



EUROPEAN COMMISSION

Version of 25 October 2010

Brussels, xxx
C(20..) yyy final

Draft

COMMISSION DECISION

of [...]

determining transitional Union-wide rules for the harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC

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COMMISSION DECISION

of

on determining transitional Union-wide rules for harmonised free allocation pursuant to Article 10a of Directive 2003/87/EC

THE EUROPEAN COMMISSION,

Having regard to the Treaty of the Functioning of the European Union,

Having regard to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, and in particular Article 10a thereof,

Whereas:

- (1) Article 10a of the Directive requires that the measures should, to the extent feasible, determine Union-wide ex-ante benchmarks so as to ensure that the free allocation of emission allowances takes place in a manner that provides incentives for reductions in greenhouse gas emissions and energy efficient techniques, by taking account of the most efficient techniques, substitutes, alternative production processes, high efficiency cogeneration, efficient energy recovery of waste gases, use of biomass and capture and storage of carbon dioxide, where such facilities are available, and should not provide incentives to increase emissions. Allocations must be fixed prior to the trading period so as to enable the market to function properly.
- (2) In defining the principles for setting ex-ante benchmarks in individual sectors or sub-sectors, the starting point should be the average performance of the 10 % most efficient installations in a sector or sub-sector in the EU in the years 2007-2008. The benchmarks should be calculated for products rather than for inputs, in order to maximise greenhouse gas emissions reductions and energy efficiency savings throughout each production process of the sector or the sub-sector concerned.
- (3) In order to establish the benchmarks, the Commission has consulted the relevant stakeholders, including the sectors and sub-sectors concerned. Information necessary for setting the benchmarks, installation data on the production, emissions and energy use, was collected as of February 2009 from industry associations, Member States, publicly and commercially available sources and through a survey asking installations to participate.
- (4) To the extent feasible, the Commission has developed benchmarks for products, as well as intermediate products that are traded between installations, produced from activities listed in Annex I to Directive 2003/87/EC. In principle, for each product one

benchmark should be defined. Where a product is a direct substitute of another product, both should be covered by the same product benchmark and the related product definition.

- (5) The Commission considered that setting a benchmark for a product was feasible where, taking into account the complexity of the production processes, product definitions and classifications were available that allow for verification of production data and a uniform application of the product benchmark across the Union for the purposes of allocating emission allowances. No differentiation was made on the basis of geography or on the basis of technologies, raw materials or fuels used, so as not to distort comparative advantages in carbon efficiency across the Union economy, and to enhance harmonisation of the transitional free allocation of emission allowances.
- (6) The benchmark values should cover all production-related direct emissions, including emissions related to the production of measurable heat used for production, regardless of whether the measurable heat was produced on-site or by another installation. Emissions related to the production of electricity and to the export of measurable heat, including avoided emissions of alternative heat or electricity production in cases of exothermic processes or the production of electricity without direct emissions, were excluded when setting the benchmark values. In case the exclusion of emissions related to the export of measurable heat was not feasible, this heat should not be eligible for the free allocation of emission allowances.
- (7) In order to ensure that benchmarks lead to reductions in greenhouse gas emissions, some production processes in which direct emissions eligible for the free allocation of emission allowances and indirect emissions from electricity production and not eligible for free allocation on the basis of Directive 2003/87/EC are to a certain extent interchangeable, the total emissions including indirect emissions related to the production of electricity have been considered for the determination of the benchmark values to ensure a level playing field for fuel and electro-intensive installations. For the purpose of the allocation of emission allowances on the basis of the benchmarks concerned, only the share of the direct emissions in the total emissions should be taken into account in order to avoid providing free allocation of emission allowances for emissions related to electricity.
- (8) For the determination of benchmark values, the Commission has used as a starting point the arithmetic average of the greenhouse gas performance of the 10% most greenhouse gas efficient installations in 2007 and 2008 for which data has been collected. In addition, the Commission has in accordance with Article 10a(1) of Directive 2003/87/EC analysed for all sectors for which a product benchmark is provided for in Annex I, , on the basis of additional information received from several sources and on the basis of a dedicated study analysing most efficient techniques and reduction potentials at European and international level, whether these starting points sufficiently reflect the most efficient techniques, substitutes, alternative production processes, high efficiency cogeneration, efficient energy recovery of waste gases, use of biomass and capture and storage of carbon dioxide, where such facilities are available. Data used for determining the benchmark values has been collected from a wide range of sources in order to cover a maximum of installations producing a benchmarked product in the years 2007 and 2008. First, data on the greenhouse gas performance of ETS installations producing benchmarked products has been collected by or on behalf of the respective European sector associations based on defined rules,

so-called 'sector rule books'. As reference for these rule books, the Commission provided guidance on quality and verification criteria for benchmarking data for the EU-ETS. Second, to complement the data collection by European sector associations, consultants on behalf of the European Commission collected data from installations not covered by industry's data and also competent authorities of Member States provided data and analyses.

- (9) To ensure that the benchmark values are based on correct and compliant data, the Commission, supported by consultants, carried out in-depth compliance checks of the sector rule books as well as plausibility checks of the starting point values derived from the data. As indicated in the guidance on quality and verification, data has been verified to the extent necessary by independent verifiers.
- (10) Where several products are produced in one installation and an assignment of emissions to the individual products has not been regarded feasible, only single product installations have been covered by the data collection and included in the benchmark setting. This concerns the product benchmarks for lime, dolime, bottles and jars of colourless glass, bottles and jars of coloured glass, facing bricks, pavers, spray-dried powder, uncoated fine paper, tissue, testliner and fluting, uncoated carton board as well as coated carton board. To increase the significance and check the plausibility of the results, the values for the average performance of the 10% most efficient installations have been compared against literature on most efficient techniques.
- (11) In case no data or no data collected in compliance with the benchmarking methodology has been available, information on present levels of emissions and consumptions and on most efficient techniques, mainly derived from the Reference Documents on Best Available Techniques (BREF) established in accordance with Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control¹ has been used to derive benchmark values. In particular, due to a lack of data on the treatment of waste gases, heat exports and electricity production, the values for the product benchmarks for coke and hot metal have been derived from calculations of direct and indirect emissions based on information on relevant energy flows provided by the relevant BREF and default emission factors set out in Commission Decision 2007/589/EC of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council². For the product benchmark for sintered ore, data has also been corrected based on relevant energy flows provided by the relevant BREF, taking into account the combustion of waste gases in the sector.
- (12) Where deriving a product benchmark was not feasible, but greenhouse gases eligible for the free allocation of emission allowances occur, those allowances should be allocated on the basis of generic fallback approaches. A hierarchy of three fallback approaches has been developed in order to maximise greenhouse gas emission reductions and energy savings for at least parts of the production processes concerned. The heat benchmark is applicable for combustion processes where a measurable heat

¹ OJ L 24, 29.1.2008, p. 8.

² OJ L 229, 31.08.2007, p. 1.

carrier is used. The fuel benchmark is applicable where non-measurable heat is consumed. The heat and fuel benchmark values have been derived based upon the principles of transparency and simplicity, using the reference efficiency of a widely available fuel that can be regarded as second-best in terms of greenhouse gas efficiency, considering energy efficient techniques. For process emissions, emission allowances should be allocated on the basis of historical emissions. In order to ensure that the free allocation of emission allowances for such emissions provides sufficient incentives for reductions in greenhouse gas emissions and to avoid any difference in treatment of process emissions allocated on the basis of historical emissions and those within the system boundaries of a product benchmark, the historical activity level of each installation should be multiplied by a factor equal to 0.9700 to determine the number of free emission allowances..

- (13) From 2013 onwards, all free allocations pursuant to Article 10a of Directive 2003/87/EC should be done in accordance with these rules. To give effect to the transitional system provided for by Article 10a(11) of Directive 2003/87/EC, according to which the free allocation of emission allowances should decrease from 80 % of the amount that corresponded to the allowances to be allocated in 2013 to 30% of this amount with a view to reaching no free allocation in 2027, the factors set out in Annex VI apply. Where a sector or sub-sector has been put on the list determined by 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 leakage³, these factor do not apply. Allocations under this Decision will be taken into account in determining future lists of sectors or sub-sectors deemed to be exposed to a significant risk of carbon leakage.
- (14) To facilitate the data collection from operators and the calculation of the emission allowances to be allocated by Member States, each installation should be divided into sub-installations where required. Member States should ensure that emissions are correctly assigned to the relevant sub-installations and that there are no overlaps between sub-installations.
- (15) Member States should ensure that data collected from the operators and used for allocation purposes is complete, consistent and presents the highest achievable accuracy. It should be verified by an independent verifier so as to ensure that the free allocation of emission allowances is based on solid and reliable data. This decision should provide for specific minimum requirements for data collection and verification to facilitate a harmonised and consistent application of the allocation rules.
- (16) The amount of allowances to be allocated free of charge to incumbent installations should be based on historical production data. In order to ensure that the reference period is as far as possible representative of industry cycles, covers a relevant period where good quality data is available and reduces the impact of special circumstances, such as temporary closure of installations, the historical activity levels have been based on the median production during the period from 1 January 2005 to 31 December 2008, or, where it is higher, on the median production during the period from 1 January 2009 to 31 December 2010. It is also appropriate to take account of

³ OJ L 1, 5.1.2010, p. 10.

any significant capacity change that has taken place in the relevant period. For new entrants, the determination of activity levels should be based on standard or installation-specific capacity utilisation.

- (17) The information collected by Member States should facilitate the application of this Decision by competent authorities and by the Commission.
- (18) In order to avoid any distortion of competition and to ensure an orderly functioning of the carbon market, Member States should ensure that no double allocation takes place. In this context, Member States should pay particular attention to cases where a benchmarked product is produced in more than one installation, where more than one benchmarked product is produced in the same installation or where intermediate products are exchanged across installation boundaries.
- (19) To ensure that the emissions trading system delivers reductions over time, Directive 2003/87/EC provides for the Union-wide quantity of allowances to decrease in a linear manner. As this decreasing Union-wide quantity is taken into account for determining the maximum annual amount of allowances pursuant to Article 10a(5) of Directive 2003/87/EC, all free emission allowances allocated on the basis of this Decision to installations not covered by this maximum annual amount referred to in Article 10a(5) should be adjusted in the same linear manner as the Union-wide quantity of allowances, using the year 2013 as a reference.
- (20) The uniform cross-sectoral correction factor that is applicable in each year of the period from 2013 to 2020 to installations that are not identified as electricity generators, and that are not new entrants, pursuant to Article 10a(5) of Directive 2003/87/EC, should be determined on the basis of the preliminary total annual amount of emission allowances allocated free of charge over the period from 2013 to 2020 calculated for these installations pursuant to this Decision, including the installations that might be excluded according to Article 27 of that Directive. This amount of free emission allowances allocated in each year of the period should be compared with the annual amount of allowances that is calculated in accordance with Article 10a(5) of Directive 2003/87/EC for installations that are not electricity generator or new entrants, taking into account the relevant share of the annual Community-wide total quantity, as determined pursuant to Article 9 of that Directive, and the relevant amount of emissions that are only included in the Union scheme from 2013 onwards.
- (21) Where measurable heat is exchanged between two or more installations, the free allocation of emission allowances should be based on the heat consumption of an installation and take account of the risk of carbon leakage. Thus, to ensure that the number of free emission allowances to be allocated is independent from the heat supply structure, emission allowances should be allocated to the heat consumer.
- (22) To enhance the significance of the available data on the greenhouse gas performance of the installations covered by the Union scheme, the product benchmarks for sulphite pulp, thermo-mechanical pulp and mechanical pulp as well as for recovered paper are based on BREF information on most efficient techniques reflecting the use of fossil start-up fuels, the use of fossil fuels (for sulphite pulp, thermo-mechanical and mechanical pulp) and of thermal energy (for recovered paper). The product benchmark for newsprint has also been based on most efficient techniques reflecting the use of thermal energy to derive a significant benchmark value.

- (23) In order to take account of additional greenhouse gas emissions not reflected in the data for determining the benchmark values for some installations and to ensure that the allocation of free emission allowances on the basis of the product benchmark does not provide incentives to increase emissions, the individual data points of the installations on the benchmark curve for nitric acid have been corrected on the basis of information on the average of these emissions provided by industry and of information derived from the BREF. The product benchmark for nitric acid reflects this correction.
- (24) For grey cement clinker, a concrete and largely unexploited potential to reduce specific emissions could be sufficiently substantiated through further analyses of existing techniques and industry practices. In order to ensure that emission allowances are allocated in a manner that provides incentives for reduction of greenhouse gas emissions by taking into account, inter alia, most efficient techniques and substitutes in accordance with Article 10a(1) of Directive 2003/87/EC, the allocation of free emission allowances for grey cement clinker should reflect the sector's ability to improve the greenhouse gas efficiency through clinker substitution by taking into account the historical clinker-to-cement ratio of the baseline period.
- (25) In order to take into account differences in refinery configurations, the product benchmark for the refinery sector should be based on the "CO₂ weighted tonne" (hereinafter "CWT") approach. Thereby the single product of the refinery is the CWT and its production has been calculated on the basis of defined generic process units each of which has been weighted with an emission factor relative to crude distillation, denoted as the CWT factor and representative of the CO₂ emission intensity at an average level of energy efficiency, for the same standard fuel type for each process unit for combustion, and for average process emissions of the process unit. On this basis, the data points used for setting the product benchmark have been derived by comparing the actual emissions to the total CWT of each refinery. The free allocation of emission allowances to refineries is then corrected to exclude electricity use and production in order to be consistent with Art. 10a(1) of Directive 2003/87/EC.
- (26) Given the wide range of product qualities that can be achieved, the product benchmarks for lime and dolime refer to a standard composition concerning calcium oxide and magnesium oxide. Regarding combustion emissions data for specific combustion emissions of the production of these standard products has been used based on Decision 2007/589/EC.
- (27) Whereas the ammonia and soda ash benchmarks assume that all CO₂ resulting from the processes is emitted to the atmosphere, emissions should be monitored and reported in accordance with the regulation for the monitoring and reporting of emissions from the activities listed in Annex I, to be adopted by 31 December 2011 pursuant to Article 14(1) of Directive 2003/87/EC, assuming that all CO₂ produced during the production processes of ammonia and soda ash was emitted to the atmosphere.
- (28) The steam cracking benchmark does not cover the so-called supplementary feed, high value chemicals that are not produced in the main process as well as the related emissions, but, where applicable, supplementary feed should be considered for the free allocation of emission allowances using specific emission factors.

- (29) In order to ensure a level playing field for the production of aromatics in refineries and in chemical plants, the free allocation of emission allowances for aromatics should be based on the CWT approach and the benchmark value of the refineries product benchmark should be applied.
- (30) Considering that in the production of vinyl chloride monomer, hydrogen is used to some extent as fuel substituting conventional fuels such as natural gas, thus reducing the direct emissions of the combusting process, but considering also the very high greenhouse gas intensity of the hydrogen production, the vinyl chloride monomer benchmark accounts for the fuel use of hydrogen as if it was natural gas.
- (31) In order to ensure a level playing field for the production of hydrogen and synthesis gas in refineries and in chemical plants, the benchmark for these products should be based on the CWT approach and the benchmark value of the refineries benchmark. Both product benchmarks refer to a defined volumetric concentration of hydrogen.
- (32) Given that full auctioning should be the rule from 2013 onwards for the power sector, taking into account its ability to pass on the increased cost of carbon dioxide, and that no free allocation should be made in respect of any electricity production, except for transitional free allocation for the modernisation of electricity generation and electricity produced from waste gases, this Decision should not cover the free allocation of emission allowances related to the production or consumption of electricity. Nevertheless, according to Article 10a(6) of Directive 2003/87/EC, sectors or subsectors determined to be exposed to a significant risk of carbon leakage may be compensated for costs related to greenhouse gas emissions passed on in electricity prices by financial measures adopted by Member States in accordance with state aid rules applicable and to be adopted by the Commission in this area.
- (33) It is also appropriate that the product benchmarks take account of the efficient energy recovery of waste gases and emissions related to their use. To this end, for the determination of the benchmark values for products of which the production generates waste gases, the carbon content of these waste gases has been taken into account to a large extent. Where waste gases are exported from the production process outside the system boundaries of the relevant product benchmark and combusted for the production of heat outside the system boundaries of a benchmarked process as defined in Annex I, related emissions should be taken into account by means of allocating additional emission allowances on the basis of the heat or fuel benchmark. In the light of the general principle that no emission allowances should be allocated for free in respect of any electricity production, to avoid undue distortions of competition on the markets for electricity supplied to industrial installations and taking into account the inherent carbon price in electricity, it is appropriate that, where waste gases are exported from the production process outside the system boundaries of the relevant product benchmark and combusted for the production of electricity, no additional allowances are allocated beyond the share of the carbon content of the waste gas accounted for in the relevant product benchmark.
- (34) The product benchmarks also take account of the historical emissions from flaring of waste gases related to the production of a given product and fuel used for safety flaring should be considered fuel used for the production of non-measurable heat in order to take account of the compulsory nature of these flares.

- (35) Substantial investment efforts are necessary to combat climate change and to reduce the carbon intensity of economies. This Decision should therefore be applied in a manner to foster investment in clean technologies in each sector and sub-sector. In accordance with Directive 2003/87/EC, other policies and measures may in the future supplement this goal and encourage the effective use of allowances in order to generate substantial investments in more energy-efficient technologies. In particular, if the final annual amount of allowances allocated free of charge for all incumbent installations determined in accordance with this Decision falls significantly below the maximum annual amount of allowances referred to in Article 10a(5) of Directive 2003/87/EC, an amendment to this Decision could provide incentives for further reductions in greenhouse gas emissions in accordance with Article 10a(1) of Directive 2003/87/EC by allocating allowances to installations capable of implementing innovative technologies that further reduce greenhouse gas emissions.
- (36) Investments in significant capacity extensions giving access to the reserve for new entrants provided for in Article 10a(7) of Directive 2003/87/EC should be unambiguous and of a certain scale in order to avoid an early depletion of the reserve of emission allowances created for new entrants, to avoid distortions of competition, to avoid any undue administrative burden and to ensure equal treatment of installations across Member States. It should, in particular, be made sure that small and medium-sized installations covered by the emissions trading scheme, small emitters and new entrants carrying out an activity listed in Annex I for the first time also have full, fair and equitable access to the free emission allowances in the reserve. It is therefore appropriate to define the threshold for a significant capacity change by 15% of the installation's installed capacity and require that the change in the installed capacity triggers a significantly higher or lower activity level of the installation concerned. However, incremental capacity extensions or reductions should be taken into account when assessing whether this threshold is reached.
- (37) To ensure that no emission allowances are allocated free of charge to an installation that has ceased its operations, this Decision should provide for measures defining such installations and prohibiting the issuance of allowances, unless it can be established that the installation will resume its operations within a specified and reasonable amount of time.
- (38) In order to adapt the number of emission allowances to be allocated to an installation having partially ceased operations, specific thresholds comparing the reduced activity level to the initial activity level have been defined. The number of emission allowances to be allocated should then be adjusted accordingly as of the year following the year during which the installation partially ceased operations. Where such an installation again reaches an activity level above the thresholds, the initial number of emission allowances to be allocated should be partly or even fully be reinstated depending of the installation's level of operation.
- (39) Where applicable, account has been taken of the guidance on interpretation of Annex I of the Directive 2003/87/EC.
- (40) The measures provided for in this Decision are in accordance with the opinion of the Climate Change Committee,

HAS ADOPTED THIS DECISION:

CHAPTER I

GENERAL PROVISIONS

Article 1

Subject matter

This Decision lays down transitional Union-wide rules for the harmonised free allocation of emission allowances under Directive 2003/87/EC from 2013 onwards.

Article 2

Scope

This Decision shall apply to the free allocation of emission allowances under Chapter III (stationary installations) of Directive 2003/87/EC in trading periods from 2013 with the exception of transitional free allocation of emission allowances for the modernisation of electricity generation pursuant to Article 10c of Directive 2003/87/EC.

Article 3

Definitions

1. For the purposes of this Decision, the following definitions shall apply:
 - (a) 'incumbent installation' means any installation carrying out one or more activities listed in Annex I of Directive 2003/87/EC or an activity included in the Union scheme for the first time in accordance with Article 24 of that Directive which

obtained a greenhouse gas emission permit before 30 June 2011 or,

is in fact operating, obtained a permit provided for in Directive 2008/1/EC and all other relevant environmental permits by 30 June 2011 and fulfilled by 30 June 2011 all other criteria defined in the national legal order of the Member State concerned on the basis of which the installation would have been entitled to receive the greenhouse gas permit.
 - (b) 'product benchmark sub-installation' means inputs, outputs and corresponding emissions relating to the production of a product for which a benchmark has been set in Annex I;
 - (c) 'heat benchmark sub-installation' means inputs, outputs and corresponding emissions not covered by a product benchmark sub-installation relating to the import or production of measurable heat which is consumed for the production

of products or for the production of mechanical energy, heating or cooling within the installation's boundaries;

- (d) 'fuel benchmark sub-installation' means inputs, outputs and corresponding emissions not covered by a product benchmark sub-installation relating to the production of non-measurable heat consumed for the production of products or for the production of mechanical energy by fuel combustion, including safety flaring;
- (e) 'measurable heat' means a heat flow transported through identifiable pipelines or ducts using a heat transfer medium, such as, in particular, steam, hot air, water, oil, liquid metals and salts, for which a heat meter within the meaning of Annex MI-004 of Directive 2004/22/EC of the European Parliament and of the Council⁴ is or could be installed;
- (f) 'non-measurable heat' means all heat other than measurable heat;
- (g) 'process emissions sub-installation' means greenhouse gas emissions other than carbon dioxide listed in Annex I of Directive 2003/87/EC which occur outside the system boundaries of a product benchmark listed in Annex I or carbon dioxide emissions which occur outside the system boundaries of a product benchmark listed in Annex I as a result of any of the following:
 - the chemical or electrolytic reduction of metal ores;
 - the removal of impurities from metals;
 - the thermal decomposition of carbonates;
 - organic chemical syntheses excluding the production of heat;
 - the use of specific hydrocarbons for stoichiometry purpose to avoid undesirable side reactions;
- (h) 'capacity' means the production capability of the installation or sub-installation, including the import of measurable heat, with its equipment and configuration if it is operated at full load 24 hours per day for 365 days a year;
- (i) 'significant capacity extension' means a significant increase in a sub-installation's capacity whereby all of the following occur:
 - one or more identifiable physical changes relating to its technical configuration and functioning other than the mere replacement of an existing production line take place,
 - the sub-installation may be operated at a capacity that is at least 15% higher compared to the installed capacity of the sub-installation before the change,

⁴ OJ L 135, 30.4.2004, p. 1.

a significantly higher activity level of the sub-installation is achieved, resulting in an additional allocation of emission allowances for the sub-installation, to which the physical changes relate, of more than 500 allowances per year;

- (j) 'significant capacity reduction' means a significant decrease in a sub-installation's capacity of the magnitude considered to constitute a significant capacity extension;
- (k) 'significant capacity change' means either a significant capacity extension or a significant capacity reduction;
- (l) 'added capacity' means the difference between the installed capacity of an installation or sub-installation determined pursuant to Article 9 and the capacity of that same installation or sub-installation after having had a significant extension;
- (m) 'reduced capacity' means the difference between the installed capacity of an installation or sub-installation pursuant to Article 9 and the capacity of that same installation or sub-installation after having had a significant capacity reduction;
- (n) 'start of normal operation' means the verified and approved first day of a continuous 30-day period, or, where the usual production cycle in the sector concerned does not foresee continuous production, the first day of a 30-day period split in sector-specific production cycles, during which the installation operates at least at 40% of its capacity;
- (o) 'safety flaring' means the combustion of highly fluctuating amounts of process or residual gases in a unit open to atmospheric disturbances which is explicitly required for safety reasons by relevant permits for the installation;
- (p) 'verifier' means a competent, independent, accredited verification body or person with responsibility for performing and reporting on the verification process, in accordance with the detailed requirements established by the Member State pursuant to Annex V of Directive 2003/87/EC.

Article 4

Competent authority and rounding

1. Member States shall make the appropriate administrative arrangements, including designation of the competent authority or authorities in accordance with Article 18 of Directive 2003/87/EC, for the implementation of the rules of this Decision.
2. All calculations relating to a number of allowances carried out in accordance with this Decision shall be rounded up to the nearest allowance.

CHAPTER II

INCUMBENT INSTALLATIONS

Article 5

Identification of installations

1. Each Member State shall identify all installations in its territory and eligible for free allocation under Article 10a of Directive 2003/87/EC.
2. Each Member State shall also identify all heat producing electricity generators and small installations, which may be excluded from the Union scheme pursuant to Article 27 of Directive 2003/87/EC.

Article 6

Division into sub-installations

1. For the purposes of this Decision, Member States shall divide each installation eligible for the free allocation of emission allowances under Article 10a of Directive 2003/87/EC into one or more of the following sub-installations, as required:
 - (a) a product benchmark sub-installation;
 - (q) a heat benchmark sub-installation;
 - (r) a fuel benchmark sub-installation;
 - (s) a process emissions sub-installation

Sub-installations shall correspond, to the extent possible, to physical parts of the installation.

For heat benchmark sub-installations, fuel benchmark sub-installations and process emissions sub-installations, Member States shall clearly distinguish on the basis of NACE and Prodcom codes between whether or not the relevant process serves a sector or subsector exposed to a significant risk of carbon leakage as determined by Commission Decision 2010/2/EU.

2. The sum of the emissions of each sub-installation shall not exceed the total emissions of the installation.

Article 7

Baseline data collection

1. For each incumbent installation eligible for the free allocation of emission allowances under Article 10a of Directive 2003/87/EC, including installations that are operated only occasionally, in particular, installations that are kept in reserve or on standby and installations operating on a seasonal schedule, Member States shall, for all years of the period from 1 January 2005 to 31 December 2008, or 1 January 2005 to 31 December 2010 where necessary, during which the installation has been operating, collect from the operator all relevant information and data regarding each parameter listed in Annex IV.
2. Member States shall collect data for each sub-installation separately. If necessary, Member States shall require the operator to submit more data.

Where 95% of the outputs of the heat benchmark sub-installation, of the fuel benchmark sub-installation or of the process emissions sub-installation, serve sectors or subsectors deemed to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU or serve sectors or subsectors not deemed to be exposed to a significant risk of carbon leakage, Member States may exempt the operator from providing data allowing for the distinction in terms of carbon leakage exposure.

3. Member States shall obtain, record and document data in a manner that enables an appropriate use of it by the competent authority.

Member States may require the operator to use an electronic template or specify a file format for submission of the data. However, it shall accept an operator's use of any electronic template or file format specification published by the Commission for the purpose of data collection under this article, unless the Member State's template or file format specification requires at least input of the same data.

4. Inputs, outputs and corresponding emissions for which only data for the installation as a whole is available, shall be proportionally attributed to the relevant sub-installations, based on the following factors:
 - (a) sequentially based on the usage time per year for each-sub-installation;
 - (b) where it is not possible to use the factor referred to in point (a), the mass or volume of individual products produced or estimates based on the ratio of free reaction enthalpies of the chemical reactions involved.

5. Member States shall require operators to submit complete and consistent data. Member States shall, in particular, ensure that operators exercise due diligence and submit data that presents highest achievable accuracy.

To this end, Member States shall ensure that each operator also submits a methodology report containing, in particular, a description of the installation, the compilation methodology applied, different data sources, calculation steps and, where applicable, assumptions made and the methodology applied to attribute emissions to the relevant sub-installations in accordance with paragraph 4. It may order the operator to demonstrate the accuracy and completeness of the data provided.

6. Where data is missing, Member States shall require the operator to duly justify any lack of data.

Member States shall require the operator to substitute all missing data with conservative estimates, in particular, based on best industry practice, recent scientific and technical knowledge before or, at the latest, during verification by the verifier.

Where data is partly available, conservative estimate means that the value used shall be not more than 90% of the value obtained by using the data available.

Where no data on measurable heat flows for the heat benchmark sub-installation is available, a proxy value may be derived from the corresponding energy input multiplied by the efficiency of the heat production as measured and verified by a verifier. In case no such efficiency data is available, a reference efficiency of 70% shall be applied.

7. Each Member State shall make the data collected on the basis of paragraph 1 to 6 available to the Commission.

Article 8

Verification

1. In the process of collecting data in accordance with Article 7, Member States shall only accept data that has been verified as satisfactory by a verifier. The verification process shall relate to the methodology report and the reported parameters referred to in this Article 7 and 19 and Annexes IV and V. The verification shall address the reliability, credibility and accuracy of the data provided by the operator.
2. Member States shall ensure that the verifier is independent of the operator, carries out his activities in a sound and objective professional manner, and understands each of the following:
 - (a) the provisions of this Decision, as well as relevant standards and guidance;
 - (t) the legislative, regulatory, and administrative requirements relevant to the activities being verified;
 - (u) the generation of all information related to each parameter or source of emissions in the installation, in particular, relating to the collection, measurement, calculation and reporting of the data.
3. In addition to the requirements set out in Decision 2007/589/EC, Member States shall ensure that all of the following minimum requirements are met:
 - (a) the verifier has planned and performed the verification with an attitude of professional scepticism recognizing that circumstances may exist that cause the information contained in the reports to be materially misstated;
 - (b) the verifier has only validated reported parameters where reliable and credible data and information allowed the parameters to be determined with a high

degree of certainty. A high degree of certainty requires the operator to show that:

- the reported parameters are free of inconsistencies;
 - the collection of the parameters has been carried out in accordance with applicable standards or guidance;
 - the relevant records of the installation are complete and consistent.
- (c) the verifier has based the verification on a strategic analysis of all relevant activities carried out in the installation and have an overview of all the activities and their significance for allocation purposes;
- (d) the verifier has analysed the inherent risks and control risks related to the scope and complexity of the operator's activities and allocation parameters, and which could lead to a material misstatements and non-conformities and to draw up a verification plan following this risk analysis;
- (e) the verifier has conducted a site visit, when appropriate, to inspect the operation of meters and monitoring systems, conduct interviews, and collect sufficient information and evidence;
- (f) has carried out the verification plan by gathering data in accordance with the defined sampling methods, walkthrough tests, document reviews, analytical procedures and data review procedures, including any relevant additional evidence, upon which the verifier's verification opinion will be based;
- (g) has requested the operator to provide any missing data or complete missing sections of audit trails, explain variations in parameters or emissions data, or revise calculations, or adjust reported data;
- (h) has prepared an internal verification report. The verification report shall record evidence showing that the strategic analysis, the risk analysis and the verification plan has been performed in full, and provide sufficient information to support verification opinions. The internal verification report shall as well facilitate a potential evaluation of the audit by the competent authority, and accreditation body.
- (i) has made a judgment with respect to whether the reported parameters contain any material misstatement as compared to a materiality threshold to be defined, and whether there are material non-conformities or other issues relevant for the verification opinion based on the findings contained in the internal verification report;
- (j) has presented the verification methodology, his findings and verification opinion in a verification report, addressed to the operator, to be submitted by the operator with the methodology report and the reported parameters to the competent authority.

4. Member States shall not allocate emission allowances free of charge to an installation where data relating to this installation has not been verified as satisfactory.

Member States may only decide to allocate emission allowances free of charge to an installation where data relating to this installation has not been verified as satisfactory, if it is satisfied that the material non-conformities or data gaps leading to the verifier's judgment are due to exceptional and unforeseeable circumstances that could not have been avoided even if all due care had been exercised and that are beyond the control of the operator of the installation concerned, in particular because of circumstances such as natural disasters, war, threats of war, terrorist acts, revolution, riot, sabotage or acts of vandalism.

5. Upon verification, Member States shall, in particular, ensure that there are no overlaps between sub-installations and no double counting.

Article 9

Capacity of an installation

1. On the basis of the data collected under Article 7, Member States shall determine and approve the initial installed capacity of each product benchmark sub-installation on the reference date of 30 June 2011 as follows:
 - (a) in principle, the initial installed capacity shall be the average of the 10 highest daily production volumes in the period from 1 January 2005 to 30 June 2011 multiplied by 365 days;
 - (v) where it is not possible to determine the initial installed capacity according to point (a), the initial installed capacity shall be the average of the 5 highest weekly production volumes in the period from 1 January 2005 to 30 June 2011 multiplied by 52 weeks;
 - (w) where it is not possible to determine the initial installed capacity according to points (a) and (b), the initial installed capacity shall be the installed production capacity as stated in the greenhouse gas emissions permit or the permit in force in accordance with Directive 2008/1/EC;
 - (x) where it is not possible to determine the initial installed capacity according to points (a), (b) and (c), the initial installed capacity shall be the nameplate capacity;
 - (y) where it is not possible to determine the initial installed capacity according to points (a), (b), (c) and (d), an experimental verification of the installation's capacity under the supervision of the competent authority and a verifier shall take place in order to ensure that the parameter used are typical for the sector concerned and that the results of the experimental verification are representative.
2. For incumbent installations that have had a significant extension or a significant reduction of capacity between 1 January 2005 to 30 June 2011, Member States shall

also determine and approve the initial installed capacity of each heat benchmark sub-installation, each fuel benchmark sub-installation and each process emissions sub-installation on the reference date of 30 June 2011 in accordance with paragraph 1 of this Article.

3. For the purposes of this Article, the initial installed capacity shall be expressed as follows:
 - (a) for the product benchmark sub-installation in the unit defined for the product concerned in Annex I;
 - (z) for the heat benchmark sub-installation as terajoule of measurable heat consumed for the production of products or the production of mechanical energy, heating or cooling within the installation's boundaries per year;
 - (aa) for the fuel benchmark sub-installation as terajoule of fuel input per year;
 - (bb) for the production of process emissions as tonnes of carbon dioxide equivalent emitted per year.

Article 10

Historical activity level

1. For incumbent installations, Member States shall determine historical activity levels of each installation for the baseline period from 1 January 2005 to 31 December 2008, or, where they are higher, for the period from 1 January 2009 to 31 December 2010, on the basis of the data collected under Article 7.
2. The product-related historical activity level shall, for each product for which a product benchmark has been determined as referred to in Annex I, refer to the median annual historical production of this product in the installation concerned during the baseline period.
3. The heat-related historical activity level shall refer to the median annual historical import or production of measurable heat consumed for the production of products or for the production of mechanical energy, heating or cooling and with the exception of the consumption for the production of electricity, during the baseline period expressed as terajoule per year.
4. The fuel-related historical activity level shall refer to the median annual historical consumption of fuels used for the production of non-measurable heat consumed for the production of products or for the production of mechanical energy, including safety flaring, during the baseline period expressed as terajoule per year.
5. For process emissions, which occurred in relation with the production of products in the installation concerned during the baseline period referred to in paragraph 1, the process-related historical activity level shall refer to the median annual historical process emissions expressed as tonnes of carbon dioxide equivalent.

6. For the purposes of the determination of the median values referred to in paragraphs 1 to 5 only calendar years during which the installation has been operating for at least one day shall be taken into account.

If the installation has been operating less than three calendar years during the baseline period, the historical activity levels shall be calculated on the basis of the initial installed capacity of the installation multiplied by the relevant capacity utilisation factor.

7. By way of derogation from paragraph 2, Member States shall determine the product-related historical activity level for products to which the product benchmarks referred to in Annex III apply on the basis of the median annual historical production according to the formulas set out in this same annex.

8. Incumbent installations that are operated only occasionally, including, in particular, installations that are kept in reserve or on standby and installations operating on a seasonal schedule and that have not been operating for at least one day in a given calendar year during the baseline period, shall be considered when determining the median values referred to in paragraph 1, where all of the following conditions are met:

- (a) it is clearly demonstrated that the installation is used occasionally, in particular, operated regularly as standby or reserve capacity or operated regularly following a seasonal schedule;
- (cc) the installation is covered by a greenhouse gas emissions permit and by all other relevant permits required in the national legal order of the Member State to operate the installation;
- (dd) it is technically possible to start operation on short notice and maintenance is carried out on a regular basis.

9. Where an incumbent installation has had a significant capacity extension or a significant reduction of capacity between 1 January 2005 and 30 June 2011, the historical activity levels of the installation concerned shall be the sum of the median values determined in accordance with paragraph 1 without the significant capacity change and the historical activity levels of the added or reduced capacity.

The historical activity levels of the added or reduced capacity shall be the difference between the initial installed capacities for each sub-installation and the installed capacity after the capacity change multiplied by the historical capacity utilisation of the installation concerned at its configuration without the significant capacity change.

Article 11

Allocation at installation level

1. Based on the data collected in accordance with Article 7, Member States shall, for each year, calculate the number of emission allowances allocated free of charge to each incumbent installation on their territory in accordance with paragraphs 2 to 8.

2. For the purpose of this calculation, Member States shall first determine the preliminary annual number of emission allowances allocated free of charge for each sub-installation separately as follows:

(a) for each product benchmark sub-installation, the preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the value of this product benchmark as referred to in Annex I multiplied by the relevant product-related historical activity level;

(ee) For

the heat benchmark sub-installation, the preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the value of the heat benchmark for measurable heat as referred to in Annex I multiplied by the heat-related historical activity level for the consumption of measurable heat;

the fuel benchmark sub-installation, preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the value of the fuel benchmark as referred to in Annex I multiplied by the fuel-related historical activity level for the fuel consumed;

the process emissions sub-installation, the preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the process-related historical activity level multiplied by 0.9700.

3. For the purpose of implementing Article 10a(11) of Directive 2003/87/EC, the factors referred to in Annex VI shall be applied to the preliminary annual number of emission allowances allocated free of charge determined for each sub-installation pursuant to paragraph 2 of this Article for the year concerned where the processes in those sub-installations serve sectors or subsectors deemed not to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU.

Where the processes in those sub-installations serve sectors or subsectors deemed to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU, the factor to be applied for the years 2013 and 2014 shall be 1. The sectors or subsectors for which the factor is 1 for the years 2015 to 2020 shall be determined pursuant to Article 10a(13) of Directive 2003/87/EC.

4. Where at least 95% of the heat benchmark sub-installation, of the fuel benchmark sub-installation or of the process emissions sub-installation serve sectors or subsectors deemed to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU, the sub-installation as a whole is deemed to be exposed to a significant risk of carbon leakage.

Where at least 95% of the heat benchmark sub-installation, of the fuel benchmark sub-installation or of the process emissions sub-installation serve sectors or subsectors not deemed to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU, the sub-installation as a whole is not deemed to be exposed to a significant risk carbon leakage.

5. The preliminary annual number of emission allowances allocated free of charge for sub-installations that received measurable heat from sub-installations producing products covered by the nitric acid benchmarks referred to in Annex I shall be reduced by the annual historical consumption of that heat during the baseline period referred to in Article 10(1) multiplied by the value of the heat benchmark for this measurable heat as referred to in Annex I.
6. The preliminary total annual amount of emission allowances allocated free of charge for each installation shall be the sum of all sub-installations' preliminary annual numbers of emission allowances allocated free of charge calculated in accordance with paragraphs 2, 3, 4 and 5.
7. Where an installation encompasses sub-installations producing both pulp (short fibre kraft pulp, long fibre kraft pulp, thermo-mechanical pulp and mechanical pulp, sulphite pulp or other pulp not covered by a product benchmark) and paper products (newsprint, uncoated fine paper, coated fine paper, tissue, testliner and fluting, uncoated carton board, coated carton board or paper products not covered by a product benchmark), the preliminary total amount of emission allowances allocated free of charge will only take into account the products placed on the market. There should not be any allowances for the pulp processed into paper in the same installation. When determining the preliminary total annual amount of emission allowances allocated free of charge for each installation, Member States shall ensure that emissions are not double counted. In particular, where an intermediate product that is covered by a product benchmark according to the definition of the respective system boundaries set out in Annex I is imported by an installation, emissions shall not be double counted when determining the preliminary total annual amount of emission allowances allocated free of charge for both installations concerned.
8. The final total annual amount of emission allowances allocated free of charge for each incumbent installation, except for installations covered by Article 10a(3) of Directive 2003/87/EC, shall be the preliminary total annual amount of emission allowances allocated free of charge for each installation determined in accordance with the previous paragraph multiplied by the cross-sectoral correction factor as determined in accordance with Article 17(3).

For installations covered by Article 10a(3) of Directive 2003/87/EC and eligible for the allocation of free emission allowances, the final total annual amount of emission allowances allocated free of charge shall correspond to the preliminary total annual amount of emission allowances allocated free of charge for each installation determined in accordance with paragraph 6 annually adjusted by a linear factor of 1.74%.

Article 12

Allocation in respect of grey cement clinker

1. By way of derogation from Article 11(2)(a), Member States shall multiply the preliminary annual number of emission allowances allocated free of charge for a given year for a product benchmark sub-installation to which the grey cement clinker benchmark referred to in Annex I applies, by 0.963 where the historical clinker-to-

cement ratio of the baseline period of the sub-installation concerned was between 0.7 and 0.75 and by 0.926 where the historical clinker-to-cement ratio of the baseline period of the sub-installation concerned was above 0.75.

2. Member States shall not apply the factor referred to in the previous paragraph where the historical clinker-to-cement ratio of the baseline period of the sub-installation concerned was below 0.7.

Article 13

Allocation in respect of steam cracking

By way of derogation from Article 11(2)(a), the preliminary annual number of emission allowances allocated free of charge for a product benchmark sub-installation relating to the production of high value chemicals (hereinafter "HVC") shall correspond to the value of the steam cracking product benchmark referred to in Annex I multiplied by the historical activity level determined in accordance with Annex III and multiplied by the quotient of the total direct emissions including emissions from net imported heat over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent and the sum of these total direct emissions and the historical indirect emissions from the steam cracking over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent calculated on the basis of the historical electricity consumption times 0.465 tonnes of carbon dioxide per megawatt-hour. To the result of this calculation, 1.78 times the median historical production of supplementary feed of hydrogen expressed in tons of hydrogen, 0.24 times the median historical production of supplementary feed of ethylene expressed in tons of ethylene and 0.16 times the median historical production of supplementary feed of other high value chemicals than hydrogen and ethylene expressed in tons of HVC shall be added.

Article 14

Allocation in respect of vinyl chloride monomer

By way of derogation from Article 11(2)(a), the preliminary annual number of emission allowances allocated free of charge for a sub-installation relating to the production of vinyl chloride monomer (hereinafter "VCM") shall correspond to the value of the VCM benchmark multiplied by the historical activity level for VCM production expressed as tonnes and multiplied by the quotient of the direct emissions for the production of VCM over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent and the sum of these direct emissions and the hydrogen-related emissions for the production of VCM over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent calculated on the basis of the historical hydrogen consumption times 56.1 tonnes of carbon dioxide per TJ.

Article 15

Heat flows between installations

1. Where an installation included in the Union scheme has produced and exported measurable heat for consumption by an installation or other entity not included in the Union scheme, the preliminary annual number of emission allowances allocated free of charge for the heat benchmark sub-installation determined pursuant to Article 11(2)(b) shall be adjusted by adding the historical production of the measurable heat exported to the consumer not covered by the Union scheme in the year concerned multiplied by the value of the heat benchmark for measurable heat set out in Annex I.
2. The factors referred to in Annex VI shall be applied. However, where the competent authority is satisfied that the consumer of the measurable heat belongs to a sector or subsector deemed to be exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU, the factor shall be 1.

Article 16

Exchangeability of fuel and electricity

1. For each product benchmark sub-installation referred to in Annex I with consideration of exchangeability of fuel and electricity, the preliminary annual number of emission allowances allocated free of charge shall correspond to the value of the relevant product benchmark set out in Annex I multiplied by the product-related historical activity level and multiplied by the quotient of the total direct emissions including emissions from net imported heat over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent and the sum of these total direct emissions and the historical indirect emissions from the production of the product concerned over the baseline period referred to in Article 10(1) of this Decision expressed as tonnes of carbon dioxide equivalent calculated on the basis of the historical electricity consumption times 0.465 tonnes of carbon dioxide per megawatt-hour.
2. For the purposes of the calculation pursuant to paragraph 1, the historical electricity consumption refers to the total annual electricity consumption as specified in the definition of processes and emissions covered in Annex I expressed in megawatt-hours for the production of the product concerned during the baseline period referred to in Article 10(1) of this Decision.

CHAPTER III

ALLOCATION DECISIONS

Article 17

National Implementing measures

1. In accordance with Article 11(1) of Directive 2003/87/EC, Member States shall submit to the Commission by 30 September 2011 a list of installations identified pursuant to in Article 5.

2. The list referred to in paragraph 1 shall for each incumbent installation contain, in particular,
 - (a) an identification of the installation and its boundaries;
 - (b) an identification of each sub-installation of an installation;
 - (c) for each installation and sub-installation information on whether or not it belongs to a sector or subsector exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU;
 - (d) for each sub-installation the preliminary annual number of emission allowances allocated free of charge over the period from 2013 to 2020 as determined in accordance with Article 11(2);
 - (e) in addition to point (d), for sub-installations not serving a sector or subsector exposed to a significant risk of carbon leakage as determined by Decision 2010/2/EU, the preliminary annual numbers of emission allowances allocated free of charge over the period from 2013 to 2020 decreasing by equal amounts from 80% of the quantity in 2013 to 30% in 2020 as determined in accordance with Article 11(3);
 - (f) for each installation the preliminary total annual amounts of emission allowances allocated free of charge over the period from 2013 to 2020 as determined in accordance with Article 11(5);

The list shall also identify all heat producing electricity generators, and small installations that may be excluded from the Union scheme pursuant to Article 27 of Directive 2003/87/EC.

3. Upon receipt of the list referred to in paragraph 2 of this Article, the Commission shall assess the inclusion of each installation in the list and the related preliminary total annual amounts of emission allowances allocated free of charge.

Upon notification by each Member State of the preliminary total annual amounts of emission allowances allocated free of charge over the period from 2013 to 2020, the Commission shall determine the uniform cross-sectoral correction factor as referred to in Article 10a(5) of Directive 2003/87/EC. It shall be determined by comparing the sum of the preliminary total annual amounts of emission allowances allocated free of charge in each year over the period from 2013 to 2020 without application of the factors referred to in Annex VI with the annual amount of allowances that is calculated in accordance with Article 10a(5) of Directive 2003/87/EC for installations that are not electricity generator or new entrants, taking into account the relevant share of the annual Union-wide total quantity, as determined pursuant to Article 9 of that Directive, and the relevant amount of emissions which are only included in the Union scheme from 2013 onwards.

4. If the Commission does not reject an installation's inscription on this list, including the corresponding preliminary total annual amounts of emission allowances allocated free of charge for this installation, the Member State concerned shall proceed to the determination of the final annual amount of emission allowances allocated free of

charge for each year over the period from 2013 to 2020 in accordance with Article 11 (8) of this Decision.

Article 18

Changes to carbon leakage exposure

Within three months of the adoption of the lists referred to in Article 10a(13) of Directive 2003/87/EC for the years 2015 to 2020, each Member State shall revise the list referred to in Article 17(1) of this Decision clearly indicating the changes to the deemed carbon leakage exposure of installations and sub-installations and the related preliminary annual amount of free allocation where applicable and submit that list to the Commission.

CHAPTER IV

NEW ENTRANTS AND CLOSURES

Article 19

Application for free allocation

1. Upon application by a new entrant, Member States shall determine on the basis of the present rules the amount of allowances to be allocated free of charge once the installation concerned has started normal operation.
2. To this end, the installation concerned shall be divided in sub-installations in accordance with Article 6 of this Decision.
3. Member States shall require the operator to submit together with the application referred to in paragraph 1 all relevant information and data regarding each parameter listed in Annex V for each sub-installation separately to the competent authority. If necessary, Member States may require the operator to submit more disaggregated data.
4. Member States shall only accept data submitted pursuant to paragraph 3 that has been verified as satisfactory by a verifier, in accordance with the requirements set out in Article 8, to ensure that reliable and correct data is reported.
5. Member States shall notify the application referred to in paragraph 1 to the Commission within one month following its receipt.

Article 20

Capacity of installations qualifying as new entrant

1. For installations referred to in Article 3(h) of Directive 2003/87/EC, with the exception of installations that have had a significant extension after 30 June 2011, Member States shall approve the installed capacity of the installation and its sub-installations before calculating the allocation to the installation.
2. For installations referred to in the previous paragraph, the installed capacity shall be the production volume of the installation with its equipment and configuration on the start of normal operations if the installation were operated 24 hours multiplied by 365 days.
3. For installations having had a significant capacity extension after 30 June 2011, Member States shall approve the added capacity and the installed capacity of the installation and its sub-installations after the significant extension before calculating the allocation to the installation.

Article 21

Activity levels

1. For new entrants, Member States shall determine activity levels of each installation as follows:
 - (a) the product-related activity level shall, for each product for which a product benchmark has been determined as referred to in Annex I, be the installed production capacity for this product of the installation concerned multiplied by the relevant standard capacity utilisation factor.
 - (ff) the heat-related activity level shall be the initial production or import capacity of measurable heat consumed for the production of products or for the production of mechanical energy, heating or cooling of the installation concerned multiplied by the relevant capacity utilisation factor.
 - (gg) the fuel-related activity level shall be the initial consumption capacity of fuels used for the production of non-measurable heat consumed for the production of products and for the production of mechanical energy of the installation concerned multiplied by the relevant capacity utilisation factor.
 - (hh) the process-related activity level shall be the production capacity of process emissions of the process unit multiplied by a specific emission factor and by the relevant capacity utilisation factor.
2. The standard capacity utilisation factor referred to in paragraph 1(a) shall be determined and published by the Commission on the basis of the data collection carried out by Member States in accordance with Article 7 of this Decision.

The relevant capacity utilisation factor referred to in paragraphs 1(b) to (d) shall be determined by Member States on the basis of duly substantiated and independently verified information on the installation's normal operation, maintenance, common production cycle, energy efficient techniques and, where applicable, historical capacity utilisation.

Where applicable, the specific emission factor for the production of process emissions referred to in paragraph 1(d) shall be determined by Member States on the basis of duly substantiated and independently verified information on the emission intensity of the input and greenhouse gas efficient techniques.

3. By way of derogation from paragraph 1(a), Member States shall determine the product-related activity level for products to which the product benchmarks referred to in Annex VII apply according to the formulas set out in that Annex.
4. For installations which had a significant capacity extension after 30 June 2011, Member States shall determine the activity levels only for the added capacity of the sub-installations to which the significant extension relates.

Article 22

Allocation to new entrants

1. For the purposes of the allocation of emission allowances to new entrants, with the exception of allocations to installations referred to in the third indent of Article 3(h) of Directive 2003/87/EC, Member States shall calculate the preliminary annual number of emission allowances allocated free of charge as of the start of normal operation of the installation for each sub-installation separately, as follows:
 - (a) for each product benchmark sub-installation, the preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the value of that product benchmark multiplied by the product-related activity level;
 - (ii) for the heat benchmark sub-installation, the preliminary annual number of emission allowances allocated free of charge shall correspond to the value of the heat benchmark for this measurable heat as referred to in Annex I multiplied by the heat-related activity level;
 - (jj) for the fuel benchmark sub-installation, the preliminary annual number of emission allowances allocated free of charge shall correspond to the value of the fuel benchmark as referred to in Annex I multiplied by the fuel-related activity level;
 - (kk) for the production of process emissions, the preliminary annual number of emission allowances allocated free of charge for a given year shall correspond to the process-related activity level multiplied by 0.9700.

Article 11(3) to (5) of this Decision shall apply to the calculation of the preliminary annual number of emission allowances allocated free of charge.

2. The preliminary total annual amount of emission allowances allocated free of charge shall be the sum of all sub-installations' preliminary annual numbers of emission allowances allocated free of charge calculated in accordance with paragraph 1.
3. The final annual amount of emission allowances allocated free of charge shall correspond to the preliminary total annual amount of emission allowances allocated

free of charge for each installation determined in accordance with paragraph 2 of this Article annually adjusted by a linear factor of 1.74% using 2013 as reference year.

4. For independently verified emissions of the new entrant which occurred prior to the start of normal operation, additional allowances shall be allocated on the basis of historic emissions expressed as tonnes of carbon dioxide equivalent.
5. Emission allowances from the new entrants reserve created pursuant to Article 10a(7) of Directive 2003/87/EC shall be allocated on a first come, first served basis with regard to the date of start of normal operations.

When half of the amount of allowances set aside for new entrants pursuant to Article 10a(7) of Directive 2003/87/EC, notwithstanding the amount of allowances available pursuant to Article 10a(8) of Directive 2003/87/EC, is issued or to be issued until 2020 to new entrants, the Commission shall assess whether a queuing system should be put in place to ensure that access to the reserve is managed in a fair way.

Article 23

Allocation as new entrant following a significant capacity extension

1. Where an installation has had a significant capacity extension after 30 June 2011, Member States shall, upon application by the operator and without prejudice to the allocation to an installation pursuant to Article 11, determine on the basis of the methodology set out in Article 21 the number of free emission allowances to be allocated, in so far as this extension is concerned.
2. Member States shall require the operator to submit together with the application evidence demonstrating that the criteria for a significant capacity extension have been met and to provide the information referred to in Article 18(3), in particular on the date extended operations started, to support any allocation decision.

Article 24

Significant capacity reduction

1. Where an installation has had a significant capacity reduction after 30 June 2011, Member States shall determine the amount by which the number of allowances to be allocated for free is reduced, in so far as this reduction is concerned.
2. Member States shall adjust the preliminary annual number of emission allowances allocated free of charge for each sub-installation of the installation concerned separately taking into account the capacity reduction. Member States shall then determine the preliminary total annual amount and the final total annual amount of emission allowances allocated free of charge to the installation concerned.
3. The allocation to the installation shall be adjusted accordingly as of 2013 or the year following the one during which the capacity reduction took place.

Article 25

Cessation of operations of an installation

1. An installation is deemed to have ceased operations, where any of the following conditions is met:
 - (a) the greenhouse gas emissions permit or the permit in force in accordance with Directive 2008/1/EC has expired;
 - (ll) the permits referred to under point (a) have been withdrawn;
 - (mm) operation of the installation is technically impossible;
 - (nn) the installation is not operating, but has been operating before and it is technically impossible to resume operation;
 - (oo) the installation is not operating, but has been operating before and the operator cannot establish that this installation will resume operation at the latest within 6 months after having ceased operations.
2. Paragraph 1(e) shall not apply to installations that are kept in reserve or standby and installations that are operated on a seasonal schedule, where all of the following conditions are fulfilled:
 - (a) the operator holds a greenhouse gas emissions permit and all other relevant permits;
 - (pp) it is technically possible to start operations without making physical changes to the installation;
 - (qq) regular maintenance is carried out.
3. Where an installation has ceased operation, the Member State concerned shall not issue emission allowances to this installation as of the year following the cessation of operations.
4. Member States may suspend the issuance of the emission allowances to installations referred to in paragraph 1(e) as long as it is not established that the installation will resume operations.

Article 26

Partial cessation of operations of an installation

1. An installation is deemed to have partially ceased operations, provided that one sub-installation, which contributes to at least 30 % or to the allocation of more than 50 000 allowances to the installation's final annual amount of emission allowances allocated free of charge, reduces its activity level in a given calendar year by at least 50% compared to the activity level used for calculating the sub-installation's allocation (hereinafter "initial activity level").

2. The allocation of emission allowances to an installation that partially ceases operations shall be adjusted as of the year following the year during which it partially ceased operations as follows:

If the activity level of the sub-installation referred to in paragraph 1 is reduced by 50% to 75% compared to the initial activity level, the sub-installation shall only receive half of the initially allocated allowances.

If the activity level of the sub-installation referred to in paragraph 1 is reduced by 75% to 90% compared to the initial activity level, the sub-installation shall only receive 25% of the initially allocated allowances.

If the activity level of the sub-installation referred to in paragraph 1 is reduced by 90% or more compared to the initial activity level, no allowances shall be allocated free of charge in respect of the sub-installation concerned.

3. If the activity level of the sub-installation referred to in paragraph 1 reaches an activity level of more than 50% compared to the initial activity level, the installation having partially ceased operations shall receive the allowances initially allocated to it as of the year following the calendar year during which the activity level exceeded the threshold of 50%.
4. If the activity level of the sub-installation referred to in paragraph 1 reaches an activity level of more than 25% compared to the initial activity level, the installation having partially ceased operations shall receive half of the allowances initially allocated to it as of the year following the calendar year during which the activity level exceeded the threshold of 25%.

Article 27

Changes to the operation of an installation

1. Member States shall ensure that all relevant information about any planned or effective changes to the capacity, activity level and operation of an installation is submitted by the operator by 31 December of each year.
2. Where there is a change to an installation's capacity, activity level or operation which has an impact on the installation's allocation, Member States shall submit all relevant information, including the revised preliminary total annual amount of emission allowances allocated free of charge for the installation concerned determined in accordance with this Decision, to the Commission before determining the final total annual amount of emission allowances allocated free of charge. In accordance with Article 11 of Directive 2003/87/EC, the Commission may reject the revised preliminary total annual amount of emission allowances allocated free of charge for the installation concerned.

CHAPTER V

FINAL PROVISION

Article 28

Addressees

This Decision is addressed to the Member States.

Done at Brussels,

For the Commission
Member of the Commission

ANNEX I
Product benchmarks

1. Definition of product benchmarks and system boundaries without consideration of exchangeability of fuel and electricity

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Coke	Coke-oven coke (obtained from the carbonization of coking coal, at high temperature) or gas-works coke (by-product of gas-works plants) expressed as tons of dry coke. Lignite coke is not covered by this benchmark.	All processes directly or indirectly linked to the process units coke ovens, H ₂ S/NH ₃ incineration, coal preheating (defreezing), coke gas extractor, desulphurization unit, distillation unit, steam generation plant, pressure control in batteries, biological water treatment, flares, miscellaneous heating of by-products and hydrogen separator are included. Coke oven gas cleaning is not included.	yes	0.286
Iron ore pellets	Agglomerated iron ores and concentrates in the shape of pellets for the use in iron ore reduction processes not containing iron-containing recycling materials	All processes directly or indirectly linked to the production of iron ore pellets are included	yes	0.019
Sintered ore	Agglomerated iron-bearing product containing iron ore	All processes directly or indirectly linked to the process units sinter	yes	0.171

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	fines, fluxes and iron-containing recycling materials with the chemical and physical properties such as the level of basicity, mechanical strength and permeability required to deliver iron and necessary flux materials into iron ore reduction processes.	strand, ignition, feedstock preparation units, hot screening unit, sinter cooling unit, cold screening unit and steam generation unit are included.		
Hot metal	Liquid iron saturated with carbon for further processing	All processes directly or indirectly linked to the process units blast furnace, hot metal treatment units, blast furnace blowers, blast furnace hot stoves, basic oxygen furnace, secondary metallurgy units, vacuum ladles, casting units (including cutting), slag treatment unit, burden preparation, BF gas treatment unit, dedusting units, scrap pre-heating, coal drying for PCI, vessels preheating stands, casting ingots preheating stands, compressed air production, dust	yes	1.328

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
		treatment unit (briquetting), sludge treatment unit (briquetting), steam injection in BF unit, steam generation plant, converter BOF gas cooling, flares and miscellaneous are included.		
Pre-bake anode	Anodes for aluminium electrolysis use consisting of petrol coke, pitch and normally recycled anodes, which are formed to shape specifically intended for a particular smelter and baked in anode baking ovens to a temperature of around 1150°C	All processes directly or indirectly linked to the production of pre-bake anodes are included.	yes	0.324
Aluminium	unwrought non-alloy aluminium	All processes directly or indirectly linked to the production step electrolysis are included.	yes	1.514
Grey cement clinker	Grey cement clinker as total clinker produced	All processes directly or indirectly linked to the production of grey cement clinker are included.	Yes	0.766
White cement	White cement clinker for use as	All processes directly or indirectly linked to the	Yes	0.987

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
clinker	main binding component in the formulation of materials such as joint fillers, ceramic tile adhesives, insulation, and anchorage mortars, industrial floor mortars, ready mixed plaster, repair mortars, and water-tight coatings with maximum contents of 0.35 mass-% Fe ₂ O ₃ , 0.003 mass-% Cr ₂ O ₃ and 0.03 mass-% Mn ₂ O ₃ .	production of white cement clinker are included.		
Lime	Quicklime: calcium oxide (CaO) produced by the decarbonation of limestone (CaCO ₃) as “standard pure” lime with a free CaO content of 94.5%. Lime produced and consumed in the same installation for purification processes is not covered by this product benchmark.	All processes directly or indirectly linked to the production of lime are included.	yes	0.954

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Dolime	<p>Dolime or calcined dolomite as mixture of calcium and magnesium oxides produced by the decarbonation of dolomite ($\text{CaCO}_3 \cdot \text{MgCO}_3$) with a residual CO_2 exceeding 0.25%, a free MgO content between 25% and 40% and a bulk density of the commercial product below 3.05 g/cm^3.</p> <p>Dolime shall be expressed as "standard pure dolime" quality with a free CaO content of 57.4% and a free MgO content of 38.0%.</p>	All processes directly or indirectly linked to the production of dolime are included.	yes	1.072
Sintered dolime	Mixture of calcium and magnesium oxides used solely for the production of refractory bricks and other refractory products with a minimum bulk density of 3.05 g/cm^3 .	All processes directly or indirectly linked to the production of sintered dolime are included.	yes	1.449
Float glass	Float / ground /	All processes directly or	yes	0.453

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	polish glass (as tons of melted glass exiting the lehr).	indirectly linked to the production steps melter, refiner, working end, bath and lehr are included.		
Bottles and jars of colourless glass	Bottles of colourless glass of a nominal capacity < 2.5 litres, for beverages and foodstuffs (excluding bottles covered with leather or composition leather; infant's feeding bottles) except extra-white flint products with an iron oxide content expressed as percent Fe ₂ O ₃ by weight lower than 0.03% and colour co-ordinates of L in the range 100 to 87, of a in the range 0 to -5 and of b in the range 0 to 3 (using the CIELAB advocated by the Commission Internationale d'Éclairage) expressed as tons of packed product.	All processes directly or indirectly linked to the production steps materials handling, melting, forming, downstream processing, packaging and ancillary processes are included.	yes	0.382
Bottles and jars of	Bottles of coloured glass of a nominal	All processes directly or indirectly linked to the	yes	0.306

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
coloured glass	capacity < 2.5 litres, for beverages and foodstuffs (excluding bottles covered with leather or composition leather; infant's feeding bottles) expressed as tons of packed product.	production steps materials handling, melting, forming, downstream processing, packaging and ancillary processes are included.		
Continuous filament glass fibre products	Melted glass for the production of continuous filament glass fibre products namely chopped strands, rovings, yarns and staple glass fibre and mats (expressed a tons of melted glass exiting the foreheath). Products for thermal, acoustic and fire insulation are not included.	All processes directly or indirectly linked to the production processes glass melting in the furnaces and glass refining in the forehearths are included. Downstream processes to convert the fibres into sellable products are not included in this product benchmark.	yes	0.406
Facing bricks	Facing bricks with a density > 1000 kg/m ³ used for masonry based on EN 771-1, excluding pavers, clinker bricks and blue braised facing bricks.	All processes directly or indirectly linked to the production processes raw material preparation, component mixing, forming and shaping of ware, drying of ware, firing of ware, product finishing and flue gas cleaning are included.	no	0.139

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Pavers	Clay bricks used for flooring according to EN 1344.	All processes directly or indirectly linked to the production processes raw material preparation, component mixing, forming and shaping of ware, drying of ware, firing of ware, product finishing and flue gas cleaning are included.	no	0.192
Roof tiles	Clay roofing tiles as defined in EN 1304:2005 excluding blue braised roof tiles and accessories.	All processes directly or indirectly linked to the production processes raw material preparation, component mixing, forming and shaping of ware, drying of ware, firing of ware, product finishing and flue gas cleaning are included.	no	0.144
Spray dried powder	Spray-dried powder for the production of dry-pressed wall and floor tiles in tonnes of powder produced.	All processes directly or indirectly linked to the production of spray-dried powder are included.	yes	0.076
Plaster	Plasters consisting of calcined gypsum or calcium sulphate (including for use in building, for use in dressing woven fabrics or surfacing paper, for use in dentistry, for use in	All processes directly or indirectly linked to the production steps milling, drying and calcining are included.	no	0.048

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	land remediation), in tonnes of stucco. Alpha plaster is not covered by this product benchmark.			
Dried secondary gypsum	Dried secondary gypsum (synthetic gypsum produced as a recycled by-product of the power industry or recycled material from construction waste and demolition) expressed as tons of product.	All processes directly or indirectly linked to the drying of secondary gypsum are included	no	0.017
Short fibre kraft pulp	Short fibre kraft pulp is a wood pulp produced by the sulphate chemical process using cooking liquor, characterised by fibre lengths of 1 – 1,5 mm, which is mainly used for products which require specific smoothness and bulk, as tissue and printing paper, expressed as net saleable production in Adt (Air Dried Tonnes).	All processes which are part of the pulp production process (in particular the pulp mill, recovery boiler, pulp drying section and lime kiln and connected energy conversion units (boiler/CHP)) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating,	yes	0.12

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
		landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.		
Long fibre kraft pulp	Long fibre kraft pulp is a wood pulp produced by the sulphate chemical process using cooking liquor, characterised by fibre lengths of 3 – 3,5 mm, which is mainly used for products for which strength is important, as packaging paper, expressed as net saleable production in Adt (Air Dried Tonnes).	All processes which are part of the pulp production process (in particular the pulp mill, recovery boiler, pulp drying section and lime kiln and connected energy conversion units (boiler/CHP)) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.	yes	0.06
Sulphite pulp, thermo-mechanical and	Sulphite pulp produced by a specific pulp making process, e.g. pulp produced by	All processes which are part of the pulp production process (in particular the pulp mill, recovery boiler, pulp	yes	0.02

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
mechanical pulp	<p>cooking wood chips in a pressure vessel in the presence of bisulphite liquor expressed as net saleable production of Adt. Sulphite pulp can be either bleached or unbleached.</p> <p>Mechanical pulp grades such as TMP (thermomechanical pulp) and groundwood as net saleable production of Adt. Not covered by this group are the smaller subgroups of semichemical pulp and BCTMP – bleached chemi-thermomechanical.</p>	<p>drying section and lime kiln and connected energy conversion units (boiler/CHP)) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.</p>		
Recovered paper	<p>Pulps of fibres derived from recovered (waste and scrap) paper or paperboard or of other fibrous cellulosic material expressed as net saleable production of Adt.</p>	<p>All processes which are part of the pulp production process (in particular the pulp mill, recovery boiler, pulp drying section and lime kiln and connected energy conversion units (boiler/CHP)) are included. Other activities on site that are not part of this process such as sawmilling activities,</p>	yes	0.039

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
		woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.		
Newsprint	Specific paper grade (in rolls or sheets) expressed as net saleable production of Adt used for printing newspapers produced from groundwood and/or mechanical pulp or recycled fibres or any percentage of combinations of these two. Weights usually range from 40 to 52 g/m ² but can be as high as 65 g/m ² . Newsprint is machine-finished or slightly calendered, white or slightly coloured and is used in reels for letterpress, offset or flexo-printing.	All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.	yes	0.298

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Uncoated fine paper	<p>Uncoated fine paper, covering both uncoated mechanical and uncoated woodfree expressed as net saleable production of Adt:</p> <p>1. Uncoated woodfree papers suitable for printing or other graphic purposes made from a variety of mainly virgin fibre furnishes, with variable levels of mineral filler and a range of finishing processes. This grade includes most office papers, such as business forms, copier, computer, stationery and book papers.</p> <p>2. Uncoated mechanical papers cover the specific paper grades made from mechanical pulp, used for packaging or graphic purposes/magazines.</p>	<p>All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.</p>	yes	0.318

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Coated fine paper	<p>Coated fine paper covering both coated mechanical and coated woodfree papers expressed as net saleable production of Adt:</p> <p>1. Coated woodfree papers made of fibres produced mainly by a chemical pulping process which are coated in process for different applications and are also known as coated freesheet. This group focuses mainly on publication papers.</p> <p>2. Coated mechanical papers made from mechanical pulp, used for graphic purposes/magazines. The group is also known as coated groundwood.</p>	<p>All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.</p>	yes	0.318
Tissue	Tissue papers expressed as net saleable production of parent reel weight	All processes which are part of the paper production process (in particular paper or board	yes	0.334

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	cover a wide range of tissue and other hygienic papers for use in households or commercial and industrial premises such as toilet paper and facial tissues, kitchen towels, hand towels and industrial wipes, the manufacture of baby nappies, sanitary towels, etc. TAD - Through Air Dried Tissue is not part of this group.	machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included. The conversion of parent reel weight to finished products is not part of this product benchmark.		
Testliner and fluting	Testliner and fluting expressed as net saleable production of Adt: 1. Testliner covers types of paperboard that meet specific tests adopted by the packaging industry to qualify for use as the outer facing layer for corrugated	All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities,	yes	0.248

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	<p>board, from which shipping containers are made. Testliner is made primarily from fibers obtained from recycled fibres.</p> <p>2. Fluting refers to the centre segment of corrugated shipping containers, being faced with linerboard (testliner/kraftliner) on both sides. Fluting covers mainly papers made from recycled fibre but this group also holds paperboard that is made from chemical and semi-chemical pulp.</p>	<p>production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.</p>		
Uncoated carton board	<p>This benchmark covers a wide range of uncoated products (expressed as net saleable production of Adt) which may be single or multiply. Uncoated carton board is mainly used for packaging applications which the main needed characteristic is</p>	<p>All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities, woodworking activities, production of chemicals</p>	yes	0.237

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	<p>strength and stiffness, and for which the commercial aspects as information carrier are of a second order of importance. Carton board is made from virgin and/or recovered fibres, has good folding properties, stiffness and scoring ability. It is mainly used in cartons for consumer products such as frozen food, cosmetics and for liquid containers; also known as solid board, folding box board, boxboard or carrier board or core board.</p>	<p>for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.</p>		
Coated carton board	<p>This benchmark covers a wide range of coated products (expressed as net saleable production of Adt) which may be single or multiply. Coated carton board is mainly used for commercial applications that</p>	<p>All processes which are part of the paper production process (in particular paper or board machine and connected energy conversion units (boiler/CHP) and direct process fuel use) are included. Other activities on site that are not part of this process such as sawmilling activities,</p>	yes	0.273

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	need to bring commercial information printed on the packaging to the shelf in the store in applications such as food, pharma, cosmetics, and other. Carton board is made from virgin and/or recovered fibres, and has good folding properties, stiffness and scoring ability. It is mainly used in cartons for consumer products such as frozen food, cosmetics and for liquid containers; also known as solid board, folding box board, boxboard or carrier board or core board.	woodworking activities, production of chemicals for sale, waste treatment (treating waste onsite instead of offsite (drying, pelletising, incinerating, landfilling), PCC (precipitated calcium carbonate) production, treatment of odorous gases, and district heating are not included.		
Nitric acid	Nitric acid (HNO ₃), to be recorded in tons HNO ₃ (100%).	All processes directly or indirectly linked to the production of the benchmarked product as well as the N ₂ O destruction process are included except the production of ammonia.	yes	0.263
Adipic acid	Adipic acid to be recorded in tons of dry purified adipic	All processes directly or indirectly linked to the production of the	yes	2.79

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	acid stored in silos or packed in (big)bags.	benchmarked product as well as the N ₂ O destruction process are included.		
Vinyl chloride monomer	Vinyl chloride (chloroethylene)	All processes directly or indirectly linked to the production steps direct chlorination, oxychlorination and EDC cracking to VCM are included.	yes	0.204
Phenol/acetone	Sum of phenol, acetone and the by-product alpha-methyl styrene as total production.	All processes directly or indirectly linked to the production of phenol and acetone are included, in particular air compression, hydroperoxidation, cumene recovery from spent air, concentration & cleavage, production fractionation & purification, tar cracking, acetophenone recovery & purification, AMS recovery for export, AMS hydrogenation for ISB recycle, initial waste water purification (1st waste water stripper), cooling water generation (e.g., cooling towers), cooling water utilisation (circulation pumps), flare & incinerators (even if physically located OSB)	yes	0.266

Product benchmark	Definition of products covered	Definition of processes and emissions covered (system boundaries)	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
		as well as any support fuel consumption.		
S-PVC	Polyvinyl chloride; not mixed with any other substances consisting of PVC particles with a mean size between 50 and 200 μm .	All processes directly or indirectly linked to the production of S-PVC are included except the production of VCM.	yes	0.085
E-PVC	Polyvinyl chloride; not mixed with any other substances consisting of PVC particles with a mean size between 0.1 and 3 μm .	All processes directly or indirectly linked to the production of E-PVC are included except the production of VCM.	yes	0.238
Soda ash	Disodium carbonate as total production.	All processes directly or indirectly linked to the process units brine purification, limestone calcination and milk of lime production, absorption of ammonia, precipitation of NaHCO_3 , filtration or Separation of NaHCO_3 crystals from mother liquor, decomposition of NaHCO_3 to Na_2CO_3 , recovery of ammonia and densification or production of dense soda ash are included.	yes	0.843

If no other reference is given, all product benchmarks refer to 1 ton of product produced expressed as saleable (net) production and to 100% purity of the substance concerned.

The carbon leakage exposure of the benchmarked products is based on Decision 2010/2/EU and is valid for 2013 and 2014. In respect of 2013 and 2014, further sectors might be added to this list by Commission Decision.

2. Definition of product benchmarks and system boundaries with consideration of exchangeability of fuel and electricity

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Refinery products	Mix of refinery products with more than 40% light products (motor spirit (gasoline) including aviation spirit, spirit type (gasoline type) jet fuel, other light petroleum oils/ light preparations, kerosene including kerosene type jet fuel, gas oils) expressed as complexity weighted tonne (CWT).	All processes of a refinery matching the definition of one of the CWT process units as well as ancillary non-process facilities operating inside the refinery fence-line such as tankage, blending, effluent treatment, etc. are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	0.0295
EAF carbon steel	Steel containing less than 8% metallic alloying elements and tramp elements to such levels limiting the use to those applications	All processes directly or indirectly linked to the process units electric arc furnace, secondary metallurgy, casting and cutting, post-combustion unit, dedusting unit, vessels heating stands, casting ingots preheating stands, scrap	yes	0.285

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	where no high surface quality and processability is required.	drying and scrap preheating are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.		
EAF high alloy steel	Steel containing more than 8% metallic alloying elements	All processes directly or indirectly linked to the process units electric arc furnace, secondary metallurgy, casting and cutting, post-combustion unit, dedusting unit, vessels heating stands, casting ingots preheating stands, slow cooling pit, scrap drying and scrap preheating are included. The process units FeCr converter and cryogenic storage of industrial gases are not included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	0.357
Iron casting	Casted iron expressed as tons of liquid iron ready alloyed, skinned, and ready for casting.	All processes directly or indirectly linked to the process steps melting shop, casting shop, core shop and finishing are included. For the determination of indirect emissions, the total electricity consumption	yes	0.325

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
		within the system boundaries shall be considered.		
Mineral wool	Mineral wool insulation products for thermal, acoustic and fire applications manufactured using glass, rock or slag.	All processes directly or indirectly linked to the production steps melting, fiberizing and injection of binders, curing and drying and forming are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	no	0.682
Plasterboard	The benchmark covers boards, sheets, panels, tiles, similar articles of plaster/compositions based on plaster, (not) faced/reinforced with paper/paperboard only, excluding articles agglom. with plaster, ornamented (in tonnes of stucco). High-density gypsum fibreboards not covered by this product	All processes directly or indirectly linked to the production steps milling, drying, calcining and board drying are included. For the determination of indirect emissions, only the electricity consumption of heat pumps applied in the drying stage shall be considered.	no	0.131

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	benchmark.			
Carbon black	Furnace carbon black. Gas- and lamp black products are not covered by this benchmark.	All processes directly or indirectly linked to the production of furnace carbon black as well as finishing, packaging and flaring are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	1.765
Ammonia	Ammonia (NH ₃), to be recorded in tons produced.	All processes directly or indirectly linked to the production of the ammonia and the intermediate product hydrogen are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	1.612
Steam cracking	Mix of high value chemicals expressed as total mass of acetylene, ethylene, propylene, butadiene, benzene and hydrogen with a content of these substances, fuel gas, butenes and liquid	All processes directly or indirectly linked to the production of high value chemicals (HVC) as purified product or intermediate product with concentrated content of the respective HVC in the lowest tradable form (raw C ₄ , unhydrogenated pygas) are included except C ₄ extraction (butadiene plant), C ₄ -hydrogenation, hydrotreating of pyrolysis	yes	0.702

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	hydrocarbons of together at least 50 mass-percent of the total product mix.	gasoline & aromatics extraction and logistics/storage for daily operation. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.		
Aromatics	Mix of aromatics expressed as complexity weighted tonne (CWT)	All processes directly or indirectly linked to the aromatics sub-units pygas hydrotreater, benzene/toluene/ xylene (BTX) extraction, TDP, HAD, xylene isomerisation, P-xylene units, cumene production and Cyclo-hexane production are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	0.0295
Styrene	Styrene monomer (vinyl benzene, CAS number: 100-42-5)	All processes directly or indirectly linked to the production of styrene as well as the intermediate product ethylbenzene (with the amount used as feed for the styrene production) are included. For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	0.527

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
Hydrogen	Pure hydrogen and mixtures of hydrogen and carbon monoxide having a hydrogen content $\geq 60\%$ mole fraction of total contained hydrogen plus carbon monoxide based on the aggregation of all hydrogen- and carbon-monoxide-containing product streams exported from the installation concerned.	All relevant process elements directly or indirectly linked to the production of hydrogen and the separation of hydrogen and carbon monoxide are included. These elements lie between: <ul style="list-style-type: none"> a) the point(s) of entry of hydrocarbon feedstock(s) and, if separate, fuel(s) b) the points of exit of all product streams containing hydrogen¹ and/or carbon monoxide¹ c) the point(s) of entry or exit of import or export heat For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.	yes	8.85
Synthesis gas	Mixtures of hydrogen and carbon monoxide having a hydrogen content $< 60\%$ mole fraction of total contained hydrogen plus carbon monoxide based on the aggregation of	All relevant process elements directly or indirectly linked to the production of syngas and the separation of hydrogen and carbon monoxide are included. These elements lie between: <ul style="list-style-type: none"> a) the point(s) of entry of hydrocarbon feedstock(s) and, if separate, fuel(s) b) the points of exit of all product streams containing hydrogen¹ and/or carbon 	yes	0.242

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	all hydrogen- and carbon-monoxide-containing product streams exported from the installation concerned	monoxide c) the point(s) of entry or exit of import or export heat For the determination of indirect emissions, the total electricity consumption within the system boundaries shall be considered.		
Ethylene oxide/ ethylene glycols	The ethylene oxide/ monoethylene glycol benchmark covers the products ethylene oxide (EO, high purity), monoethylene glycol (MEG, standard grade + fiber grade (high purity)), diethylene glycol (DEG), triethylene glycol (TEG) and heavy glycols (HE-EG). The total amount of products is expressed in terms of EO-equivalents (EOE), which are defined as	All processes directly or indirectly linked to the process units EO production, EO purification and glycol section are included. The total electricity consumption (and the related indirect emissions) within the system boundaries is covered by this product benchmark.	yes	[0.512] (subject to further scrutiny)

Product benchmark	Definition of products covered	Definition of processes and emissions covered	Carbon leakage exposure as determined by Commission Decision 2010/2/EU for the years 2013 and 2014	Benchmark value (allowances/t)
	the amount of EO (in mass) that is embedded in one mass unit of the specific glycol and refers to a EO-EG ratio of 1.			

If no other reference is given, all product benchmarks refer to 1 ton of product produced expressed as saleable (net) production and to 100% purity of the substance concerned.

The carbon leakage exposure status of the benchmarked products is based on Decision 2010/2/EU and is valid for 2013 and 2014. Further sectors might be added to this list by Commission Decision.

3. Heat and fuel benchmarks

Benchmark	Benchmark value
Heat benchmark	0.0623 allowances/GJ
Fuel benchmark	0.0561 allowances/GJ

ANNEX II
Specific product benchmarks

1. Refineries benchmark: CWT functions

CWT function	Description	Basis (kt/a)	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
Other Catalytic Cracking	Houdry Catalytic Cracking, Thermoform Catalytic Cracking	F	4.10
Distillate / Gasoil Hydrocracking	Mild Hydrocracking, Severe Hydrocracking, Naphtha Hydrocracking	F	2.85

CWT function	Description	Basis (kt/a)	CWT factor
Residual Hydrocracking	H-Oil, LC-Fining™ and Hycon	F	3.75
Naphtha/Gasoline Hydrotreating	<p>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</p> <p>Naphtha hydrotreating factor includes energy and emissions for Reactor for Selective H/T (NHYT/RXST) but capacity is not counted separately.</p>	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	<p>Steam Methane Reforming, Steam Naphtha Reforming, Partial Oxidation Units of Light Feeds</p> <p>Factor for hydrogen production includes energy and emissions for purification (H2PURE), but capacity is not counted separately.</p>	P	300.00
Catalytic Reforming	Continuous Regeneration, Cyclic, Semi-Regenerative, AROMAX	F	4.95
Alkylation	<p>Alkylation with HF Acid, Alkylation with Sulfuric Acid, Polymerization C3 Olefin Feed, Polymerization C3/C4 Feed, Dimersol</p> <p>Factor for alkylation/polymerization includes energy and emissions for acid regeneration (ACID), but capacity is not counted separately.</p>	P	7.25

CWT function	Description	Basis (kt/a)	CWT factor
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 H2S 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	Xylene Isomerisation	F	1.85

CWT function	Description	Basis (kt/a)	CWT factor
Isomerisation			
Paraxylene production	Paraxylene Adsorption, Paraxylene Crystallization Factor also includes energy and emissions for Xylene Splitter and Orthoxylene Rerun Column.	P	6.40
Metaxylene production	Metaxylene production	P	11.10
Phtalic anhydride production	Phtalic anhydride production	P	14.40
Maleic anhydride production	Maleic anhydride production	P	20.80
Ethylbenzene production	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 extraction	Lube solvent extraction: Solvent is Furfural, Solvent is NMP, Solvent is Phenol, Solvent is SO ₂	F	2.10
Lube solvent dewaxing	Lube solvent dewaxing: Solvent is Chlorocarbon, Solvent is MEK/Toluene, Solvent is MEK/MIBK, Solvent is propane	F	4.55
Catalytic Wax Isomerisation	Catalytic Wax Isomerisation and Dewaxing, Selective Wax Cracking	F	1.60
Lube Hydrocracker	Lube Hydrocracker w/ Multi-Fraction Distillation, 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 Hydrotreating	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-	F	1.15

CWT function	Description	Basis (kt/a)	CWT factor
	Fraction Distillation, Wax H/T w/ Vacuum Stripper		
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
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)

2. Aromatics benchmark: CWT functions

CWT function	Description	Basis (kt/a)	CWT factor
Naphtha/ gasoline hydrotreater	<p>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.</p> <p>Naphtha hydrotreating factor includes energy and emissions for Reactor for Selective H/T (NHYT/RXST) but capacity is not counted separately.</p>	F	1.10
Aromatic solvent extraction	<p>ASE: Extraction Distillation, ASE: Liquid/Liquid Extraction, ASE: Liq/Liq w/ Extr. Distillation</p> <p>CWT factor cover all feeds including Pygas after hydrotreatment. Pygas hydrotreating should be accounted under naphtha hydrotreatment.</p>	F	5.25
TDP/ TDA	Toluene Disproportionation / Dealkylation	F	1.85
Hydrodealkylation	Hydrodealkylation	F	2.45
Xylene isomerisation	Xylene Isomerisation	F	1.85
Paraxylene production	<p>Paraxylene Adsorption, Paraxylene Crystallization</p> <p>Factor also includes energy and emissions for Xylene Splitter and Orthoxylene Rerun Column.</p>	P	6.40
Cyclohexane production	Cyclohexane production	P	3.00
Cumene production	Cumene production	P	5.00

Basis for CWT factors: Net fresh feed (F), Product feed (P)

Annex III

Historical activity level for specific product benchmarks as referred to in Article 9(3)

1. Member States shall determine the product-related historical activity level for the baseline period for products to which the refinery benchmark as referred to in Annex I applies on the basis of the different CWT functions, their definitions, the basis for throughput as well as the CWT factors as listed in Annex II according to the following formula:

$$HAL_{CWT} = MEDIAN \left(1.0183 \cdot \sum_{i=1}^n (TP_{i,k} \times CWT_i) + 298 + 0.315 \cdot TP_{AD,k} \right)$$

with:

HAL_{CWT} :	historical activity level expressed as CWT
$TP_{i,k}$:	throughput of the CWT function i in year k of the baseline period
CWT_i :	CWT factor of the CWT function i
$TP_{AD,k}$:	throughput of the CWT function 'Atmospheric Crude Distillation' in year k of the baseline period

2. Member States shall determine the product-related historical activity level for the baseline period for products to which the lime product benchmark as referred to in Annex I applies according to the following formula:

$$HAL_{lime,standard} = MEDIAN \left(\frac{785 \cdot m_{CaO,k} + 1092 \cdot m_{MgO,k}}{751.7} \cdot HAL_{lime,uncorrected,k} \right)$$

with:

$HAL_{lime,standard}$:	historical activity level for lime production expressed in tons of standard pure lime
$m_{CaO,k}$:	content of free CaO in the produced lime in year k of the baseline period expressed as mass-%
$m_{MgO,k}$:	content of free MgO in the produced lime in year k of the baseline period expressed as mass-%
$HAL_{lime,uncorrected,k}$:	uncorrected historical activity level for lime production in year k of the baseline period expressed in tons of lime

3. Member States shall determine the product-related historical activity level for the baseline period for products to which the dolime product benchmark as referred to in Annex I applies according to the following formula:

$$HAL_{dolime, standard} = MEDIAN \left(\frac{785 \cdot m_{CaO,k} + 1092 \cdot m_{MgO,k}}{865.6} \cdot HAL_{dolime, uncorrected,k} \right)$$

with:

$HAL_{dolime, standard}$:	historical activity level for dolime production expressed in tons of standard pure dolime
$m_{CaO,k}$:	content of free CaO in the produced dolime in year k of the baseline period expressed as mass-%
$m_{MgO,k}$:	content of free MgO in the produced dolime in year k of the baseline period expressed as mass-%
$HAL_{dolime, uncorrected,k}$:	uncorrected historical activity level for dolime production in year k of the baseline period expressed in tons of lime

4. Member States shall determine the product-related historical activity level for the baseline period for products to which the steam cracking product benchmark as referred to in Annex I applies according to the following formula:

$$HAL_{HVC, net} = MEDIAN \left(HAL_{HVC, total,k} - HSF_{H,k} - HSF_{E,k} - HSF_{O,k} \right)$$

with:

$HAL_{HVC, net}$:	historical activity level for high value chemicals net of high value chemicals produced from supplemental feed expressed in tons of HVC
$HAL_{HVC, total,k}$:	historical activity level for total high value chemicals production in year k of the baseline period expressed in tons of HVC
$HSF_{H,k}$:	historical supplementary feed of hydrogen in year k of the baseline period expressed in tons of hydrogen
$HSF_{E,k}$:	historical supplementary feed of ethylene in year k of the baseline period expressed in tons of ethylene
$HSF_{O,k}$:	historical supplementary feed of other high value chemicals than hydrogen and ethylene in year k of the baseline period expressed in tons of HVC

5. Member States shall determine the product-related historical activity level for the baseline period for products to which the aromatics product benchmark as referred to in Annex I applies on the basis of the different CWT functions, their definitions, the basis for throughput as well as the CWT factors as listed in Annex II according to the following formula:

$$HAL_{CWT} = MEDIAN\left(\sum_{i=1}^n (TP_{i,k} \times CWT_i)\right)$$

with:

HAL_{CWT} :	historical activity level expressed as CWT
$TP_{i,k}$:	throughput of the CWT function i in year k of the baseline period
CWT_i :	CWT factor of the CWT function i

6. Member States shall determine the product-related historical activity level for the baseline period for products to which the hydrogen product benchmark as referred to in Annex I applies according to the following formula:

$$HAL_{H_2} = MEDIAN\left(HAL_{H_2+CO,k} \cdot \left(1 - \frac{1 - VF_{H_2,k}}{0.4027}\right) \cdot 0.00008987 \frac{t}{Nm^3}\right)$$

with:

HAL_{H_2} :	historical activity level for hydrogen production referred to 100% hydrogen
$VF_{H_2,k}$:	historical production volume fraction of pure hydrogen in year k of the baseline period
$HAL_{H_2+CO,k}$:	historical activity level for hydrogen production referred to historical hydrogen content expressed as norm cubic meters per year referring to 0°C and 101.325 kPa in year k of the baseline period

7. Member States shall determine the product-related historical activity level for the baseline period for products to which the synthesis gas (syngas) product benchmark as referred to in Annex I applies according to the following formula:

$$HAL_{syngas} = MEDIAN\left(HAL_{H_2+CO,k} \cdot \left(1 - \frac{0.47 - VF_{H_2,k}}{0.0863}\right) \cdot 0.0007047 \frac{t}{Nm^3}\right)$$

with:

HAL_{syngas} :	historical activity level for synthesis gas production referred to 47% hydrogen
$VF_{H_2,k}$:	historical production volume fraction of pure hydrogen in year k of the baseline period
$HAL_{H_2+CO,k}$:	historical activity level for synthesis gas production referred to historical hydrogen content expressed as norm cubic meters per year referring to 0°C and 101.325 kPa in year k of the baseline period

	period
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ANNEX IV

Parameters for baseline data collection for incumbent installations

At least following data need to be submitted by the operator at installation and sub-installation level for all calendar years of the baseline period (2005 – 2010). Member States may request additional data where appropriate:

Parameter	Remarks
Initial installed capacity	Only for product benchmark sub-installations; expressed in the relevant unit as referred to in Annex I
Installed capacity after significant capacity extension or a significant reduction of capacity between 1 January 2005 and 30 June 2011	Only for product benchmark sub-installations; expressed in the relevant unit as referred to in Annex I
Name of product(s)	
NACE codes of product(s)	
PRODCOM codes of product(s)	
Identification as electricity generator	
Historical activity levels	According to type of sub-installation
Throughput of all relevant CWT functions	For refinery and aromatics product benchmarks only
Data used for the calculation of the historical activity levels	At least for the lime, dolime, steam cracking, hydrogen and synthesis gas product benchmarks
Total greenhouse gas emissions	Direct emissions only; only if not all emissions in the installation stem from benchmarked products
Greenhouse gas emissions from fuels	Direct emissions only; only if not all emissions in the installation stem from benchmarked products
Greenhouse gas emissions from processes	Only if not all emissions in the installation stem from benchmarked products
Total energy input from fuels within the installation	Only if not all emissions in the installation stem from benchmarked products
Energy input from fuels within the installation not used for production of measurable heat	Only if not all emissions in the installation stem from benchmarked products
Energy input from fuels within the installation used for production of measurable heat	Only if not all emissions in the installation stem from benchmarked products

Parameter	Remarks
Measurable heat consumed	Only if not all emissions in the installation stem from benchmarked products
Measurable heat imported	
Measurable heat exported	Only to consumers not covered by the ETS
Electricity consumed in accordance with the relevant system boundary definition (Annex I)	Only for sub-installations belonging to a benchmark where the exchangeability of heat and electricity is relevant
Hydrogen used as fuel for the production of vinyl chloride monomer	Only for sub-installations belonging to the vinyl chloride monomer benchmark

ANNEX V

Parameters for data collection for new entrants

Parameter	Remarks
Name of product(s)	
PRODCOM codes of product(s)	
Installed capacity before the significant extension	Only for sub-installations which claim a significant extension of capacity
Added capacity (in case of significant extension)	Only for sub-installations which claim a significant extension of capacity
Installed capacity after the significant extension	Only for sub-installations which claim a significant extension of capacity
Installed capacity	Only for new entrants carrying out one or more of the activities indicated in Annex I of Directive 2003/87/EC, which has obtained a greenhouse gas emissions permit for the first time after 30 June 2011, or carrying out an activity which is included in the Community scheme pursuant to Article 24(1) or (2) for the first time
Relevant Capacity Utilisation Factor (RCUF)	For sub-installations other than product benchmark sub-installations
Projected measurable heat imported	
Projected electricity consumed in accordance with the relevant system boundary definition (Annex I)	Only for sub-installations belonging to a benchmark where the exchangeability of heat and electricity is relevant
Projected hydrogen used as fuel for the production of vinyl chloride monomer	Only for sub-installations belonging to the vinyl chloride monomer benchmark
Start of normal operation	Expressed in a date
Greenhouse gas emissions	Expressed in t CO ₂ eq

ANNEX VI

Factor ensuring the transitional system leading to a decrease of free allocation pursuant to Article 10a(11) of Directive 2003/87/EC

Year	Value of the factor
2013	0.8000
2014	0.7286
2015	0.6571
2016	0.5857
2017	0.5143
2018	0.4429
2019	0.3714
2020	0.3000

Annex VII

Product-related activity level for specific product benchmarks as referred to in Article 20(3)

- Member States shall determine the product-related activity level for products to which the refinery product benchmark as referred to in Annex I applies on the basis of the different CWT functions, their definitions, the basis for throughput, the CWT factors as listed in Annex II as well as the relevant standard capacity utilisation factor according to the following formula:

$$PAL_{CWT} = 1.0183 \cdot \left(\sum_{i=1}^n (TP_i \times CWT_i) + 298 + 0.315 \cdot TP_{AD} \right) \cdot SCUF_{CWT}$$

with:

PAL_{CWT} :	product-related activity level expressed as CWT
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'
$SCUF_{CWT}$:	standard capacity utilisation factor for the refineries benchmark

- Member States shall determine the product-related activity level for products to which the lime product benchmark as referred to in Annex I applies according to the following formula:

$$PAL_{lime,standard} = \frac{785 \cdot m_{CaO} + 1092 \cdot m_{MgO}}{751.7} \cdot PAL_{lime,uncorrected} \cdot SCUF_{lime}$$

with:

$PAL_{lime,standard}$:	product-related activity level for lime production expressed in tons of standard pure lime
m_{CaO} :	content of free CaO in the produced lime expressed as mass-%
m_{MgO} :	content of free MgO in the produced lime expressed as mass-%
$PAL_{lime,uncorrected}$:	uncorrected product-related activity level for lime production expressed in tons of lime
$SCUF_{lime}$:	standard capacity utilisation factor for the lime benchmark

- Member States shall determine the product-related activity level for products to which the dolime product benchmark as referred to in Annex I applies according to the following formula:

$$PAL_{dolime,standard} = \frac{785 \cdot m_{CaO} + 1092 \cdot m_{MgO}}{865.6} \cdot PAL_{dolime,uncorrected} \cdot SCUF_{dolime}$$

with:

$PAL_{dolime,standard}$:	product-related activity level for dolime production expressed in tons of standard pure dolime
m_{CaO} :	content of free CaO in the produced dolime expressed as mass-%
m_{MgO} :	content of free MgO in the produced dolime expressed as mass-%
$PAL_{dolime,uncorrected}$:	uncorrected product-related activity level for dolime production expressed in tons of lime
$SCUF_{dolime}$:	standard capacity utilisation factor for the dolime benchmark

4. Member States shall determine the product-related activity level for products to which the steam cracking product benchmark as referred to in Annex I applies according to the following formula:

$$PAL_{HVC,net} = PAL_{HVC,total} - SF_H - SF_E - SF_O$$

with:

$HAL_{HVC,net}$:	product-related activity level for high value chemicals net of high value chemicals produced from supplemental feed expressed in tons of HVC
$HAL_{HVC,total}$:	product-related activity level for total high value chemicals production expressed in tons of HVC
HSF_H :	supplementary feed of hydrogen expressed in tons of hydrogen
HSF_E :	supplementary feed of ethylene expressed in tons of ethylene
HSF_O :	supplementary feed of other high value chemicals than hydrogen and ethylene expressed in tons of HVC

5. Member States shall determine the product-related activity level for products to which the aromatics product benchmark as referred to in Annex I applies on the basis of the different CWT functions, their definitions, the basis for throughput, the CWT factors as listed in Annex II as well as the relevant standard capacity utilisation factor according to the following formula:

$$PAL_{CWT} = \left(\sum_{i=1}^n (TP_i \times CWT_i) \right) \cdot SCUF_{CWT}$$

with:

PAL_{CWT} :	product-related activity level expressed as CWT
TP_i :	throughput of the CWT function i
CWT_i :	CWT factor of the CWT function i
$SCUF_{CWT}$:	standard capacity utilisation factor for the aromatics benchmark

6. Member States shall determine the product-related activity level for products to which the hydrogen product benchmark as referred to in Annex I applies according to the following formula:

$$PAL_{H_2} = PAL_{H_2+CO} \cdot \left(1 - \frac{1 - VF_{H_2}}{0.4027}\right) \cdot 0.00008987 \frac{t}{Nm^3} \cdot SCUF_{H_2}$$

with:

PAL_{H_2} :	product-related activity level for hydrogen production referred to 100% hydrogen
VF_{H_2} :	production volume fraction of pure hydrogen
PAL_{H_2+CO} :	product-related activity level for hydrogen production referred to hydrogen content expressed as norm cubic meters per year referring to 0°C and 101.325 kPa
$SCUF_{H_2}$:	standard capacity utilisation factor for the hydrogen benchmark

7. Member States shall determine the product-related activity level for products to which the synthesis gas (syngas) product benchmark as referred to in Annex I applies according to the following formula:

$$PAL_{syngas} = PAL_{H_2+CO} \cdot \left(1 - \frac{0.47 - VF_{H_2}}{0.0863}\right) \cdot 0.0007047 \frac{t}{Nm^3} \cdot SCUF_{syngas}$$

with:

PAL_{syngas} :	product-related activity level for synthesis gas production referred to 47% hydrogen
VF_{H_2} :	production volume fraction of pure hydrogen
PAL_{H_2+CO} :	product-related activity level for synthesis gas production referred to hydrogen content expressed as norm cubic meters per year referring to 0°C and 101.325 kPa
$SCUF_{syngas}$:	standard capacity utilisation factor for the synthesis gas benchmark