in each year following the publication of the Commission Decision is adjusted to reflect the change in the list.

Subject to future revisions of the Commission Decision, all sectors or subsectors not found on this list shall be considered not to be at significant risk of carbon leakage. The Commission's list uses the 4-digit codes based on NACE revision 1.1, and for a few sub-sectors 6 or 8-digit PRODCOM 2004 codes.

The annex (sections 9.1 and 9.2) of this discussion paper lists all product benchmarks together with their carbon leakage status according to Decision 2010/2/EU.

For all products and services covered by fall-back approaches rather than product benchmarks, the operator of the installation has to identify the appropriate NACE and/or PRODCOM codes when determining the boundaries of the sub-installations to be reported for the baseline data collection. For this purpose, NACE 1.1 and PRODCOM 2004 shall be used. The first 4 digits of the PRODCOM code (or where appropriate, 6 or 8 digits) corresponds to the codes used in the Commission's list.

The direct use of NACE instead of PRODCOM can only be justified where many different products (corresponding to more than 10 different PRODCOM codes) falling within the same 4-digit NACE code are produced, or where services other than manufacture of goods are performed. All production processes in (sub-)sectors deemed to be exposed to a significant risk of carbon leakage will be treated as one sub-installation 'fall-back approaches for exposed products'. All other production processes will be treated as one sub-installation 'fall-back approaches for non-exposed products'.

[34] Commission Decision 2010/2/EU of 24 December 2009 determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage. Download at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32010D0002:EN:NOT

If during the baseline data collection an operator fails to submit verified NACE/PRODCOM codes, or fails to provide information on the carbon leakage exposure status a sub-installation, the CA will treat that sub-installation as not exposed to carbon leakage.

4.14 Rules for specific product benchmarks

4.14.1 Exchangeability of fuel and electricity

In special cases where heat or mechanical energy produced from fuels is exchangeable for heat or mechanical energy from electricity, product benchmarks are based on total emissions (including indirect emissions from electricity use in the process to which the benchmark relates). In these cases the preliminary free allocation for sub-installation (product) *i* in year *k* is calculated as follows:

$$F_{P,basis}(k) = \frac{Em_{dir}}{Em_{dir} + Em_{indir}} BM_{i,k} \cdot HAL_i \qquad \text{Equation 11}$$

$F_{P,basis}(k)$: annual basis amount for product *i* for year *k* for a sub-installation with exchangeability of heat to electricity (expressed as EUAs).

Em_{dir}: historical direct emissions for production of product *i* (i.e. the median annual direct emissions in the baseline period as determined and verified in the baseline data collection and attributed to the sub-installation under consideration) (expressed as t CO_2(e)).

Em_{indir}: historical indirect emissions for production of product *i* (historical electricity consumption for production for product *i* times 0.465 t CO_2/MWh) (expressed as t CO_2(e)). "Historical electricity consumption" is the median annual electricity consumption (expressed as MWh) in the baseline period attributable to the sub-installation under consideration, unless otherwise specified in the system boundaries of the product benchmark.

This approach is used only for product benchmarks clearly identified in the annex (section 9.1).

4.14.2 CO_2 used as a feedstock

[This section is subject to discussion. The approach presented here is in line with the current proposal for MRG for Ammonia production, which is also under discussion.]

In the chemical industry carbon introduced in a production process in the form of fuels or other carbon containing process inputs is sometimes not completely emitted to the atmosphere as CO_2, but stored in the manufactured end-product.

If this end-product is chemically stable (also when used for its intended purpose), it can be considered as long-lived. Thus, the CO_2 can be considered permanently stored. Emissions from the application of such carbon containing products are accounted for in other installations or sectors. In order to achieve consistency between benchmarking curves and allocation in sectors, where some installations use CO_2 streams for production of chemicals, the following allocation formula should be used:

$$F_{P,basis}(k) = \frac{Em}{Em + B} BM_{i,k} \cdot HAL_i \qquad \text{Equation 12}$$

with

Em: Median annual direct CO_2 emissions to the atmosphere (i.e. the amount of CO_2 produced in the installation minus the amount of CO_2 bound in products) in the baseline period;

B: Median annual amount of CO_2 bound in products in the baseline period.

This approach may only be chosen in cases clearly indicated in the annex (section 9.1). The approach is applicable where the CO_2 consuming step is part of the installation under consideration, as well as in cases where the CO_2 is transferred to another installation. In the latter case, appropriate measures for data sharing between the installations involved have to be ensured for the baseline data collection.

[A list of production processes where this calculation is applicable will be presented after more discussion. Examples for potentially relevant products are: Ammonia/urea, bulk organic chemicals, PCC. Short lived products or applications of CO_2 not subject to emissions reporting are not eligible for such allocation corrections.

The final list of substances or applications is to be agreed also for use in the future Regulation pursuant to Article 14 of the ETS Directive.]

4.14.3 Refineries benchmark

For the refinery benchmark the historical activity level is expressed as total CWT per year (see below). For all processes within the refinery, a CWT function is assigned. Additional corrections are required for so-called off-sites (ancillary non-process facilities operating inside the refinery fence-line such as tankage, blending, effluent treatment, etc.) and for energy (heat and electricity). The preliminary allocation for CWT is then calculated as follows:

$$F_{CWT,basis}(k) = BM_{CWT,k} \cdot HAL_{CWTc} \qquad \text{Equation 13}$$

with:

$F_{CWT,basis}$: annual basis amount for CWT for year *k* (expressed as EUAs).

$BM_{CWT,k}$: benchmark for CWT in year *k*, expressed as EUA / CWT.

HAL_{CWTc}: corrected historical activity level expressed as CWT.

For the calculation of the corrected historical activity level for the refinery product benchmark (HAL_{CWT}), the following formula is used (considering off-sites and correcting of electricity production/ use):

$$HAL_{CWTc} = \left(1.0183 \cdot \sum_{i=1}^{n} \left(TP_i \times CWT_i\right) + 298 + 0.315 \cdot TP_{AD}\right) \cdot \frac{U}{T} \qquad \text{Equation 14}$$

with:

TP_i: throughput of the CWT function *i.*

CWT_i: CWT factor of the CWT function *i.*

TP_{AD}: throughput of the CWT function "Atmospheric Crude Distillation".

U: Emissions related to site activity without electricity i.e. emissions incurred at the site (excluding steam exports) plus deemed emissions from steam imports but excluding emissions from internally generated electricity expressed as tons of CO_2 (emission factor for electricity: 0.465 t CO_2/ MWh)

T: Emissions related to site activity (excluding steam exports) i.e. as above but now including emissions from electricity consumed either imported or internally generated calculated with a standard factor expressed as tons of CO_2 (emission factor for electricity: 0.465 t CO_2/ MWh)

The different CWT functions, their definitions, the basis for throughput as well as the CWT factors are listed in the annex (section 9.5).

4.14.4 Steam cracking (High value chemicals)

[to be added later]

4.14.5 Aromatics (including cumene)

For these product benchmarks, the CWT approach as described in section 4.14.3 is applied for the calculation of free allocation.

For the calculation of the historical activity level for the aromatics and cumene product benchmark, the following formula is used:

$$HAL_{CWTc} = \frac{U}{T} \cdot \sum_{i=1}^{n} \left(TP_i \times CWT_i \right) \qquad \text{Equation 15}$$

with:

HAL_{CWTc}: corrected historical activity level expressed as CWT.

U: Emissions related to site activity without electricity i.e. emissions incurred at the site (excluding steam exports) plus deemed emissions from steam imports but excluding emissions from internally generated electricity expressed as tons of CO_2 (emission factor for electricity: 0.465 t CO_2/ MWh)

T: Emissions related to site activity (excluding steam exports) i.e. as above but now including emissions from electricity consumed either imported or internally generated calculated with a standard factor expressed as tons of CO_2 (emission factor for electricity: 0.465 t CO_2/ MWh)

TP_i: throughput of the CWT function *i* (where only the 8 relevant CWT functions from the annex (section 9.5) are used).

CWT_i: CWT factor of the CWT function *i* (where only the 8 relevant CWT functions from the annex (section 9.5) are used).

Following CWT functions are in principle applied to determine the historical activity level of the aromatics benchmark (see section 9.5):

- Aromatic Solvent Extraction
- Cumene production
- Cyclohexane production
- Hydrodealkylation
- Naphtha/Gasoline Hydrotreating
- Paraxylene production
- TDP/ TDA
- Xylene Isomerisation

4.14.6 Product benchmark for hydrogen and synthesis gas production

[under further discussion]

4.14.7 Ethylene oxide / ethylene glycols product benchmark

[to be added later]

4.14.8 Vinyl chloride monomer (VCM)

For the determination of the preliminary number of free allowances for the production of vinyl chloride monomer, the following specific formula shall be applied:

$$F_{VCM,basis}(k) = \frac{Em_{dir}}{Em_{dir} + Em_{hydrogen}} BM_{VCM,k} \cdot HAL_{VCM} \qquad \text{Equation 16}$$

with:

$F_{VCM,basis}$: annual basis amount for VCM for year *k* (expressed as EUAs).

Em_{dir}: historical direct emissions for production of VCM (expressed as t CO_2(e)).

$Em_{hydrogen}$: historical virtual emissions from hydrogen combustion for production of VCM (historical hydrogen consumption for VCM production times 56.1 t CO_2/TJ) (expressed as t CO_2(e)).

$BM_{VCM,k}$: benchmark for VCM in year *k (expressed as EUA per ton of VCM)*

HAL_{VCM}: historical activity level for VCM production *(expressed as tonnes of VCM))*

In the context of the VCM benchmark it is important to state that the production of the intermediate product ethylene dichloride (EDC) is included in this benchmark. Dedicated EDC plants not producing VCM must not be allocated any free allowances, neither using the VCM benchmark nor using fall-back approaches.

5 SPECIFIC RULES FOR INCUMBENTS

[to be added if necessary]

6 SPECIFIC RULES FOR NEW ENTRANTS

[no changes added compared to previous version, new provisions under preparation]

6.1 Eligibility

6.1.1 Definition of new entrant

The Directive defines a new entrant[35] as

> *"— any installation carrying out one or more of the activities indicated in Annex I, which has obtained a greenhouse gas emissions permit for the first time after 30 June 2011,*
>
> *— any installation carrying out an activity which is included in the Community scheme pursuant to Article 24(1) or (2) for the first time, or*
>
> *— any installation carrying out one or more of the activities indicated in Annex I or an activity which is included in the Community scheme pursuant to Article 24(1) or (2), which has had a significant extension after 30 June 2011, only in so far as this extension is concerned".*

Indent 1 of the definition is most important for distinguishing between incumbents and new entrants for setting up the NIMs. It is discussed in section 3.2. and in the annex (section 10.2). The treatment of significant capacity increases (indent 3) is discussed in sections 6.1.2 and 10.3.

6.1.2 Definition of significant extension of installed capacity

As a precondition for eligibility as new entrant due to significant capacity extensions, the installed capacity before and after the extension must be determined pursuant to section 4.12.3. Only the difference between both values (the "added capacity" hereinafter) is relevant for determining if a capacity increase is significant. Only the "added capacity" is the basis for calculating of allocation from the new entrants reserve.

It is responsibility of the operator of the installation concerned to provide evidence to the satisfaction of the CA that the criteria below are or will be met. This means especially that the operator has to take care of having the installed capacity before the physical change determined and accepted by the CA before

[35] The Directive does not provide a definition for "incumbent installation". For the purpose of this paper, all installations which are covered by the EU ETS Directive and which are not new entrants are considered incumbent installations.

the significant extension happens. It is suggested that the determination of installed capacity is carried out as part of the baseline data collection.

The following criteria must be met in order to be able to qualify as an installation which had or will have a "significant extension of capacity"[36]:

1) An identifiable physical modification must be introduced in the installation, relating to its technical configuration and functioning, allowing for a production rate of that is [10-20]% higher than when utilizing the full installed capacity before the physical modification;

   and

2) this physical modification in the installation must enable the installation to run at a significantly higher activity level than before the physical modification. The activity level is significantly higher if the following conditions are met: When calculating the allocation for the “added capacity” of the sub-installation to which the capacity extension relates, the additional allocation is

   - more than [500] EUAs per year *and*
   - the additional allocation is more than [10-20]% of the previous allocation to that sub-installation or more than [50 000] EUAs per year.

Alternatively, capacity extensions as a consequence of “*de-bottlenecking*” (i.e. several consecutive smaller capacity extensions, which may include process optimisations without significant physical modification of the installation) are also eligible for treatment as significant extension, provided the thresholds set out under condition 2 above are met for at least one sub-installation, and if at least one physical modification of the installation has happened. In this case, the significant extension refers only to the sub-installation in which the thresholds are exceeded, and for the period after the date on which the CA has approved the new installed capacity.

Only net increases in the installed capacity of the 'installation as a whole' can comply with the criteria defined above. The mere replacement of an existing production line (with a comparable capacity) would not qualify as a significant extension.

Where cross-boundary heat flows are involved [subject to further discussion, see section 4.10], the new entrant is the installation which receives the allocation. As allocation is given to the consumer of the heat, this is usually the consuming installation. Only if the new installation or significantly increased production capacity is not covered by the ETS, the heat producer (or a part of its capacity) will be considered to be the new entrant.

[*Detailed guidance for operators and competent authorities might be provided at a later stage.]*

[36] The Directive does not provide a definition of "significant extension of installed capacity". Recital 16 of the revised ETS Directive mentions: "In these rules, significant extension should wherever appropriate be defined as an extension by at least 10% of the installation’s existing installed capacity or a substantial increase of the emissions of the installation linked to the increase of the installed capacity. Allocation from the new entrants reserve should only take place in respect of the significant extension of the installation.

6.2 Calculation of the free allocation

6.2.1 General approach

The final decision on the level of free allocation to completely new entrants ("greenfield plants") and installations which had a significant capacity extension (see section **6.1.2**) after 30 June 2011 can only be taken after the "starting date of normal operation" of the installation (see section **6.2.2**).

The amount of allowances that will be allocated will be:

1. based on the historical emissions allocation method for emissions during the commissioning phase of the new entrant[37] (see section 6.2.3). The commissioning phase is the period of testing before start-up of regular operation;

2. *[Subject to further elaboration as this separate phase in the determination of the allocation might be deleted]* based on general allocation methods (see sections 4.6 to 4.9) for the period after the commissioning phase but before the "starting date of normal operation", where:

    a. the same priorities for allocation rules shall be followed as stipulated in section 4.3;

    b. the HAL_i in the allocation methods are determined based on monitoring of real data)

    c. allocation is adjusted by the linear factor (see section 6.2.6).

3. based on the general allocation methods (see sections 4.6 to 4.9) for the period starting with the "starting date of normal operation", where:

    a. the same priorities for allocation rules shall be followed as stipulated in section 4.3;

    b. the HAL_i in the allocation methods are determined according to section 6.2.4

    c. allocation is adjusted by the linear factor (see section 6.2.6).

Points 1 and 2 are not relevant for significant capacity extensions as a consequence of "de-bottlenecking" and for significant reductions of capacity.

6.2.2 Definition of "starting date of normal operation"

The "starting date of normal operation" of an installation is relevant for determining the moment as from when a final allocation decision can be made. The "starting date of normal operation" of an installation is defined as:

> "the first day of a continuous 30-day period in which the installation operates at at least 40 percent *[threshold to be further discussed]* of its capacity (in case of significant extensions: 40% of the *added* capacity on top of the existing capacity). If the usual production cycle in the sector concerned does not foresee continuous production, this 30-

[37] This approach should ensure that no disadvantages arise for the operator during the commissioning phase.

day period may be split in sector-specific production cycles, leading in total to the 30-day period".

This date must:

1. have been verified by an independent verifier, assessing inter alia measurement data and other documents that prove the 30-day period and the 40 percent capacity utilization,
2. have been approved of by the Competent Authority of the Member State where the installation is situated.

[More guidance on the necessary verification and approval process will be provided in a later phase.]

6.2.3 Emissions during the commissioning phase of the new entrant

Emissions occurring during the commissioning phase of the new entrant (see section **6.2.2**) will be allocated allowances taking into account:

1. the period and year(s) when these emissions took place (as the exposure factor will be applied to them, see section 4.13);
2. that these emissions must be duly substantiated[38] and independently verified.

6.2.4 Determination of substitute data for "historical activity levels" for product benchmarks

6.2.4.1 New entrants (whole installations)

For new entrants (whole installations), the "historical activity levels" (HAL_i) in the equations in sections 4.6 to 4.9 and 4.14 in each of the relevant years (i.e. the year in which the installation started its "normal operations" and all other remaining years of the trading period) shall be replaced by substitute data as follows:

$$\boxed{HAL_i = PC_i \cdot SCUF_i} \quad \text{Equation 17}$$

With:

HAL_i: Historical activity levels for sub-installation *i*, expressed in the unit defined in the annex (section 9.1) for the production level for the relevant benchmark.

PC_i: Installed initial production capacity (as defined in section *4.12.3*) of sub-installation *i*.

$SCUF_i$: Standard Capacity Utilisation Factor for the product of sub-installation *i*, expressed as fraction. For determination of $SCUF_i$ see section 9.3.

[38] It must be substantiated that these emissions can clearly be attributed to the new entrant, and only relate to the period before the starting date of the new entrant.

For the period between the end of the commissioning phase and the “starting date of normal operation”, the HAL_i must be based on real monitored data.

For the year in which the installation started up its ”normal operations”, the same approach is used, but the calculated allocation is adjusted by the factor (remaining days between 'normal operation' starting date and end of calendar year / 365).

6.2.4.2 New entrants (due to significant capacity extensions)

For new entrants due to significant capacity extensions, only the added capacity is taken into account for calculating the free allocation, as the rest of the installation already gets free allocation under the rules for incumbents. The "historical activity levels" (HAL_i) in the equations in sections 4.6 to 4.9 and 4.14 in each of the relevant years (i.e. the year in which the installation started its “normal operations” and all other remaining years of the trading period) shall be calculated as:

$$\boxed{HAL_{i,added\ capacity} = PC_{i,added} \cdot SCUF_i} \qquad \text{Equation 18}$$

With:

$HAL_{i,added\ capacity}$: Historical activity levels for the added capacity of sub-installation i, expressed in the unit defined in the annex (section 9.1) for the production level for the relevant benchmark.

$PC_{i,added}$: Added production capacity (i.e. the difference of installed capacity as defined in section 4.12.3 before and after the change) of sub-installation *i* caused by the significant capacity change.

$SCUF_i$: Standard Capacity Utilisation Factor for the product of sub-installation *i*, expressed as fraction. For determination of $SCUF_i$ see section 9.3.

The “added capacity” is the difference of the capacities approved by the CA before and after the significant capacity increase.

6.2.5 Determination of substitute data for "historical activity levels" for fall-back approaches

[This section is intended for discussion purposes only]

The guiding principle for all allocations to new entrants is the attempt to treat new entrants and incumbents equally. Thus, instead of historic activity levels, other data has to be used, which is still representative for that sector. In case of product benchmarks (see 6.2.4) this is achieved by substituting the historic activity levels (HAL_i) with average capacity utilisation rates of the sector under consideration. In case of fall-back sub-installations this approach should be also used to the extent feasible. However, here HAL_i contains two elements which need specification:

I. the estimated level of production or service provided (e.g. how many tonnes of a non-benchmarked product will be produced), and

II. the estimated specific emission level per unit of product or service provided (e.g. how many TJ of measurable heat are consumed per tonne of non-benchmarked product, or how much process emissions are resulting from production of one tonne).

Due to the fact that fall-back approaches are to be used in sectors where no EU-wide information on product benchmarks exists, alternatives must be found. In order to provide for the best possible level playing field between incumbents and new entrants, rules could be applied as outlined below. The following cases must be distinguished:

A) The emissions, for which allocation should be granted, stem from the production of goods which don't have a product benchmark. In case of significant capacity extensions, this includes situations where additional emissions (e.g. from additional demand for measurable or other heat) are caused by addition of new production steps (downstream or as addition to the main production process) leading to different (e.g. higher quality) products.

B) The emissions stem from extension of an installation for heat production for supply of a district heating network or other non-ETS consumers.

Case A:

Regarding point I, first it is to be determined which product is relevant for capacity definition. Usually this will be quite clearly identifiable. In case of several subsequent production steps the delimiting production step has to be identified, i.e. the "bottleneck" which has the lowest relative production capacity. Where this is not clearly identified, the production step leading to the highest emissions may also be used.

If the whole significant extension of capacity consists of the addition of a new production step to existing processes, the capacity of that step only is relevant.

It is proposed to use an approach similar to product benchmarks, i.e. the production capacity times a standard capacity utilisation factor (SCUF). For determining the SCUF to be applied, the following methods could be envisaged:

- A generic SCUF of 80 % is applied for all sectors for which no product benchmark exists[39].
- In case of significant capacity extensions, the historic capacity utilisation rate of the previously installed capacity should be used.

Regarding point II (specific emission level), the following options could be envisaged:

- For heat / fuel benchmark:
    - o The specific energy consumption is determined after the "starting date of normal operation" (as defined in section 6.2.2) from verified data of at least one month of operation.
    - o The operator has to provide evidence to the satisfaction of the CA on the expected specific energy consumption (measurable

[39] For industries with seasonal character (like vegetable processing industries) other appropriate assumptions have to be made *[under discussion]*.

heat or other fuel combustion) of the new entrant. Acceptable information sources are *inter alia*:

- § Technical documents used for the planning of the installation / from the supplier;
- § Verified data from comparable installations;
- § In case of extension of existing production processes at the installation, the historic specific values of the previously existing installed capacity.

- If process emissions are involved, their determination could follow one of the following options *[under discussion]*:
  - o Process emissions are calculated based on the stoichiometry of the process carried out. For this purpose, the operator has to provide all necessary information (quantity and chemical composition data) regarding the raw materials and products as appropriate. This method can only be used for processes with stoichiometrical sources of process emissions[40].
  - o Process emissions are derived from verified emissions data after the "starting date of normal operation" (as defined in section 6.2.2) from at least one month of operation *[administrative details to be developed]*.

Case B (District heating and other non-ETS consumers):

[to be developed if needed]

6.2.6 Application of the linear factor

[to be added later]

6.3 Administrative issues

6.3.1 Application for new entrants allocations leading to final decisions

Applications for allocation to new entrants leading to final decisions on the amount of allowances to be allocated can only be introduced after the "starting date of normal operations" (see section **6.2.2**) of the new entrant.

Before the introduction of the application, operators have to adhere to the following procedure *[mentioned in general terms, relating only to cases where extensions of capacity are involved, exact procedures to be added later]*:

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[40] E.g. the decomposition of carbonates can be considered to be a stoichiometrical reaction, while e.g. the reduction of metals usually is not (if the temperature of the process is high enough for the Boudouard equilibrium being relevant). Another example for the non-stoichiometrical type of process emissions is N_2O emissions, as very efficient abatement technologies exist for removing N_2O, even if the original N_2O amount may stem from a stoichiometrical reaction.

1. Operator determines the 'existing' installed capacity (see section 4.12.3) of the installation[41] *[procedure/verification to be elaborated later]*;
2. Operator notifies change of 'existing' capacity to CA pursuant to Article 7 of the revised ETS directive;
3. CA decides whether change of 'existing' capacity would fall under the definition of 'significant capacity extension';
4. CA updates – if foreseen in national legislation – the GHG emissions permit and/or monitoring plan;
5. *[subject to necessity, see section **6.3.2**]* Operator applies for reservation of allowances based on planned "starting date of normal operations" and planned extension of capacity *[procedure/verification to be elaborated later]*;
6. *[subject to necessity, see section **6.3.2**]* CA decides on amount of allowances to be reserved in the NER;

After the "starting date of normal operation" of the new entrant, operators have to apply the following procedure *[mentioned in general terms, exact procedures to be added later]*:

1. Operator determines the "starting date of normal operation" of the installation and the verified emissions before the starting date *[procedure/verification to be elaborated later]*;
2. Operator applies to CA for allocation of allowances based on verified starting date of normal operation, verified emissions before that date and verified estimate for the substitute for "historical activity levels" (see sections **6.2.4** and 6.2.5);
3. CA calculates and decides on the level of free allowances for each remaining year in the trading period;
4. CA submits to the Commission the data on the new entrant and any free allocation to such installation in its territory.

6.3.2 Queuing system to reserve allowances prior to the starting date of an installation

The Commission shall keep track[42] of the amount of the new entrant reserve defined pursuant to Article 10a(7) of the revised EU ETS Directive. As soon as 50 % of this reserve, reduced by the amount used under Article 10a(8)[43], are used up, the Commission shall propose a suitable queuing mechanism.

[41] The determination of existing capacity is necessary before any extension of capacity can be applied for. In order to prevent cases in which no decision on the capacity increase can be made, a determination of existing capacity should be obligatory for all installations as part of the NIMs.

[42] E.g. by using the CITL.

[43] This is the amount reserved for demonstration projects of CCS and innovative renewable energy technologies.

7 SPECIFIC RULES FOR CLOSURES

7.1 Installations that have ceased operations

The definition given here for “installations having ceased operations” as referred to in Article 10a(19) of the revised ETS Directive refers to the complete installation with the boundaries defined in the greenhouse gas emissions permit. Installations that only *partially* cease operations are dealt with in section 7.2.

An installation is deemed to have ceased operations, if at least one of the following conditions is met:

- the greenhouse gas emissions permit of the installation has expired or has been withdrawn;
- another relevant permit (e.g. under IPPC) has expired or has been withdrawn permanently;
- operation or resumption of operation of the installation is technically impossible (e.g. because of permanent damage or removal of important parts of the installation);
- the installation has ceased operations, and the operator cannot demonstrate to the satisfaction of the CA that operation or resumption of operation of activities of the installation will resume in a specified and reasonable time.

An installation is deemed to be able to demonstrate that the production will resume within a "specified and reasonable time” referred to in the last criterion, if to the satisfaction of the CA the operator can demonstrate that operations will resume within [6 months] after the installation has ceased its operations.

Installations which are kept in reserve or standby (such as some district heating installations) and installations which are operated on seasonal schedule shall be exempt from the last criterion, if the following criteria are met:

- The operator can demonstrate to the satisfaction of the CA that the installation is used as standby or reserve capacity, or is regularly operated in seasonal patterns;
- The operator is holding a valid GHG emissions permit as well as all other relevant valid permits which are required by national legislation for operating that installation; and
- It is technically possible to start up operation of the installation at short notice, i.e. no relevant parts have been removed, damaged, etc, and maintenance is carried out on a regular basis.

The CA must make sure that when an installation has ceased operations, the installation will not be issued allowances in the year(s) following the cessation of operations.

Whenever it is unclear whether operations will resume within [6 months] after the installation ceased its operations, the CA is entitled to suspend the issuance of allowances to the installation having ceased operations in the year subsequent to the notification to the CA that operations have ceased. At the latest [12 months] after the notification of the cessation of operations, the CA is obliged to take a decision.

7.2 Installations that have partially ceased operations

An installation is deemed to have partially ceased operations as referred to in Article 10a(20) of the revised ETS Directive if it has reduced its activity level (i.e. production rate) of a "major sub-installation" below the thresholds listed in Table 2 compared to the "original activity level".

The "original activity level" is the historical activity level pursuant to section 4.11.1 plus the activity level used for all cumulated significant capacity extensions or reductions up to 31 December of the year before the drop in activity level considered here.

A "major sub-installation" is a sub-installation for which the allocation is either at least 30% of the installation's overall allocation in any year from 2013 onwards, or more than 50 000 EUAs per year, whichever is the lower value.

If the operator does not provide evidence to the satisfaction of the CA that the activity will be above the threshold listed in Table 2 again within a "specified and reasonable time" (see section 7.17.1), the CA shall adjust the level of free allocation accordingly for all subsequent years according to the following timetable:

- Member States shall ensure that operators are obliged to notify the CA without any undue delay if the activity level of a "major" sub-installation has dropped below the threshold listed in Table 2.
- The CA adjusts the free allocation according to the levels listed in Table 2 from the year immediately following the drop of activity level.

Table 2: Thresholds for adjusting the allocation of installations which have partially ceased operations pursuant to Article 10a(20).

If the activity level of a major sub-installation is…	**...the allocation to that sub-installation**
less than 50% below the initial activity level	is not adjusted
between 50 % and 75% below the initial activity level	is adjusted to 50 % of the initial allocation
between 75 % and 90% below the initial activity level	is adjusted to 25 % of the initial allocation
90% or more below the initial activity level	is adjusted to 0% if the initial allocation

7.3 Significant reduction of capacity

An installation undergoes a "significant reduction of capacity" in the sense of Articles 7 and 10a(20) of the revised ETS Directive, if the following criteria are met:

1) An identifiable physical modification must be introduced in the installation, relating to its technical configuration and functioning, leading to a production rate that is [10-20]% lower than when utilizing the full installed capacity before the physical modification[44];

   and

2) this physical modification in the installation must be in such a way that the installation will only be able to run at a significantly lower activity level than before the physical modification. The activity level is significantly lower if the following conditions are met: when calculating the allocation for the "reduced capacity" of the sub-installation to which the capacity reduction relates, the allocation corresponding to “reduced capacity” is

   - more than [500] EAUs per year *and*
   - more than [10-20]% of the previous allocation to that sub-installation or more than [50 000] EUAs per year.

The “reduced capacity” is the difference between the capacity before and after the capacity reduction as determined pursuant to section 4.11.3.

Only net reductions in the capacity of the "installation as a whole" comply with the criteria defined above, i.e. mere replacement of units of similar capacity is not relevant.

It is the duty of the operator of the installation concerned to inform the CA that the criteria above are or will be met without undue delay.

[*Detailed guidance for operators and competent authorities might be provided at a later stage.]*

7.4 Calculation and timing of changes to the free allocation

[to be added later – Provisions should be comparable to NE allocation methodology regarding administrative issues]

7.5 Administrative issues

7.5.1 Obligations for operators to notify to the CA (partially) ceased operations and significant capacity reductions

[to be added later, partly based on previous sections]

[44] The difference with 'ceasing operations' is that in this definition "physical modifications" have to occur, i.e. some units are removed or made unusable.

7.5.2 Obligations to inform the European Commission

[to be added later]

8 BASELINE DATA COLLECTION AS PART OF THE CIMS

8.1 Administration of free allocation

The following procedure shall be required by the CIMs for application when establishing the NIMs:

1. The CA establishes a list of installations to be included in the EU ETS from 2013 onwards, taking into account the Commission's non-paper "Guidance on Interpretation of Annex I of the EU ETS Directive (excl. aviation activities)" endorsed by the Climate Change Committee[45].
2. The CA ensures that all operators on the list are informed about their incl inclusion in the EU ETS, and are invited to hand in applications for free allocation as specified below.
3. Operators of installations which consider their installations eligible for free allocation submit applications for free allocation to the CA. The application has to include
   a. a baseline data report as outlined in section 8.3;
   b. a baseline data methodology report as outlined in section 8.9;
   c. a verification statement and report by an independent and competent verifier (for requirements see section 8.10);
   d. [subject to further discussion] a calculation of the preliminary[46] free allocation of the installation, applying these draft allocation rules.

   Where technical connections exist with other installations covered by the EU ETS, which are relevant for allocation rules, operators of such installations shall identify all relevant connected installations and inform the CA thereof. Member States ensure that all relevant information for correct callculation of free allocation can be achieved. For this purpose, Member States are especially encouraged to consider requiring operators of technically connected installations to file one joint application[47] for free allocation. "Technical connections" relevant are

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[45] http://ec.europa.eu/environment/climat/emission/pdf/100318_guidance_interpr_annex_i_final.pdf

[46] „Preliminary" as outlined in section 4.5.1.

[47] Where transfer of heat, waste gases, or transferred CO_2 are relevant, data is needed from receiving as well as from transferring installations. Firstly, the pairs must be identified, secondly the data must be matched, and thirdly the allocation in those cases has to be corrected compared to the

- cross-boundary transfers of heat,
- cross-boundary transfers of waste gases,
- cross-boundary transfers of CO_2 used as feedstock.

Where technical connections exist with other installations not covered by the EU ETS, which are relevant for allocation rules, Member States shall ensure that the operator of the installation concerned shall provide evidence on that relationship to the extent it is necessary for free allocation to the CA (e.g. the carbon leakage exposure status of heat consumers).

4. The CA assesses the data received regarding:
   a. Completeness of the data received. Only verified data is acceptable[48].
   b. Eligibility for free allocation of the installation and all its technically connected installations.
   c. Determination of applicable allocation methods, carbon leakage exposure factors, and correction methods where relevant.
5. The CA calculates the annual basis amount and the preliminary allocation for the whole installation / the whole group of technically connected installations. Where relevant, the allocation is distributed between the technically connected installations following the appropriate rules for correcting allocations.
6. Following national legal requirements, appropriate consultations with operators and the public are carried out.
7. The NIMs containing the annual basis amount and preliminary total free allocation of all installations eligible for free allocation are notified to the Commission.
8. The Commission determines if and which value of the uniform cross-sectoral correction factor is to be applied.
9. If necessary, the CAs amend the NIMs using the uniform cross-sectoral correction factor.

8.2 Process of data collection

Competent Authorities (CAs) will have to identify all installations falling under the EU ETS as the first step of establishing their National Implementing Measures (NIMs) pursuant to Article 11 of the revised EU ETS Directive. In order for the CA to be able to apply the harmonised allocation methods, the identified installations will be required to collect appropriate monitoring data regarding emissions, production levels and (if relevant) heat transfers of the years defined as the baseline period, to have these data verified and to report them to the CA.

basic allocation rules in a way that the overall allocation is the same as if the whole activity were carried out within one single installation.

[48] The CA will have to establish a suitable mechanism for resolving problems with negative or qualified verification statements. However, data submitted without a verifier's report is unacceptable.

The baseline period is defined in section 4.11.1. All installations will have to report all relevant parameters for each year of the full baseline period in which the installation has been operating[49], regardless of any claims for the discarding of individual years or claims due to significant capacity extensions or reductions. Only by this approach the CA can decide if the relevant specific rules can be applied.

An overview of the required data is given in the annex, section 9.4. The Commission should provide harmonised reporting templates for this data collection. All actors involved (operators, verifiers, CAs, the Commission) should make use of advanced information and communication technologies (ICT) to the greatest extent possible.

8.3 Content of the baseline data reports

The aim of the baseline data collection is to get all data which is relevant for applying the allocation rules laid down in this discussion paper. Furthermore the CA needs additional information which can underpin the plausibility, completeness and freedom from double-counting of data reported, and which supports the verification process. Therefore the baseline data reports of each installation will comprise the information presented in the the annex (section 9.4). The data is to be reported disaggregated for each sub-installation and for each year of the baseline period. Where only one sub-installation is defined (because only one benchmark is relevant, or because only one fall-back approach is to be applied), only totals for the installation have to be reported. Different reporting requirements apply for sectors which are separately treated in section 4.14 (e.g. sectors using the CWT approach).

Special care is to be taken for identification of all involved installations (using the installation ID used in the registry system) where technical connections exist which are relevant for allocation. These are especially cross-boundary heat transfers, transfer of CO_2 and transfer of waste gases.

Furthermore the installation's installed capacity as defined in section 4.12.3 on the reference date 31 June 2011 is to be determined and reported for each allocation-relevant process in the installation.

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[49] Installations which are kept in reserve or standby (such as power plants and district heating installations) and installations which are operated on seasonal schedule shall be considered to have been operating in all years of the reference period, in which the following criteria are met:

- The operator can demonstrate to the satisfaction of the CA that the installation is used as standby or reserve capacity, or is regularly operated in seasonal patterns,
- The operator is holding a valid GHG emissions permit and all other relevant valid permits which are required by national legislation for operating that installation, and
- It is technically possible to start up operation of the installation at short notice, i.e. no relevant parts have been removed, damaged, etc, and maintenance is carried out on a regular basis.

By this approach representative data over the whole period is gathered also from installations which are operated only occasionally. Installations which don't meet those criteria can be considered to have ceased operations during the reference period.

8.4 Requirements for data quality

As a guiding principle, the *best available data* is to be used for the baseline data report, while maintaining the feasibility and practicability of the general approach. The operators of installations applying for free allocation shall apply due diligence when compiling the baseline data report. The chosen methods for determining the different data sets, including information on the measurement instruments, data sources, calculation methods and quality assurance systems, are to be documented in a baseline data methodology report (see section 8.9) which is submitted to the verifier together with the baseline data report.

Types of data to be reported are:

A) Emission data and source stream data including information on transferred[50] CO_2 as required by the MRG for reporting at activity/installation level and based on a monitoring plan approved by the CA. Type A is applicable for:
- Activity data for source streams (based on invoices or metering),
- Emissions and energy content,
- Emission, oxidation and conversion factors, carbon and biomass content,
- CEMS based data on GHG emissions (with proxy data for the above parameters),
- Transferred CO_2.

B) Same as under A, but without approved monitoring plan, because the installation under consideration or a part of that installation has not been included in the EU ETS before 2013;

C) Data for which no provisions in the MRG exist, that is especially production data (characterisation and quantification of goods) and data on imported and exported (measurable) heat. Guidance for monitoring is provided in sections 8.5 (heat) and 8.6 (production data) of this discussion paper;

D) Attribution of the above data to sub-installations, including reporting on the methodology therefore. Guidance for attribution of data to sub-installations is provided in section 8.7 of this discussion paper.

Due to the huge variability of technical situations in individual installations, no complete list of data acquisition methodologies can be given. Therefore some general flexibility is needed for data collection (except for data type A). The following non-exhaustive list of methods for data determination gives an indication for what can be regarded *best available data*:

1. Data is produced under an approved monitoring plan and independently verified[51]: This is considered to be the best available data. It can be as-

[50] Transferred CO_2 is regulated by MRG Annex I, section 5.7, this includes also the transfer of CO_2 as constituent of waste gases. Since waste gases are treated like other fuels in the MRG, the relevant provisions also refer to “inherent CO_2”, section 5.5 paragraph 7.

[51] However, the verification is not a requirement in itself, as the baseline data has to be verified anyway.

sumed that the highest tier feasible without leading to unreasonable costs has been applied, and that regular quality assurance and control (QA/QC) is carried out, especially that measurement instruments are maintained and calibrated.

2. Data is produced without approved monitoring plan, but with a methodology in accordance with the MRG: Perhaps in some cases lower tiers than required by the MRG are applied. Relevant QA/QC should also be expected to be less strict than under an approved monitoring plan. As a consequence data gaps are more likely to occur than under an approved monitoring plan. However, if the methodology is transparently documented, this type of data will usually be acceptable as the best available data due to a lack of alternative data sources, especially for all parameters except activity data.
   For activity data (amount of fuels consumed etc.), data sources as described under the next point are preferred.
   If the tiers applied are more than one step lower than required by the MRG, the operator should make appropriate efforts to corroborate the data by other data sources, and by horizontal and vertical checks (see MRG Annex I, section 10.3.3).

3. Especially for production data and heat purchase/supply data, financial data (invoices) and data from operation protocols etc. can be used[52]:

   a. Data produced for commercial or legal purposes is preferred (highest data quality), i.e. where the financial interest of a second party and/or legal requirements[53] ensure a certain data quality. This is especially the case for data used for invoicing, taxation and customs declarations.

   b. Data which has already been subject to independent (financial) audits is also considered of highest quality.

   c. Data reported for the use by statistical offices is considered useful, especially for determination of NACE and PRODCOM classifications. In cases of doubt confirmation from the statistical office on the correctness of these classifications should be sought. Quantitative data reported to the statistical office should only be used for corroboration purposes. As sole data source statistical data should only be used if the statistical office can confirm that it has carried out some verification or quality control on that data.

   d. Data from operation protocols and similar can also be used if no other sources are available. Care should be taken that only protocols are used which are transparently documented[54] and cross-checked by a second person (four eyes principle).

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[52] Note that appropriate methods have to be applied to correlate production data with sales data, which will involve especially inclusion of stock data.

[53] An example for relevant legal requirements is the regular calibration of measurement instruments for commercial use carried out by accredited institutions.

[54] As production protocols are often produced only for internal purposes of a small group of people, it can happen that some additional information is needed for interpretation. Therefore such proto-

4. In practice, certain historical data is only indirectly available through known correlations to other data which is available[55]. In such cases it may be necessary to determine the correlation factors by experimental tests over shorter periods[56] for application to the known historical data in the baseline period.
   Such correlations will usually not be classified as best data, but subject to the availability of better data, it might be necessary to use such correlations.
5. It is also possible that correlations between known historical data and data needed for reporting exist which can be determined by calculation without further experimental support. The quality of such data can be from high to acceptable, depending on the quality of the directly available data and the assumptions which may be necessary.
6. For missing parameters[57] estimation methodologies have to be used. Any estimation has to be based on the most recent state of scientific and technical knowledge. As far as no CEN, ISO or national standards or draft standards are available, commonly accepted approaches (industry best practice) may be used.
7. For the attribution of fuels and raw materials, heat input, emissions and production data to individual sub-installations, often the installation's total figures have to be split. In this case it is preferable to subtract data for the sub-installation with the best available data from the total consumption / production data instead of applying estimation methods of lower quality to each single sub-installation. For minor sub-installations, estimations will often be sufficient.

8.5 Guidance on determining heat flows

8.5.1 General aspects of heat measurement

It is important to define appropriate system boundaries for the amount of heat to be measured. The general rule is that the system boundaries are to be set around the heat consuming process (the "heat consumer"). Whenever the following section refers to "heat consumer", the relevant entity is either

I. a sub-installation with a product benchmark,

cols should only be used if a clear documentation (instruction to the personal producing the protocol) is available, which clarifies inter alia "which instrument has been read, what does the reading mean" (units), reliability of the measurement,...

[55] Process control systems often use the parameter which is simplest to determine, which is often a voltage of a current output of an instrument instead of the physical unit measured.

[56] Tests over at least three months are advisable for such estimations.

[57] Missing parameters can be e.g. the biomass and carbon content, NCV and emission factor of materials that have been used in the past, but no analysis is possible any more, or the heat consumption of a process or other parameters for which no direct correlation to existing data can be found.

II. a sub-installation which gets allocation via the heat benchmark allocation method[58],

III. another EU ETS installation as external consumer,

IV. another installation which is not included in the EU ETS, or

V. a non-installation consumer (a district heating network).

Due to the principle rule of allocation to the consumer, it is important to sum up all inputs of measurable heat for each of these consumers. Inputs means here production of measurable heat in the installation as well as import from other installations. Cases I and III are only relevant for determining the amount of heat for which the installation does *not* get an allocation based on a heat benchmark, i.e. the amount of measurable heat to be subtracted from the total measurable heat input. Cases IV and V lead to allocation to the installation, but as an exemption from the general rule (see section 4.7).

8.5.2 Determining net heat flows

Net heat flow equals heat delivered to the consumer minus heat returned from the consumer. Thus, for determining the net amount of heat which crosses the system boundaries of the consumer, the following parameters are needed:

- The heat delivered to the consumer in the heat transport medium (expressed in TJ). In order to determine the heat, one has to determine
    - The mass flow of the heat transfer medium (which may need measurement of the volumetric flow and the density),
    - the temperature in the case of liquid transfer media, and temperature and pressure (and steam saturation) for other media. With this information, the amount of heat per mass of transfer medium can be determined, e.g. using literature values (e.g. steam tables) or suitable engineering software.

  In case the heat delivered to the consumer is not measured, the heat delivered must be determined using a proxy approach (see section 8.5.3).

- The heat returned to the producer, again needing information on mass flow, and state of the medium (temperature, pressure, saturation,...). Where the transfer medium is not returned to the heat producer (e.g. where the condensate is discharged to wastewater), or where the amount and/or the state of the return flow is unknown, conservative assumptions are to be made:
    - For all transfer media except steam it is assumed that the return mass flow equals the mass flow delivered, and that the tem-

[58] As each sub-installation represents one combination of one allocation method and one carbon leakage exposure status, a sub-installation can encompass several production processes. It is also possible, that parts of one production process are covered by different fall-back approaches, and are therefore part of several sub-installations. For avoiding double allocation it is important to quantify all measurable heat flows and energy input from other fuel combustion.

perature of the return flow is equivalent to the temperature at the exit of the consuming process.

- For steam, it is assumed that the return mass flow equals the mass flow delivered, and that $T_{condensate} = 90°C$.

All installations which have occurrences (production, consumption, import or export) of measurable heat will have to carry out a corroborating heat balance calculation as part of the baseline data collection. The condition to be proven by this calculation is that the total amount of measurable heat is not more than the energy input to that installation:

$$Q < E_{IN}$$ Equation 19

Where Q is the sum of all net heat consumptions in TJ (heat flows consumed within the installation plus heat flows exported), all with positive values, and E_{IN} being the sum of all energy inputs to the installation in TJ, that is energy input from fuels, heat from exothermic reactions and imports of measurable heat, also taken with positive values[59]:

$$Q = \sum_i Q_{cons,i} + \sum_j Q_{export,j}$$ Equation 20

$$E_{IN} = \sum_m E_{IN,fuel,m} + \sum_n E_{IN,reaction,n} + \sum_p E_{IN,heatimport,p}$$ Equation 21

This corroborating calculation should provide evidence that only net heat flows have been used, and that no double use of the same heat is taking place.

For complex installations, the operator may propose to the CA appropriate simplifications of the total heat balance, provided that this is done in line with methods based on the most recent state of scientific and technical knowledge, and that evidence is provided that no double allocation of heat happens.

8.5.3 Proxy data for measurable heat

Where no historical data on measurable heat production/consumption are available, a proxy value for the historical measurable heat will be calculated from the corresponding energy input E_{IN} (based on NCV of the fuels) by multiplying with a suitable reference efficiency of heat production:

$$HAL_{H,i,proxy} = h_H \cdot E_{IN}$$ Equation 22

$$E_{IN} = \sum_j AD_j \cdot NCV_j$$ Equation 23

$HAL_{H,i,proxy}$ is expressed as TJ. Here AD_j is activity data (fuel consumption in t or Nm^3) for fuel j, NCV_j is the net calorific value (TJ/t or TJ/Nm^3) of fuel j, and η_H is the efficiency for heat production. The efficiency of heat production may be based on the technical documentation (design values) of the installation, or on

[59] When doing a complete heat balance for a system, usually heat exports from a system are assigned negative values and heat inputs are used with positive values. Using this method consequently, the operator may also use such balance for showing that not more heat is used than entering the installation in the form of fuels, measurable heat and heat from exothermal reactions.

suitable measurements carried out under the supervision of the competent authority or a competent body authorised by the competent authority. If neither of these approaches is feasible, a reference value for $\eta_{ref,H}$ shall be used *[value under discussion; in the range of 0.7 to 0.8]*.

Note that in the case of CHP units only the amount of fuel input attributable to usable heat production is to be used as E_{IN} in the equation above. Therefore, this $E_{IN,Heat}$ is calculated from the total energy input of the CHP ($E_{IN,CHP}$) as follows:

$$E_{IN,Heat} = E_{IN,CHP} \cdot \frac{(h_{heat} / h_{ref,heat})}{(h_{el} / h_{ref,el} + h_{heat} / h_{ref,heat})} \qquad \text{Equation 24}$$

Where η_{heat} is the efficiency of heat generation, $\eta_{ref,heat}$ is the reference efficiency of a stand-alone boiler, η_{el} is the efficiency of electricity generation, and $\eta_{ref,el}$ is the efficiency of a reference electricity generation without CHP. Appropriate reference values can be taken from Commission Decision 2007/74/EC[60].

In case that the necessary data for using equation 24 is not available, a suitable estimation must be used. For further details on acceptable estimation methods see section 8.4.

If not all the measurable heat from a certain boiler or CHP can be considered for allocation under method B, because the heat is consumed by several installations or sub-installations, the amount of heat delivered to each consumer *i* ($Q_{delivered,i}$) must be known[61]. With this, $HAL_{H,i,proxy}$ can be calculated as

$$HAL_{H,i,proxy} = HAL_{H,total,proxy} \cdot w_i = HAL_{H,total} \cdot Q_{delivered,i} / Q_{produced} \qquad \text{Equation 25}$$

where $HAL_{H,total,proxy}$ is the proxy for the total amount of measurable heat, and $Q_{produced}$ is the total amount of heat produced in this boiler or CHP under consideration.

8.6 Guidance on monitoring and reporting of Production Data

[to be elaborated]

Guiding principles:

- *Selection of relevant products: see product definitions based on sector rule books (see annex section 9.1) In value chains the BM-relevant product has to be selected, system boundaries laid down in rule books are to be respected.*
- *For other products not within the system boundaries: Report only if production process leads to emissions, i.e. if an additional sub-installation can be defined, there can be eligibility for free allocation. In such case*

[60] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:032:0183:0188:EN:PDF

[61] Where no measurement for the attribution of heat to (sub-)installations is available, a suitable estimation method must be used. For further details on acceptable estimation methods see section 8.4.

the production data is relevant (for also for capacity definition and NE/closure rules)

- *Products and services related to fall-back approaches must be identified as well for determination of the CL status.*
- *Double counting is to be avoided*
- *Production levels: Unless otherwise specified in the production definitions of section 9.1, net production levels (=production of saleable products) are used, i.e. products discarded due to not meeting quality standards, and amounts of waste recycled internally are not counted as product. Suitable rules based on what has been said in section 8.4 will be developed.*

8.7 Guidance on Attribution of Data to Sub-installations

8.7.1 General approach

The starting point is a comprehensive description of the installation in form of a "list of everything" (production processes, physical units, source streams, emissions, energy flows, types of products…). The aim is a final list of sub-installations containing the same "everything", but distributed to the individual sub-installations. Thus, "attributing to sub-installations" means to delete an item from the list for the installation as a whole, and put the same item onto the list of the sub-installation.

The description of the installation and of the final list of attribution to sub-installations forms an essential part of the baseline data methodology report.

Note: As mentioned in section 4.1, an installation needs only division into sub-installations if more than one allocation method is to be applied. Thus, simple installations, such as installations that receive allocation only for one product benchmark, or which produce heat for only one production process, do not need to go through this attribution process.

[It is acknowledged that the attribution of data to sub-installations may impose a significant administrative burden on operators as well as on competent authorities. Therefore it will be discussed if simplified approaches especially for small emitters can be developed.]

8.7.2 Step-by-step guidance

1. The operator of an installation will start the baseline data collection by analyzing his installation. Besides the items to be listed as outlined below, the choice of data sources to be used will be of relevance (see section 8.4 on "best available data). Result of that analysis is a list[62] of all items rele-

[62] "List" means here both a list of items (qualitatively) and of their quantities, if relevant. E.g. a physical unit is only listed regarding its existence ("boiler B1" or "rotary kiln 3") and quality ("used for production of products X and Y"), while a fuel will be listed with its description (type, NCV, emission factor, etc) as well as its quantity (tonnes consumed per year, emissions and energy input per year resulting from its use).

vant for emissions, production and allocation (hereinafter referred to as the “initial list”):

- All source streams[63] with all MRV-relevant parameters such as activity data, NCV, emission factor, oxidation factor, conversion factor, carbon content, biomass content, as appropriate;
- All energy inputs (activity data times NCV) and emissions (calculated pursuant to the MRG) corresponding to these source streams;
- All production processes and physical units (emission sources);
- All goods and services produced, including tradable and storable intermediates as well as waste streams (whether recycled internally or disposed of externally);
- All relevant cross-boundary flows[64] of measurable heat, waste gases and “transferred CO_2”;
- For completeness reasons: production, consumption, export and imports of electricity.

2. Substitute data are determined for data gaps, and proxy data is determined where necessary in order to get complete data sets also for items which are not directly available, especially for heat flows (proxy data for measurable heat calculated from fuel input, determination of the heat-related part of CHP fuel input and emissions,…).
3. The list of the installation’s products is analysed on the basis of the product definition list in the annex (section 9.1). A preliminary list of sub-installations is the result: One sub-installation for each benchmarked product (or product group) for which a match between the annex (section 9.1) and the installation’s products is found, plus the maximum of 6 fall-back sub-installations. All the products and services of the installation are attributed to that preliminary list of sub-installations. Products, by-products and waste streams which don’t lead to emissions during manufacture are attributed only as memo-items.
4. As a next step the physical units (emission sources) are attributed to the sub-installations (taking into account the system boundaries for the product benchmarks laid down in the annex (section (9.1)):
   a. Units which are used exclusively for one production process are attributed directly to the appropriate sub-installation.
   b. Units used by several production processes are proportionally attributed to all relevant sub-installations. A *distribution key* for data related to that unit must be defined for splitting e.g. fuel consumption and related emissions to the sub-installations. How the distribution key is de-

[63] In this chapter several terms are used which are defined in the MRG 2007, such as “source stream” meaning fuels and materials leading to emissions as a result of their consumption or production.

[64] “Cross-boundary flows” here means imports or exports across the system boundaries. Depending on the context, the system boundaries usually refer to the whole EU ETS installation (as defined by the GHG emissions permit), or in fewer cases to the sub-installation.

termined depends on the best available data and the way how the physical unit is used:

i. If the unit is used sequentially for different products (e.g. a paper machine producing different paper grades one after the other), the most suitable distribution key will be based on production protocols, expressed as usage time per year for each sub-installation.

ii. If the unit serves several production processes simultaneously, but there is no measurement for monitoring the different process feeds (e.g. a glass furnace feeding several machines for different glass products), the distribution key may be based on tonnes of different products produced, taking into account known or estimated specific energy consumptions for each process, where relevant, or other similar suitable data sources subject to availability of best available data (see section 8.4).

iii. If the unit serves several production processes simultaneously with the possibility to measure the feed to the different processes (e.g. a CHP supplying the production processes for several chemicals), the distribution key is based on those measurements.

c. Where several units serve exclusively the same sub-installation, they may be treated as one joint unit, i.e. fuel and emission data etc. don't have to be disaggregated to the level of the unit. Similarly boilers and CHP units feeding into one common steam grid may be treated as one joint heat supply system.

5. The source stream data (emissions, energy content,…) is attributed to sub-installations using the previous attribution of physical units, in which these source streams are used (i.e. where they lead to emissions). The system boundaries for the product benchmarks laid down in the annex (section 9.1) have to be taken into account.
First source streams exclusively linked to individual units (or groups of units defined under 4.c) are attributed, thereafter those where the distribution keys developed under step 4.b have to be applied. Priority is given in the same sequence as the allocation methodologies are to be applied, i.e. product benchmarks before the fall-back approaches.
Where de-minimis amounts of a source stream are difficult to attribute due to a lack of measurement or unreasonable costs for carrying out precise attribution, they can be attributed to the sub-installation where the major part of the source stream is attributed to. "De-minimis" means less than 5% of the fuel stream, and an of equivalent less than 500 t CO_2.
The following rules shall furthermore apply:

a. If the source stream is a fuel, two types of entries on the list are possible: If the (part of the) fuel is used for the production of electricity or measurable heat, it is attributed to the physical unit(s) where it is combusted as a memo-item only (i.e. only for completeness check, but not relevant for allocation). Amounts of fuel used for "other fuel combustion" as defined in section 4.4 are fully attributed to the relevant sub-installation for allocation method C (fuel benchmark), taking into account the carbon leakage exposure status of the production process where the energy from the fuel is used.

b. Source streams which are process emissions (for definition see section 4.4) are attributed either to a sub-installation for a product benchmark, or to one of the sub-installations for allocation method D (historical emissions allocation method), taking into account the carbon leakage exposure status of the production process where the emissions from that source stream occur.

c. Source streams which form part of a mass balance for the purpose of the MRG are treated like fuels if they are materials are combustible (i.e. they have a NCV to report and could be used as fuel in other context). All other materials in the mass balance are treated as process emissions. If possible, the whole "process part" of the mass balance should be considered as one source stream. If the result of the mass balance without the fuels leads to a negative result, zero process emissions are attributed to the relevant fall-back sub-installation.

d. Emissions of non-CO_2 greenhouse gases are always treated as process emissions.

6. For emissions which are monitored using CEMS (Continuous Emissions Monitoring Systems), the proxy data used for the corroborating calculations pursuant to the MRG are used for attribution to sub-installations.

7. For attribution of measurable heat, the consumption levels rather than the production levels are important for allocation. The attribution of heat is dealt with in a separate procedure (see section 8.7.3).

8. Treatment of waste-gases: *[under discussion]*

a. Import of waste gases is treated like any other fuel. However, if waste gases have been fully included in a product benchmark, no further allocation for the downstream use of the waste gases is given. Consequently, in such case the energy input and emissions, the measurable heat produced and consumed and other fuel combustion are only attributed in the form of memo-items.

b. Export of waste gases: The amount of waste gas exported from a sub-installation with product benchmark to other installations or sub-installations is treated like a subtraction from the total fuel input to the sub-installation producing the waste gas. However, if waste gases have been fully included in a product benchmark, no further allocation for the downstream use of the waste gases is given. Consequently, in such case the waste gas is not subtracted from that sub-installation.

c. Waste gases resulting from processes not subject to a product benchmark are treated like fuels or process emissions respectively, as defined in section 4.4.

9. Import or export of CO_2 as feedstock: Attribution of import of CO_2 to sub-installations is done in the form of memo-items for carrying out plausibility checks. The export is fully attributed, as the historical activity data of that export is relevant for the allocation formula.

10. Consumption of electricity: Attribution is only made if there are sub-installations with product benchmarks where the allocation rules from section 4.14 require information on the electricity consumption.

11. As a final step, the completeness of attribution to sub-installations is checked (the "initial list" has to be empty now). The occurrence of double counting is checked by summing up the values of each attributed item (emissions, activity data,…), which must give the same result as when summing up the "initial list". Finally, all sub-installations without any attribution except memo-items are removed from the list of sub-installations relevant for allocation of allowances.

8.7.3 Attribution of measurable heat to sub-installations

For the calculation of allocations, information on heat flows is needed as follows:

A) Where an installation contains a sub-installation which is eligible for allocation using the heat benchmark (method B), the amount of measurable heat consumed by that sub-installation is to be determined.

B) Where a sub-installation is eligible for allocation using the fuel benchmark (method C), the energy content of the related fuels is to be determined.

C) Where cross-boundary heat flows take place, the amount of measurable heat transferred needs to be determined for carrying out corrections to the allocation of the technically connected installations.

D) The amount of heat consumed by sub-installations under product benchmarks must be known in order to carry out cross-checks for preventing overlaps between sub-installations (double allocation) or data gaps.

The following procedure is to be used for determining the data needed:

1. All sources of measurable heat in the installation (boilers, CHP, heat exchangers from exothermic processes...) and all heat import sources are listed. For each source the fuel input and the net heat exported should be determined. Sources leading to "other fuel combustion" (such as direct heaters, furnaces or dryers, see section 4.4) are kept in a separate list which is treated in section 8.7.2.
   Exothermic processes are treated like other sources of heat. Note that processes can act as consumers and producers of heat simultaneously, if either an exothermic process is driven by heat input, or if not all the heat received is used in the process, but passed on to other processes, but at a lower temperature/pressure level. As net heat flows to/from that process are relevant, the heat balance will determine if this process acts as net source or consumer of heat.

2. All consumers of measurable heat and heat export recipients are listed.

3. Proxy data based on the energy input from fuels are to be determined for all measurable heat flows for which no measurement devices exist between the heat source and the point where the heat is entering a grid

or the consuming process boundaries. This is done in accordance with section 8.5.3.

4. All 1:1 relationships are treated first: Heat sources, which can be attributed to a unique consumer (consumer = sub-installation or external consumer) without ambiguity, are attributed to those consumers.

    a. If the consumer is a sub-installation with product benchmark, the heat flow needs no further attention. It is attributed as memo-item.

    b. If the consumer is a sub-installation with fall-back approach allocation, the heat consumption is attributed to this sub-allocation and needs quantification.

5. Thereafter, for heat sources that are used by more than one consumer inside the installation or outside, the amount of heat needs to be distributed between the various consuming (sub-)installations. Where several heat sources supply one consumer or where they feed heat into a network (e.g. a steam network in a chemical installation), these sources can be treated as if they were one common source. The relevant provisions for determining distribution keys laid down in section 8.7.2, point 4.b, are to be used as appropriate. The following steps are carried out:

    a. Where measurement devices for heat flows exist between (sub-)installation boundaries, measured historical values are used. For further rules on heat measurement see section 8.5.1. As under point 4, heat flows attributable to product benchmarks are attributed as memo-item only, while heat flows to fall-back approach (sub-)installations are fully attributed to the consuming (sub-)installation.

    b. All measured heat flows quantified under point a are subtracted from the total amount of measurable heat considered under point 5. If all heat flows are measured, the remaining heat should be zero. Any heat which is not consumed by defined consumers is considered to be heat loss. Such heat losses should be identified by this calculation, but they are not eligible for allocation using the heat benchmark methodology.

    c. Heat flows to defined consumers which are left over from step b, i.e. heat flows to consumers where no dedicated heat flow measurement devices exist, must be attributed to consumers using suitable estimation methods based on the most recent state of scientific and technical knowledge. As under point a, heat flows attributable to product benchmarks are attributed as memo-items, while heat flows to fall-back approach (sub-)installations are fully attributed to the consuming (sub-)installation.

8.8 Treatment of Data Gaps

Principle: All missing data has to be substituted with conservative estimates already before verification, or at the latest during verification when the verifier detects data gaps[65].

"Conservative" is to be defined here as follows: "Conservative" means that a set of assumptions is defined in order to ensure that parameters relevant for allocation of free allowances are assigned values in a way that the resulting allocation is not higher than with application of the true value of that parameter.

This means that:

- For product benchmarks, the conservative substitute data is *[90%, to be decided]* of the average production volume in the part of the baseline period where data is available.
- For heat benchmark allocation, the conservative substitute data is *[90%, to be decided]* of the average amount of measurable heat in the part of the baseline period where data is available.
- For fuel benchmark allocation, the conservative substitute data is *[90%, to be decided]* of the average amount of fuel input in the part of the baseline period where data is available.
- For the historical emissions allocation method, the conservative substitute data is *[90%, to be decided]* of the average historical process emissions in the part of the baseline period where data is available.

Some data to be reported is not directly used for allocation, but for corroborating purposes and plausibility checks only, like e.g. the consumption data of individual fuels in a sub-installation related to a product benchmark. Gaps in such data sets should be replaced by best estimates based on best available data (correlated parameters), taking into account the most recent state of scientific and technical knowledge.

If data gaps cover longer periods in the baseline period, or if the data gaps are material regarding parameters directly needed for allocation (HAL_i in sections 4.6ff), data gaps may lead to a negative verification opinion. This case is treated in section 4.11.4.

8.9 Baseline data methodology report

In order to make the methodology of baseline data collection transparent to the CA and verifiable for the verifier, the operator will be required to annex a *baseline data methodology report* to the baseline data report. The function of this methodology report is similar to that of the approved monitoring plan for annual emissions reports: It enables to assess how the data has been compiled, and what the different data sources, calculation steps and further assumptions are. The main differences to the monitoring plan are:

[65] Of course also all other material and non-material misstatements found by the verifier have to be corrected.

- Instead of defining requirements for the quality (uncertainty) of the data, this report merely describes the factual quality.
- The verifier has to assess the quality of the methodology regarding its acceptability, while the monitoring plan is approved by the CA before use and before verification of emission data.
- The MP has to be in accordance with the MRG. For the methodology report the quality criteria are to be set by the CIMs.

The baseline data methodology report shall contain at least the following information:

1. System boundaries of the installation and all the sub-installations determined (including plans and flow charts as appropriate);
2. List of sub-installations, specifying the applicable product benchmark or fall-back approach, and the NACE/PRODCOM code(s) applicable;
3. Monitoring methodology (per sub installation):
   a) Description of the measurement and calculation methodology for historical activity levels and the parameters needed to determine them;
   b) Description of data gap treatment;
   c) Uncertainty evaluation;
   d) Description of the data flow: system and documents used;
   e) Corroborating checks carried out, and QA/QC measures in general.

[to be further elaborated]

8.10 Verification of baseline data reports

All baseline data shall be verified by an independent and competent verifier. Guidelines for the verification process, competence requirements and accreditation guidelines beyond the existing ones[66] for EU ETS verifiers may need to be developed for this purpose.

8.10.1 Requirements for the verification process

[to be further elaborated:

Requirements to be defined may contain the following elements:

- *Strategic analysis*
- *Risk analysis*
- *Verification Plan*
- *Evaluating the baseline data methodology report*

[66] Existing guidelines are especially section 10.4 of Annex I of the MRG, and EA 6/03:2010 ("EA Document for Recognition of Verifiers under the EU ETS Directive", http://www.european-accreditation.org/n1/doc/EA6-03.pdf)

- *Process analysis*
- *How to handle data gaps and other misstatements*
- *Verification statement (template?)*

Reference to EA 6/03 should be made to the extent feasible.]

8.10.1 Requirements for Verifiers of baseline data reports

[to be further elaborated:

Accreditation standards to be used(?),

competence requirements (in addition to existing EA 6/05), other additions to EA 6/05]

9 NORMATIVE ANNEXES

9.1 Annex I: List of product benchmarks and description of system boundaries

No.	Product name	PRODCOM code	Product definition	CL exposure*	Definition of system boundaries

* according to Decision 2010/2/EU

[To be added as soon as available]

9.2 Annex II: List of product benchmarks to be used for the years 2013 to 2020

No.	Product name	Unit[67]	2013	2014	2015	2016	2017	2018	2019	2020

[To be added as soon as available]

[67] Unit refers to the "unit in which the product benchmark value is expressed", e.g. 1.28 EUA's per tonne of dry, 99.5% pure product sold.

9.3 Annex III: Standard Capacity Utilisation Factors

The Standard Capacity Utilisation Factor ($SCUF_i$) in sector *i* is defined as

$$SCUF = \frac{average\ \ full\ load\ \ hours\ \ per\ \ year\ \ in\ the\ \ Sector}{8760} \qquad \text{Equation 26}$$

That definition covers both aspects (and combinations thereof) of “capacity utilisation” (CU):

- A CU of 80% can mean that the installation is run 8760h per year at an average load of 80%, or
- CU = 80% can mean that the installation is run at full load, but only 7008 hours per year (i.e. 80% of 8760 hours).

Standard Capacity Utilisation Factors (SCUFs) for each sector (i.e. for each product benchmark) will be derived from the baseline data collection (see section 8), where the average capacity utilisation of each installation in the sector in the baseline period will be collected as follows:

$$CU = \frac{average\ \ production\ \ per\ \ year}{production\ \ possible\ \ with\ 8760\ full\ \ load\ \ hours} \qquad \text{Equation 27}$$

The SCUF can then be determined (by the Commission) as the average of all CU reported in the sector.

[Subject to further discussion]

It is an administrative difficulty that the SCUFs will be derived from the baseline data collection. That means that the SCUFs can only be determined after that data has been notified to the Commission, while the SCUFs would be needed already for the calculation of the NIM entries of installations which had a significant capacity increase during the baseline period. In order to solve that contradiction, it is proposed to introduce a “generic cross-sectoral” SCUF of *[80%]* for use in the NIMs. “Real” SCUFs for sectors based on baseline data will be used only for allocation to new entrants (i.e. for allocations granted after 30 September 2011). However, that would deviate from the principle that new entrants and incumbents should be treated equal (to the extent feasible).

9.4 Annex IV: Data needed for the calculation of free allocation

The following table is a summary of the baseline data to be reported by operators. Annual figures for each year of the baseline period for each parameter are to be filled in. Only fields relevant for the installation under consideration should be filled in.

[Section will be revised for alignment with changes made to the main text since version 1.00]

	Sub-inst. 1	Sub-inst. n	Total inst.	Remarks
Product name				as defined in annex section 9.1 (based on the sector rule book)
PRODCOM codes of product(s)				Identification to the same level of detail (number of digits) as in the CL list Decision
Production level (t per year)				
t CO_2(e) emitted				Direct emissions only. The distinction between fuel and process emissions is optional for products with benchmarks, if compatible with the sector rule book. Where the emissions can't be attributed directly to a sub-installation, the installation's overall emissions are given precisely, and the attribution to sub-installations with benchmarks is done by estimation based on best available data or expert judgement. The difference between the total emissions and the sum of all benchmark-related emissions is attributed to the fall-back sub-installation.
t CO_2 from fuels				
t CO_2(e) from processes				
Total energy input from fuels within the installation [TJ]				Calculated from amount of fuel times the net calorific value (NCV). If the attribution to sub-installation is difficult, the remarks made for emissions apply mutatis mutandis. All kinds of fuels are to be considered (including waste gases).
Measurable heat produced [TJ]				Only if not all emissions in the installation stem from benchmarked products, i.e. where fall-back approaches are to be applied
Energy input from fuels within the installation not used for production of measurable heat [TJ]				

	Sub-inst. 1	Sub-inst. n	Total inst.	Remarks
heat imported from other installations [TJ]				In most cases this information will only be available on installation level. However, where available, the data should be reported at sub-installation level in order to apply the correct CL status.
heat exported to other installations [TJ]				Installation level data will be sufficient
Electricity produced [MWh]				
Electricity exported (sold) [MWh]				
Electricity consumed [MWh]				Installation level data will be sufficient, unless a sub-installation belongs to a benchmark where the exchangeability of heat and electricity is relevant.
Waste gases imported [TJ NCV and t CO_2]				Installation level data will be sufficient
Waste gases exported to other installations [TJ NCV and t CO_2]				
t CO_2 transferred into installation as feedstock				
t CO_2 transferred out of installation as feedstock				
t CO_2 stored geologically				Probably not relevant before 2013

Note that for some special product benchmarks (especially those using the CWT approach) more detailed or additional data has to be reported.

9.5 Annex V: CWT definitions

The following table gives an overview on the CWT functions to be used for some of the product benchmarks, the CWT factors and the basis for throughputs to be used in equation 14 (section 4.14.3) and in equation 15 (section 4.14.5).

CWT function	**Definition/ Solomon process units**	**Basis (kt/a)[68]**	**CWT factor**
Atmospheric Crude Distillation	Mild Crude Unit, Standard Crude Unit	F	1.00
Vacuum Distillation	Mild Vacuum Fractionation, Standard Vacuum Column, Vacuum Fractionating Column Vacuum distillation factor also includes average energy and emissions for Heavy Feed Vacuum (HFV) unit. Since this is always in series with the MVU, HFV capacity is not counted separately.	F	0.85
Solvent Deasphalting	Conventional Solvent, Supercritical Solvent	F	2.45
Visbreaking	Atmospheric Residuum (w/o a Soaker Drum), Atmospheric Residuum (with a Soaker Drum), Vacuum Bottoms Feed (w/o a Soaker Drum), Vacuum Bottoms Feed (with a Soaker Drum) Visbreaking factor also includes average energy and emissions for Vacuum Flasher Column (VAC VFL) but capacity is not counted separately.	F	1.40
Thermal Cracking	Thermal cracking factor also includes average energy and emissions for Vacuum Flasher Column (VAC VFL) but capacity is not counted separately.	F	2.70
Delayed Coking	Delayed Coking	F	2.20
Fluid Coking	Fluid Coking	F	7.60
Flexicoking	Flexicoking	F	16.60
Coke Calcining	Vertical-Axis Hearth, Horizontal-Axis Rotary Kiln	P	12.75
Fluid Catalytic Cracking	Fluid Catalytic Cracking, Mild Residuum Catalytic Cracking, Residual Catalytic Cracking	F	5.50

[68] Basis for CWT factors: Fresh feed (F), Reactor feed (R, includes recycle), Product feed (P), Synthesis gas production for POX units (SG)

CWT function	**Definition/ Solomon process units**	**Basis (kt/a)[68]**	**CWT factor**
Other Catalytic Cracking	Houdry Catalytic Cracking, Thermofor Catalytic Cracking	F	4.10
Distillate / Gasoil Hydrocracking	Mild Hydrocracking, Severe Hydrocracking, Naphtha Hydrocracking	F	2.85
Residual Hydrocracking	H-Oil, LC-Fining™ and Hycon	F	3.75
Naphtha/Gasoline Hydrotreating	Benzene Saturation, Desulfurization of C4–C6 Feeds, Conventional Naphtha H/T, Diolefin to Olefin Saturation, Diolefin to Olefin Saturation of Alkylation Feed, FCC Gasoline hydrotreating with minimum octane loss, Olefinic Alkylation of Thio S, S-Zorb™ Process, Selective H/T of Pygas/Naphtha, Pygas/Naphtha Desulfurization, Selective H/T of Pygas/Naphtha Naphtha hydrotreating factor includes energy and emissions for Reactor for Selective H/T (NHYT/RXST) but capacity is not counted separately.	F	1.10
Kerosene/ Diesel Hydrotreating	Aromatic Saturation, Conventional H/T, Solvent aromatics hydrogenation, Conventional Distillate H/T, High Severity Distillate H/T, Ultra-High Severity H/T, Middle Distillate Dewaxing, S-Zorb™ Process, Selective Hydrotreating of Distillates	F	0.90
Residual Hydrotreating	Desulfurization of Atmospheric Residuum Desulfurization of Vacuum Residuum	F	1.55
VGO Hydrotreating	Hydrodesulphurisation/ denitrification, Hydrodesulphurisation	F	0.90
Hydrogen Production	Steam Methane Reforming, Steam Naphtha Reforming, Partial Oxidation Units of Light Feeds Factor for hydrogen production includes energy and emissions for purification (H2PURE), but capacity is not counted separately.	P	300.00
Catalytic Reforming	Continuous Regeneration, Cyclic, Semi-Regenerative, AROMAX	F	4.95
Alkylation	Alkylation with HF Acid, Alkylation with Sulfuric Acid, Polymerization C3 Olefin Feed, Polymerization C3/C4 Feed, Dimersol Factor for alkylation/polymerization includes energy and emissions for acid re-	P	7.25

CWT function	Definition/ Solomon process units	Basis (kt/a)[68]	CWT factor
	generation (ACID), but capacity is not counted separately.		
C4 Isomerisation	C4 Isomerisation Factor also includes energy and emissions related to average EU27 special fractionation (DIB) correlated with C4 isomerisation.	R	3.25
C5/C6 Isomerisation	C5/C6 Isomerisation Factor also includes energy and emissions related to average EU27 special fractionation (DIB) correlated with C5 isomerisation.	R	2.85
Oxygenate Production	MBTE Distillation Units, MTBE Extractive Units, ETBE, TAME, Isooctene Production	P	5.60
Propylene Production	Chemical Grade, Polymer grade	F	3.45
Asphalt Manufacture	Asphalt & Bitumen Manufacture Production figure should include Polymer-Modified Asphalt. CWT factor includes blowing	P	2.10
Polymer-Modified Asphalt Blending	Polymer-Modified Asphalt Blending	P	0.55
Sulphur Recovery	Sulphur Recovery Factor for sulfur recovery includes energy and emissions for tail gas recovery (TRU) and H_2S Springer Unit (U32), but capacity is not counted separately.	P	18.60
Aromatic Solvent Extraction	ASE: Extraction Distillation, ASE: Liquid/Liquid Extraction, ASE: Liq/Liq w/ Extr. Distillation CWT factor cover all feeds including Pygas after hydrotreatment. Pygas hydrotreating should be accounted under naphtha hydrotreatment.	F	5.25
Hydrodealkylation	Hydrodealkylation	F	2.45
TDP/ TDA	Toluene Disproportionation / Dealkylation	F	1.85
Cyclohexane production	Cyclohexane production	P	3.00
Xylene Isomerisation	Xylene Isomerisation	F	1.85
Paraxylene prodcution	Paraxylene Adsorption, Paraxylene Crystallization Factor also includes energy and emissions for Xylene Splitter and Orthoxylene Rerun	P	6.40

CWT function	**Definition/ Solomon process units**	**Basis (kt/a)[68]**	**CWT factor**
	Column.		
Metaxylene prodcu-tion	Metaxylene prodcution	P	11.10
Phtalic anhydride production	Phtalic anhydride production	P	14.40
Maleic anhydride production	Maleic anhydride production	P	20.80
Ethylbenzene pro-duction	Ethylbenzene production Factor also includes energy and emissions for Ethylbenzene distillation.	P	1.55
Cumene production	Cumene production	P	5.00
Phenol production	Phenol production	P	1.15
Lube solvent extrac-tion	Lube solvent extraction: Solvent is Furfural, Solvent is NMP, Solvent is Phenol, Solvent is SO2	F	2.10
Lube solvent dewax-ing	Lube solvent dewaxing: Solvent is Chloro-carbon, Solvent is MEK/Toluene, Solvent is MEK/MIBK, Solvent is propane	F	4.55
Catalytic Wax Isom-erisation	Catalytic Wax Isomerisation and Dewaxing, Selective Wax Cracking	F	1.60
Lube Hydrocracker	Lube Hydrocracker w/ Multi-Fraction Distil-lation, Lube Hydrocracker w/ Vacuum Stripper, Lube H/F w/ Vacuum Stripper, Lube H/T w/ Multi-Fraction Distillation, Lube H/T w/ Vacuum Stripper	F	2.50
Wax Deoiling	Wax Deoiling: Solvent is Chlorocarbon, Solvent is MEK/Toluene, Solvent is MEK/MIBK, Solvent is Propane	P	12.00
Lube/Wax Hy-drotreating	Lube H/F w/ Vacuum Stripper, Lube H/T w/ Multi-Fraction Distillation, Lube H/T w/ Vacuum Stripper, Wax H/F w/ Vacuum Stripper, Wax H/T w/ Multi-Fraction Distilla-tion, Wax H/T w/ Vacuum Stripper	F	1.15
Solvent Hydrotreating	Solvent Hydrotreating	F	1.25
Solvent Fractionation	Solvent Fractionation	F	0.90
Mol sieve for C10+ paraffins	Mol sieve for C10+ paraffins	P	1.85
Partial Oxidation of Residual Feeds (POX) for Fuel	POX Syngas for Fuel	SG	8.20

CWT function	Definition/ Solomon process units	Basis (kt/a)[68]	CWT factor
Partial Oxidation of Residual Feeds (POX) for Hydrogen or Methanol	POX Syngas for Hydrogen or Methanol, POX Syngas for Methanol Factor includes energy and emissions for CO Shift and H2 Purification (U71) but capacity is not counted separately.	SG	44.00
Methanol from syngas	Methanol	P	-36.20
Air Separation	Air Separation	P (MNm3 O2)	8.80
Fractionation of purchased NGL	Fractionation of purchased NGL	F	1.00
Flue gas treatment	DeSOx and deNOx	F (MNm3)	0.10
Treatment and Compression of Fuel Gas for Product Sales	Treatment and Compression of Fuel Gas for Sales	kW	0.15
Seawater Desalination	Seawater Desalination	P	1.15

Basis for CWT factors: Net fresh feed (F), Reactor feed (R, includes recycle), Product feed (P), Synthesis gas production for POX units (SG)

10 INFORMATIVE ANNEXES

10.1 Annex VII: More guidance on defining Sub-installations

10.1.1 Example

An installation is carrying out the following activities [69]:

- A kiln for cement clinker production – waste heat from the exhaust gas is feed to a district heating network;
- A cement grinding plant (which has a directly fired dryer for some raw materials);
- A kiln for lime production, in which during some months of the year magnesite is burnt.

Such plant would have to be split into the following sub-installations:

1. Cement clinker production (product benchmark),
2. lime production (product benchmark),
3. Fall-back approaches:
    a. Magnesite burning: Note that the split from the lime production is a temporary data disaggregation, not one in terms of technical production units. The activity magnesia burning leads to two types of emissions:
        i. fuel emissions,
        ii. process emissions (decomposition of carbonates).
    b. Fuel mix benchmark for the fuels used in the grinding plant;
    c. Heat benchmark for the district heating. Note that in this case – depending on the definitions in the sector rule book – three situations are possible:
        i. The sector rule book considers the use of the heat contained in the waste gases as normal practice in the sector – the heat would be part of the clinker benchmark, and no fall-back to be applied.
        ii. The rule book deducts an amount of emissions from the clinker-related emissions (e.g. based on a natural gas equivalent): The fall-back sub-installation would dispose of exactly this amount of emissions. Allocation for the district heating delivered would be based on the heat benchmark.

[69] The example is based on the current status (Mid-April 2010) of discussion regarding product benchmarks. The inclusion of parts of the installation such as the grinding plant follows the Commission's guidance paper on the Scope of the EU ETS from 2013 onwards.

iii. The rule book makes no special provisions for use of waste heat, as it is unusual in the sector. The sub-installation “fall-back” has no emissions, but gets allocation based on the heat benchmark.

Note that here all fall-back approaches related to magnesite burning and cement production would be in the category “exposed to significant risk of carbon leakage”, while the district heating would be non-exposed. Thus, district heating would constitute a separate sub-installation.

10.2 Annex VIII: The distinction between incumbents and new entrants (relevant at the start of the third trading period)

The revised ETS Directive provides sufficient legal clarity to distinguish incumbents and new entrants at the start of the third trading period. Article 3(h) specifies:

“'new entrant' means: any installation carrying out one or more of the activities indicated in Annex I, which has obtained a greenhouse gas emissions permit for the first time after 30 June 2011; [...]”

An installation carrying out activities indicated in the revised Annex I (and thus participating in the EU ETS from 2013 onwards) can face the following situations (where “the deadline” means 30 June 2011, and “obtaining a GHG emissions permit” means that criterion 2 as described in section 3.2 is fulfilled):

1. The installation was operating already in 2005, still operates on the deadline, and has been in the EU ETS in the 1st or 2nd trading period. It obviously has obtained a GHG emissions permit well before the deadline. It is to be treated as incumbent for the 3rd trading period.

2. An installation similar to case 1, but it performs in addition activities which will be included in the EU ETS only from 2013 onwards. If the new activity is considered in the MS concerned a separate installation and obtains a separate GHG emissions permit, see case 5. If the legislation in the MS concerned does not provide for issuing a separate GHG emissions permit for the new activity, the installation is to be treated as incumbent for all its activities under EU ETS for the 3rd trading period.

3. An installation has been considered a new entrant in the second trading period, and has been issued its (new or modified) GHG emissions permit before the deadline. It is considered an incumbent for the 3rd trading period.

4. An installation will obtain its GHG emissions permit for the first time after the deadline, but still before 31 December 2012. Such installation will be considered a new entrant in the 2nd trading period, and will be allocated 2nd phase allowances (dependent on the MS’s applicable rules, this may be subject to proven start-up of operation before 31 December 2012). The installation will be considered also as a (real) new entrant for the 3rd trading period (see case 6.c).

5. An installation to be included in the EU ETS only from 2013 onwards which has been operating before the deadline can be classified as "incumbent" and should be treated similar to installations under case 2. However, for being treated as incumbent, the installation has to obtain a GHG emissions permit before 30 June 2011.

6. An installation to be included in the EU ETS only from 2013 onwards which will have obtained a GHG emissions permit only after the deadline. Such installation will be considered a new entrant for the purpose of the NIMs for the time from 2013 onwards, no matter if it will have been operating already before the deadline. However, different situations may occur:

    a. If the installation has been operating already during (parts of) the baseline period, the allocation rules may be the same as for incumbents regarding historic activity levels. The differences to incumbents will be restricted to the fact that the allowances are to be taken from the new entrants reserve, and that the linear factor is to be applied.

    b. If the installation will have been operating before the deadline, but after the regular baseline period, the full allocation rules for new entrants (including substituting the historic activity levels) will be applicable.

    c. If the installation will start operation only after the deadline, rules for determining the "starting date of normal operation" (see section **6.2.2**) will be relevant. These installations are "real" new entrants, the full new entrants allocation rules will apply, and the starting date will decide about the partial amount of allocation in the first year of operation.

After the NIMs have been notified to the Commission, all installations obtaining a new GHG emissions permit (including those that are included pursuant to Article 24(1) and (2), will be automatically considered "real" new entrants.

As the timely issuance of GHG emissions permits is a relevant parameter, MS should set up an appropriate legal framework or incentives for installations to obtain GHG emissions permit before 30 June 2011. This may be a preliminary GHG emissions permit, as outlined in section 3.2.

10.3 Annex IX: Significant capacity extensions before and after 30 June 2011

Besides the distinction between incumbent installations and new entrants (which is mostly relevant at the start of a new trading period), the new entrants definition is also applicable to extensions of existing installations[70]. Article 3(h) defines in this regard:

[70] An extension of capacity can also lead to exceeding the threshold in Annex I to the Directive for the first time. In this case the whole installation is the new entrant, and the date at which the new capacity is reached would be considered the starting date of operation for the whole installation.

"'new entrant' means: [...] any installation carrying out one or more of the activities indicated in Annex I [...], which has had a significant extension after 30 June 2011, only in so far as this extension is concerned […]"

It implies that these installations may apply for additional allowances as "new entrant" when a significant extension after 30 June 2011 will take place, and only in so far as this extension is concerned. It also applies to "real new entrants": as an example, an installation that is regarded as a new entrant because of e.g. obtaining the GHG emissions permit on 10 January 2012, might significantly extend its installed capacity by 30 November 2017. Therefore it can apply for additional free allocation for this new capacity as a new entrant.

This immediately implies that any significant extension that has taken place before or on 30 June 2011 cannot be regarded as a new entrant, and cannot have access to allocation from the new entrants reserve. If significant capacity extensions before 30 June 2011 should be taken into account for allocation, this can be done within the harmonised allocation methods for incumbents by adaptation of the "historical activity levels" (see section 4.11.3). That implies also that in order to ensure equal treatment the same definition of "significant extension" should be applied when "historical activity levels" are corrected and when allocation is granted to new entrants because of significant extensions.

10.4 Annex X: Opt-in and exclusion of small emitters

10.4.1 Inclusion pursuant to Article 24 ("Opt-in")

Pursuant to Article 24(1), Member States may apply emission allowance trading to activities and to greenhouse gases which are not listed in Annex I, and thus are not covered by Annex I of the EU ETS Directive. For such "opt-in" the following situations can occur:

1. The inclusion has been decided before 30 June 2011 (assuming also that the installations concerned have been issued a GHG emissions permit by that date[71]): the installations concerned are treated as incumbents. The following sub-cases exist:

    a. The installations fall under the scope of the revised Directive: The installation is not considered as opt-in from 1 January 2013 onwards, but as "installation carrying out an activity listed in Annex I". This is the case e.g. for the installations producing nitric acid.

    b. The installations are still not carrying out an activity listed in Annex I, e.g. installations carrying out combustion activities with less than 20 MW rated thermal input. They are considered incumbents, but go on being "opt-in".

    In both cases the "normal" fully EU-wide harmonised allocation rules as set out in this paper (including baseline data collection requirements) are applied.

[71] At least a preliminary permit as outlined in section 3.2.

2. The inclusion has been decided after 30 June 2011 (the GHG permit has been obtained after that date): The installations are treated as new entrants.

   The MS which decides to include an installation has to propose an allocation methodology for the opt-in. Every opt-in needs the approval by the Commission (and by way of the Comitology procedure, also the consent of the other Member States). In the spirit of the Directive, any allocation rule should have the potential for being fully EU-wide harmonised, especially because the Commission may approve the same inclusion by other Member States by way of Article 24(2). Furthermore the Commission is required to take into account all relevant criteria, in particular the effects on the internal market, potential distortions of competition, the environmental integrity of the Community scheme and the reliability of the planned monitoring and reporting system. Thus it can be assumed, that the allocation rules laid down within this discussion paper will be considered appropriate also for opt-ins. However, for each activity opted-in it needs to be assessed if product benchmarks are available and applicable, or which fall-back approach would be most suitable.

10.4.2 Exclusion of small emitters pursuant to Article 27

Regarding small emitters, which a Member State may wish to exclude from the ETS pursuant to Article 27, the Member State has to calculate appropriate allocation values for the purpose of the NIMs. This is because

- the Commission might reject the proposed exclusion,
- the installation might at a later stage be re-introduced in the EU ETS, and the appropriate allocation value pursuant to Article 10a (i.e. calculated pursuant to these allocation rules) has to be allocated from the year of re-introduction (see Article 27(2), second sub-paragraph).

However, if the exclusion concerns installations which have not been included in the EU ETS during the period from 2008 to 2012, simplified monitoring requirements may be applied according to Article 27(4). Although this paragraph only refers to emissions data, for the purpose of reducing administrative burden it is proposed to apply such less stringent monitoring requirements to all baseline data of installations to be excluded.

Article 27 implicitly presupposes that installations excluded are still required to monitor and report their emissions. Consequently, footnote 2 of the guidance paper on the scope of the EU ETS from 2013 states: "*For small emitters excluded from the EU ETS pursuant to Article 27, and in order to ensure that monitoring and reporting arrangements in accordance with Article 14 still apply for those installations, a Member State may also require that small emitters hold a GHG emissions permit, even when excluded from the EU ETS.*"

However, further details have to be defined by the Member State, and are thus not within the scope of these draft allocation rules. Due to the reference to Article 14, the rules for monitoring, reporting and verification of excluded installations will be included in the Regulations to be adopted pursuant to Articles 14 and 15 of the ETS Directive, which should then serve as blueprints for the Member States' individual MRV rules.

If in year *n* an installation exceeds the threshold for exclusion (25 000 tonnes of CO_2(e) per year), this will be reported in year *n+1* and the installation is re-introduced in the EU ETS as of 1 January of the year *n+1*.

The competent authority of the MS shall then allocate allowances as calculated for the purpose of the NIMs (and adjusted for any later significant capacity increase if relevant) for the year *n+1* and suspend equivalent measures as referred to in Article 27 of the Directive in the year *n+1*. Finally, by 30 April of the year *n+2*, the installation will have to surrender allowances for emissions in the year *n+1*.

Example:

1) installation that was exluded as small emitter emits 30 ktons of CO_2(e) in year 2015, which makes it not eligible anymore to be excluded;
2) the reporting of the 2015 emissions by the operator to the CA will happen before 31 March 2016;
3) the CA makes sure that the installation is "reintroduced" in the EU ETS as from 1 January 2016 (i.e. the surrendering obligation for the year 2017 is "added" again): allowances are allocated for the year 2016 and equivalent measures as referred to in Article 27 of the Directive are suspended for the year 2016);
4) the reporting of the 2016 emissions by the operator to the CA will happen before 31 March 2017;
5) the first surrendering obligation by the operator concerned is 30 April 2017.

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