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IMPLEMENTING PAPER ON PRINCIPLES FOR RULES FOR FREE ALLOCATION – EMISSIONS TRADING SYSTEM- POST 2012

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1. INTRODUCTION

On 23 April 2009 the climate-energy legislative package containing measures to fight climate change and promote renewable energy has been adopted. As part of this package Directive 2009/29/EC of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community[1] provides that full auctioning is the general rule from 2013 onwards for the power sector. For other sectors, a transitional system is put in place for which free allocation in 2013 would be 80 % of a relevant *ex-ante* benchmark reducing gradually to 30% in 2020. Sectors deemed to be exposed to a significant risk of carbon leakage for the relevant period will receive 100% of the benchmark.

The text on the amended Directive contains a range of measures to be adopted and implemented by means of comitology. One of these measures foresees that Community-wide harmonised rules for free allocation should be adopted by 31 December 2010.

Based on preparatory activities for the development of benchmarks, in particular the study on competitiveness issues and allocation systems in the ETS post 2012[2], this implementing paper aims at clarifying aspects of the allocation rules, focussing on those being time-critical as far as the determination of benchmarks and their values is concerned.

2. PRODUCTS FOR WHICH BENCHMARKS ARE TO BE DEVELOPED

In Article 10a (1) the revised ETS Directive stipulates that the implementing measures shall "*…to the extent feasible, determine Community-wide ex ante benchmarks…*" and that "*For each sector or subsector, in principle, the benchmark shall be calculated for products rather than for inputs…*".

Benchmarks should be developed for each sector and sub sector, to the extent feasible. Feasibility is an important criterion for decisions on which products should get benchmarks as well as on the total number of benchmarks. Furthermore, as the benchmarks are related to products, in most cases several benchmarks would be necessary to cover the emissions of a sector.

The term 'each sector' in combination with the feasibility criterion implies that benchmarks should be developed for at least each activity listed in Annex I to the revised ETS Directive, other than combustion of fuels. Concerning the number of benchmarks per activity or sector, the above mentioned study developed guiding criteria to facilitate decisions. Based on discussions with Member States these criteria will be applied to take decisions on which individual products will get benchmarks.

The development of product benchmarks for all sectors only covered by the ETS via the activity 'combustion of fuels' is not considered to be feasible. However, setting product benchmarks might be possible for a number of these sectors and their products. For decisions on such additional product benchmarks, the following guiding criteria are highly relevant:

1. Homogeneity of product(s) and availability of clear product definitions;

[1] OJ L 140, 5.6.2009, p. 63.

[2] Competitiveness issues and allocation systems in the ETS post 2012. Study carried out by Ecofys Netherlands (project leader), Fraunhofer Institute for Systems and Innovation Research and Öko-Institut. November 2009

2. Share of emissions compared to the total industrial emissions within the ETS and compared to the emissions of activities listed in Annex I;
3. Number of installations within the scope of the ETS producing the products;
4. Complexity of production process and allocation complexity due to by-products;
5. Availability and quality of data to establish the product benchmark values within the given timeframe (verified benchmark curves need to be available by February 2010).

The priority to develop product benchmarks must be given to the activities explicitly listed in Annex I.

For the products for which no product benchmarks are developed, free allocation can be given through fall-back approaches.

3. BENCHMARK PRINCIPLES

3.1. Requirements for benchmarks

Article 10a (1) and (2) define basic requirements for the benchmarks:

- Community-wide and fully harmonised: No differentiation in geographical terms leading to one benchmark applicable to all installations within the EU and the EEA;
- *Ex-ante*: The benchmarks (based on the performance 2007-2008) are determined prior to, and applicable through, the entire trading period of free allocation; recital 23 to the Directive emphasises that allocations must be fixed prior to the trading period so as to enable the market to function properly.
- "*average performance of the 10% most efficient installations*" as starting point for benchmarks: The benchmark values are derived from and are applied to all ETS installations[3] producing a certain product without any further differentiation (such as size, age, technology, fuel, raw material, etc.)[4].

The benchmarks to be developed have to meet these requirements without any exception. As the Directive stipulates that the average performance of the 10% most efficient installations shall be the starting point, further steps have to be undertaken to determine the final benchmark values. This includes the analysis of aspects given by Article 10a (1), namely most efficient techniques, substitutes, alternative production processes, high efficiency cogeneration, efficient energy recovery of waste gases, use of biomass and capture and storage of CO_2, where such facilities are available.

3.2. Determination of the benchmark values

In principle, the term "most efficient installations" used in Article 10a (2) could be interpreted to refer to Green House Gas-efficiency or energy-efficiency. However, in view of Article 1 of the ETS Directive, the aim of the ETS is to reduce GHG emissions. This should be reflected

[3] All installations that are in the ETS according to Annex I of the revised ETS Directive (including those with emissions lower than 25 kt of CO_2 eq.) should, in principle, be taken into account for the benchmark development even if they are outside the current EU ETS. This does not apply to installations not meeting the quantitative thresholds of annex I or combustion installations exclusively using biomass.

[4] It is in the nature of the approach that these 10% most efficient installations most likely cannot also be regarded as representative for the sector.

by the methodology defining the benchmark values and therefore, the benchmark values should be based on GHG efficiency and the starting point be the average of the 10% most GHG-efficient installations[5].

The term "average performance" is interpreted as arithmetic mean of the performance expressed as GHG emissions per unit of product. The size or production volume of installations is not cited as a consideration. In case of less than 20 ETS installations producing the benchmarked product, a benchmark value might be derived from, or confirmed by, most efficient technique.

The benchmarks shall be based on the performance in 2007-2008. In case data for this period is not available, including corrections concerning the technical progress towards GHG-efficiency would help to give equal treatment of all sectors. A uniform approach would be to apply an annual improvement factor of 2.0% for all sectors concerned[6].

4. METHODOLOGICAL CHALLENGES - TREATMENT OF CROSS-BOUNDARY HEAT FLOWS

Cross-boundary heat flows in the context of determining and applying the Community-wide allocation rules in the EU ETS, are defined as heat flows that are exchanged between installations with separate greenhouse gas permits, or between installations of which the consuming installation(s) has a greenhouse gas permit, and the producing installation(s) has not, or vice versa[7]. In this respect, it is useful to stress that if heat flows are exchanged between installations which are permitted within the same greenhouse gas permit, heat exchanges do not pose any methodological challenge, as no choice has to be made to which installation allowances would be allocated.

As the issuing of greenhouse gas permits is not always correlated with different ownership structures of installations, different ownership of installations exchanging heat is not always a relevant indicator for determining whether heat exchanges would pose a methodological challenge[8].

The following section provides ways of solving the methodological challenges of cross-boundary heat flows in the context of the above-mentioned definition.

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5 An alternative approach that has been evoked is to calculate in a first step the average of the 10% most energy-efficient installations and multiply this value with the average emission factor of the 10% most GHG-efficient fuel-mixes of the installations considered. As this approach is more complex, without providing much added value, the first interpretation (directly assess the most GHG-efficient installations) should be used to calculate the benchmark values. Some stakeholders would prefer a sector-specific average fuel mix. However, the use of an average clearly contradicts any benchmarking approach which is normally based on *best practice.*

6 This improvement factor is derived from total emission and production figures for all industrial sectors in the EU-25/27 covering the period 2000-2006 (sources: Eurostat and EEA).

7 For example: private households using heat from an ETS-installation, a heat producing installation delivering its heat to a consumer having installed less then 20 MW thermal input, nor performing an explicit Annex I activity.

8 Some Member States in EU-27 have integrated the GHG-permit within the environmental permitting procedures. In those procedures, ownership of installations is not a relevant parameter to decide whether only one or more environmental permits (and thus GHG-permits) are issued. In those cases a CHP-plant owned by an electricity producer, is mostly integrated in the environmental permit (and thus GHG-permit) of the heat consumer, which is another legal entity. In such cases cross-boundary heat flows are not an issue. In those cases owner of the CHP-plant and consumer of the heat make contractual arrangements for dealing with EU ETS.

Solutions have to be consistently applied for the determination of free allowances to be given to such installations. The methodology has to fulfil a number of requirements:

1. The total amount of free allowances should be independent of the heat supply structure in line with recital 23 of the revised Directive stating the allocation rules should avoid "*undue distortions of competition between industrial activities carried out in installations operated by a single operator and production in outsourced installations*".
2. The application of the methodology should be as simple as possible to avoid unnecessary administrative burdens. The data needs in general should be kept to a minimum.
3. No unnecessary obstacles to changes of suppliers (e.g. in-house versus outsourced heat supply or change of heat consumer or supplier) should be created.
4. Free allowances should serve the purpose of maintaining competiveness of European industries in case they cannot pass on carbon costs. Therefore, the degree to which installations face international competition is a relevant consideration in determining which actor should receive free allocation[9].

It can be derived from the first requirement that, in a first step, the calculation of the amount of free allowances is done for the heat consuming and heat producing installation together. For this calculation, several allocation methods are described in section 5. Only in case the heat consuming and heat producing installation have separate greenhouse gas permits, the free allowances have to be allocated either to the producer, to the consumer or to both.

In case of allocation to the producer only, the treatment of installations (partly) allocated on the basis of product benchmarks would be difficult. The reason is that either the total number of free allowances would depend on the ownership structure (higher for two separate installations than for heat production and consumption in the same installation) or the heat consumer would not receive the free allowances for the benchmarked product, potentially leading to competitive disadvantages compared to installations with own heat supply. Other approaches are to be preferred.

Methods foreseeing allocation to both heat producer and consumer have the major disadvantage that adjustment of the number of free allowances would be necessary to ensure that the total number is independent from the greenhouse gas emissions permit situation. Furthermore, deducting allowances from free allocation to an installation could lead in some case to 'negative free allocation' which would be difficult to deal with, both legally and practically.

Therefore, the decisions to whom to allocate allowances should be based on following approach:

- Allocation to heat consumer if that consumer is part of the EU ETS: the heat consumer receives free allocation based on one of the allocation methods, and the heat producer does not receive free allowances. The existence of the ETS may influence the price of traded heat. However, the heat consumer would have a lesser effect from this cost increase by receiving free allowances.
- In case the external heat producer is not an ETS installation, no free allocation can be given to the heat consumer and no allowances are required to be surrendered.

[9] This is consistent with the intention underlying the last sub-paragraph of Article 10a(1).

- Allocation to heat producer in case the heat consumer is not part of the EU ETS, as only ETS installations can receive free allowances.

This approach ensures that total amount of free allowances is independent from the heat supply structure, as the heat consumer receives a free allocation in case of in-house and outsourced heat production. This also gives the consumer flexibility regarding alternative heat supplies. Furthermore, data from the heat producer would only be needed if the heat production benchmark allocation method would be applied[10]. Finally, it is the heat consumer who is more likely to face international competition and possible inability to pass on the cost, rather than the heat producer.

It might be that due to the use of this allocation method, free allocation would be foreseen for an installation without any GHG emissions. For the reasons explained above, this approach is nevertheless considered likely to be compatible with Article 10a and the ETS architecture.

5. CALCULATION RULES

5.1. General formula

The total free allocation for an installation can be calculated as

$$F_{total} = F_P + F_H + F_F + F_G \qquad \text{Equation 1}$$

F_{total}: total number of free allowances

F_p: number of free allowances based on product benchmarks

F_H: number of free allowances based on the heat production benchmark

F_F: number of free allowances based on the fuel mix benchmark

F_G: number of free allowances based on grandfathering

5.2. Product benchmarks

For benchmarked products, the number of free allowances for an installation for the entire trading period can be calculated as

$$F_p = \sum_{k=2013}^{2020} \left(\sum_{i=1}^{n} \left(BM_i \times HAL_i \times EF_{i,k} \times LF_{i,k} \right) \times CF_k \right) \qquad \text{Equation 2}$$

BM_i: benchmark for product i

HAL_i: historic activity level: historical production of product i

$EF_{i,k}$: exposure factor of product i in year k

$LF_{i,k}$: linear reduction factor of product i in year k

CF_k: uniform cross-sectoral correction factor in year k

Base years for activity data

For free allocation to be given to individual installations based on *ex-ante* benchmarks, historical activity data (production of benchmarked products) is needed for the calculations. The Directive specifies the years 2007-2008 as the starting point for the determination of the

[10] Data from other installations is only needed in case of application of the heat production benchmark.

benchmark values, while limiting the maximum free allocation in the Community based on share of non-electricity generator emissions in the period 2005-2007.

The selected period should meet following requirements:

- Data availability: Given that the final calculations on free allocation will be carried out in the first half of 2011, production data including 2009 and even 2010 may be available[11]. However, as the base years for the allocation shall be the same for all ETS installations more conservative assumptions regarding the data availability seem advisable.
- Downtimes of installations or their parts (e.g. due to maintenance activity or incidents) could have a significant impact on the activity data; to the extent this can be taken into account, it will increase equal treatment of all installations (e.g. average over a longer period).

Based on the base years for the benchmark values and the calculation of the maximum amount of free allocation and the need for a longer period, the average 2005-2008 is proposed for the activity data.

Exposure factor

The exposure factor is directly linked to the product for which free allocation is calculated. The Prodcom code of the benchmarked product and the related NACE code are used to determine whether the product is deemed to be exposed to a significant risk of carbon leakage or not (check of the NACE code related to the Prodcom code of the benchmarked product against the list of sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage). The list of sectors and sub-sectors which are deemed to be exposed to a significant risk of carbon leakage approved by Member States on 18 September 2009, will apply for the years 2013-2014, subject to the outcome of the international negotiations.

Following exposure factors are used for the third trading period:

Products	2013	2014	2015	2016	2017	2018	2019	2020
Exposed to CL risk	100%	100%	100%	100%	100%	100%	100%	100%
Not exposed	80.0%	72.9%	65.7%	58.6%	51.4%	44.3%	37.1%	30.0%

Linear reduction factor

The linear reduction factor (LRF) has been introduced by Art. 9 of the ETS Directive to ensure the annual reduction of the cap that in 2020 will be 21% below 2005 levels, and for the calculation of the cap as regards opt-ins, opt-outs and new sectors (Art. 9a). The LRF is explicitly required for all allocations from the New Entrants Reserve (Art. 10a (7)) and all allocations for district heating and high efficiency cogeneration as from 2014 (Art. 10a (4)).

The application of the LRF to the calculation of free allocation for all individual installations would ensure an equal treatment of new entrants and incumbents and ensure that an increasing proportion of allowances is auctioned, in line with recital 23 of the revised ETS Directive. It would give the same treatment for high-efficient co-generation as for other co-generation, avoiding incentives for higher GHG emissions. Article 10a (1) of the ETS Directive requires that the rules ensure that allocation takes place in a manner that provides incentives for reductions in greenhouse gas emissions. Furthermore, the carbon leakage

[11] PRODCOM production data are reported to Statistical Offices of Member States on a monthly basis, and published each month after the previous month has ended.

decision[12] which, as explained in its recital 12, is based on the assumption that the LRF is applied to any free allocation.

5.3. Fall-back approaches

In case no product benchmark is feasible, fall-back approaches can be used to nevertheless provide for a number of free allowances to be given:

- For emissions not related to combustion processes, grandfathering can be used (e.g. calcination processes)
- For combustion processes where a measureable heat carrier is produced that is subsequently used in a production process, the heat production benchmark can be used (e.g. boilers that produce steam and hot water).
- For combustion processes where the heat and / or mechanical energy is directly used in a production process without the intermediate production of a measurable heat carrier, the fuel mix benchmark can be applied (e.g. ovens, hot air dryers, and furnaces).

To cover, to the extent possible, the improvement factors in terms of GHG efficiency and in accordance with Art. 10a (1), 4th sub-paragraph ("*...the benchmark shall be calculated for products rather than for input, in order to maximise GHG reductions and energy efficiency savings throughout each production process*…"), the product benchmarks and three fall-back approaches would be used in the following hierarchical order:

	Fuel mix choice	**Combustion process efficiency**	**Heat end-use efficiency**
1 Product benchmarking	Included[1]	Included	Included
2 Heat production benchmarking	Included	Included	Not included
3 Fuel mix benchmarking	Included	Not included	Not included
4 Grandfathering	Not included	Not included	Not included

[1] "Included" means that potentials to improve on the corresponding factor and hence to reduce GHG emissions influenced by this factor are directly included in the approach
Source: Ecofys study November 2009

If a product benchmark is available, it would be applied for the calculation of the number of free allowances to be given to an installation. Only in the absence of a benchmark for a certain product, the heat used for the production of this product together with the heat-production benchmark would be used for the allocation (provided that the heat flows are measurable). If the heat flows are not measurable the fuel mix benchmark would be applied. Only in case no benchmark can be applied, grandfathering could be used as basis for free allocation.

Heat production benchmark

The number of free allowances for an installation based on the heat-production benchmark would be calculated as follows:

[12] Draft Commission Decision determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage (as approved by Member States on 18 September 2009). http://ec.europa.eu/environment/climat/emission/pdf/draft_dec_carbon_leakage_list16sep.pdf

$$F_H = \sum_{k=2013}^{2020} \left(\sum_{i=1}^{n} \left(BM_H \times HAL_i \times EF_{i,k} \times LF_{i,k} \right) \times CF_k \right)$$ Equation 3

BM_H: heat-production benchmark

HAL_i: historic activity level: historical heat consumption for production of product[13]

The heat production benchmark should be based on natural gas and an efficiency of at least 93% which appears to be the most efficient technology available. Using a reference efficiency of 90% contained in another Commission Decision, Commission Decision 2007/74/EC[14] would not be in line with the benchmark approach of the revised ETS Directive (average of the most efficient 10%).

For the activity level, the same base years as used for the allocation based on product benchmarks should be used.

Fuel mix benchmark

The number of free allowances for an installation based on the fuel-mix benchmark would be calculated as

$$F_F = \sum_{k=2013}^{2020} \left(\sum_{i=1}^{n} \left(BM_F \times HAL_i \times EF_{i,k} \times LF_{i,k} \right) \times CF_k \right)$$ Equation 4

BM_F: fuel-mix benchmark

HAL_i: historic activity level: historical fuel consumption for production of product i

The fuel mix benchmark is set at 56.1 t CO_2 / TJ fuel input. This benchmark value is based on natural gas as reference fuel. For the activity level the same base years as used for the allocation based on product benchmarks should be applied.

Grandfathering

A number of free allowances for an installation based on grandfathering would be calculated as follows:

$$F_G = \sum_{k=2013}^{2020} \left(\sum_{i=1}^{n} \left(HE_i \times IF \times EF_{i,k} \times LF_{i,k} \right) \times CF_k \right)$$ Equation 5

HE_i: historical emissions for the production of product i

IF: improvement factor

The improvement factor would ensure that allocation based on grandfathering is treated similar to benchmark-based allocation in terms of the share of free allowances compared to the historical emissions.

For the historical emissions, the same base years as used for the allocation based on product benchmarks should be applied.

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13 The activity levels needs at least to be calculated separately for products deemed to be exposed / not exposed to a significant level of carbon leakage.

14 Commission Decision 2007/74/EC establishing harmonised efficiency reference values for separate production of electricity and heat in the application of Directive 2004/8/EC on the promotion of cogeneration. OJ L 32, 6.2.2007, p. 183