EUROPEAN COMMISSION
DIRECTORATE-GENERAL
CLIMATE ACTION
Directorate B - European & International Carbon Markets

Guidance Document n°6
on the harmonized free allocation methodology for the EU-ETS
post 2012

Cross-Boundary Heat Flows

Final version issued on 14 April 2011

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1 Introduction

1.1 Status of the Guidance Documents

This guidance document is part of a group of documents, which are intended to support the Member States, and their Competent Authorities, in the coherent implementation throughout the Union of the new allocation methodology for Phase III of the EU ETS (post 2012) established by the Decision of the Commission [Date of adoption and OJ reference to be added when available] on "Transitional community-wide and fully harmonised implementing measures pursuant to Article 10a(1) of the EU ETS Directive" (CIMs) and developing the National Implementation Measures (NIMs).

The guidance does not represent an official position of the Commission and is not legally binding.

This guidance document is based on a draft provided by a consortium of consultants (Ecofys NL, Fraunhofer ISI, Entec). It takes into account the discussions within several meetings of the informal Technical Working Group on Benchmarking under the WGIII of the Climate Change Committee (CCC), as well as written comments received from stakeholders and experts from Member States. It was agreed that this guidance document reflects the opinion of the Climate Change Committee, at its meeting on 14 April 2011.

The guidance papers do *not* go into detail regarding the procedures that Member States apply when issuing greenhouse gas emissions permits. It is acknowledged that the approach to setting the installation boundaries laid down in GHG emissions permits differ between Member States.

1.2 Background of the CIM Guidance Documents

Specific topics were identified within the CIMs which deserve further explanation or guidance. The CIM guidance documents intend to address these issues as specific and clear as possible. The Commission considers it necessary to achieve the maximum level of harmonisation in the application of the allocation methodology for phase III.

The CIM guidance documents aim at achieving consistency in the interpretation of the CIMs, to promote harmonisation and prevent possible abuse or distortions of competition within the Community. The full list of those documents is outlined below:

In particular:

- Guidance document n. 1 – general guidance: this guidance gives a general overview of the allocation process and explains the basics of the allocation methodology.
- Guidance document n. 2 – guidance on allocation methodologies: this guidance explains how the allocation methodology works and its main features.
- Guidance document n. 3 – data collection guidance: this guidance explains which data are needed from operators to be submitted to the Competent Authorities

and how to collect them. It reflects the structure of the data collection template provided by the EC.

- Guidance document n. 4 – guidance on NIMs data verification: this guidance explains the verification process concerning the data collection for the National Implementation Measures[1].
- Guidance document n. 5 – guidance on carbon leakage: it presents the carbon leakage issue and how it affects the free allocation calculation.
- Guidance document n. 6 – guidance on cross boundary heat flows: it explains how the allocation methodologies work in case of heat transfer across the 'boundaries' of an installation.
- Guidance document n. 7 – guidance on new entrants and closures: this guidance is meant to explain allocation rules concerning new entrants as well as the treatment of closures.
- Guidance document n. 8 – guidance on waste gas and process emission sub-installation: this document provides for explanation of the allocation methodology concerning process emission sub-installation, in particular, concerning the waste gas treatment.
- Guidance document n. 9 – sector specific guidance: this guidance provides for detailed description of the product benchmarks as well as the system boundaries of each of the product benchmarks listed within the CIMs.

This list of documents is intended to complement other guidance papers issued by the European Commission related to Phase III of EU ETS, in particular:
- Guidance on Interpretation of Annex I of the EU ETS Directive (excl. aviation activities), and
- Guidance paper to identify electricity generators

References to Articles within this document generally refer to the revised EU ETS Directive and to the CIMs.

1.3 Use of the Guidance documents

The guidance documents give guidance on implementing the new allocation methodology for Phase III of the EU ETS, as from 2013: the Member States may use this guidance when they perform the data collection pursuant to Article 7 of the CIMs in order to define the complete list of installations as well as to calculate any free allocation to be determined for the National Implementing Measures (NIMs) pursuant to Article 11(1) of the Directive 2003/87/EC.

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[1] Article 11 of Directive 2003/87/EC

1.4 Additional guidance

Next to the guidance documents, additional support to the Member State authorities is provided in the form of a telephone helpdesk, and the EC-website, with list of guidance documents, FAQs and useful references, http://ec.europa.eu/clima/policies/ets/benchmarking_en.htm .

1.5 Scope of this guidance document

This guidance document describes allocation in case of heat flows over an installation boundary, where heat is defined as measurable heat.

The different types of heat flows discussed in this document are:

1. Heat flows from an ETS installation to another ETS installation or entity, such as a CHP plant selling heat to a pulp and paper plant.
2. Heat flows from an ETS installation to a non-ETS installation or entity, such as a CHP plant selling heat to a chocolate factory which has a total rated thermal input lower than 20 MW.
3. Heat flows from a non-ETS entity or installation to an ETS installation, such as a CHP plant which has a total rated thermal input lower than 20 MW selling the heat produced to a ceramics plant.
4. Heat flows involving multiple heat exporters and importers, such as several CHPs selling heat to a district heating network, which is distributing the heat in part to a dairy industry included in the ETS, in part to another dairy industry not included in the ETS, and in part to private households.

Heat flows from non-ETS entities or installations to other non-ETS entities or installations are not relevant for allocation and therefore not discussed in this document.

Heat flows between two sub-installations that are part of the same installation are relatively simple in terms of allocation. An example of allocation in case of internal heat flows in case of a paper mill, is given in the Section 5.

1.6 Principles of the treatment of cross-boundary heat flows

Net heat flows

For the purpose of allocation only measurable heat flows are of relevance[2]. See below for explanation of what is meant by net.

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[2] 'measurable heat' means a net 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 is or could be installed; (Commission Decision determining transitional Union-wide rules for the

Measurable heat flows have all of the following characteristics:
- *They are **net** meaning that the heat content in the condensate or transfer medium returning to the heat supplier is subtracted*
- *The heat flows **are transported through identifiable pipelines or ducts***

AND

- *The heat flows **are transported using a heat transfer medium**, e.g. steam, hot air, water, oil, liquid metals or salts*

AND

- *The heat flows **are or could in principle be measured by a heat meter** (where a heat meter is any device that can measure the amount of energy produced based upon flow volumes and temperatures)*

In the case of cross-boundary heat flows, the scope of the historical activity level for heat benchmark sub-installations often determines the free allocation. The legal definition of this historical activity level is quite complex[3]. For the purpose of cross-boundary heat flows, its scope can be summarized as:

*The measurable heat **produced** by ETS installations and:*
- ***consumed** within the installation's boundaries*

OR

- ***exported** to non-ETS entities*

***unless** it is used for the production of electricity or for the production of mechanical energy that is used for the production of electricity*

No distinction between different origins of heat
No distinction is made between heat from different sources (e.g. produced from different fuels, produced by boilers or CHP, heat as by-product of a benchmarked production process, etc.).

In principle, heat is eligible for free allocation if it can be regarded as covered by the ETS and if it is not produced via electric boilers. This is in particular likely to be the case for measurable heat directly linked (combustion process or exothermic production process) to source streams which are contained in the monitoring plan (MP) of an installation covered by the EU ETS.

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harmonized free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC, Art 3 (e))

[3] "The heat-related historical activity level shall refer to the median annual historical import from an installation covered by the Union scheme, production, or both, during the baseline period, of measurable heat consumed within the installation's boundaries for the production of products, for the production of mechanical energy other than used for the production of electricity, for heating or cooling with the exception of the consumption for the production of electricity, or exported to installations or other entity not covered by the Union scheme with the exception of the export for the production of electricity expressed in terajoule per year" (Commission Decision determining transitional Union-wide rules for the harmonized free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC) Art 9(3))

Exceptions to this rule are the following:

- The export or consumption of heat produced in the nitric acid production process is not eligible for free allocation as this heat is already taken into account by the nitric acid benchmark. (see Art 10 (6) of the CIMs)
- The consumption of heat produced by a non-ETS plant or unit (not covered by a GHG permit) is not eligible for free allocation. (see Art. 9 (3) and Art. 13 of the CIMs)
- The export or consumption of heat used for electricity generation is not eligible for free allocation. (see Art. 3 (c) and 9 (3) of the CIMs)

Example 1: An ETS installation that produces paper consumes steam from a 40 MW CHP unit that is covered by the same GHG permit. In this case, the heat consumed by installation is eligible for free allocation either under the product benchmark sub-installation (if any) or the heat benchmark sub-installation.

Example 2: An ETS installation that produces paper consumes heat from an external 5 MW boiler that is not covered by an EU ETS permit. In this case, the heat delivered to the EU ETS installation is not eligible for allocation.

Example 3: An ETS installation that produces paper consumes heat from an electric boiler: the electric boiler is not covered by EU ETS (the installations' EU ETS permit boundaries should not include it). In this case, the corresponding amount of heat is not eligible for allocation.

Example 4: Within an ETS installation, heat from a nitric acid production process is used in fertilizer production that is covered by the same permit. In this case, the heat delivered from the nitric acid sub-installation is not eligible for free allocation.

Example 5: A carbon black plant[4] recovers heat from the exothermic production process and delivers it to a district heating network. In this case, the heat delivered to the district heating network is eligible for free allocation.

Example 6: A carbon black plant[4] recovers heat from the exothermic production process and delivers it to a CHP unit co-fired with natural gas and covered by the same EU ETS permit. The CHP delivers heat and electricity to a district heating network and the grid. In this case, the heat produced by the CHP installation is eligible for free allocation. The produced electricity, which is partly produced using exothermic heat is not eligible for free allocation.

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[4] For the production of carbon black the plant in the example is allocated based on a product benchmark sub installation

Significant changes in heat flows after 1 January 2005
The definition of significant capacity changes is given in article 3(i), (j) and (k) of the CIMs and is explained in section 4.1 for the case of a heat benchmark sub-installation.

Significant changes between 1 January 2005 and 30 June 2011 impact the historical activity level. These changes are discussed in guidance document 2.

Changes after 30 June 2011 are subject to new entrant/closure regulations and are discussed in guidance document 7.

List of technical connections
Each operator should clearly list its technical connections. All connected installations and entities have to be identified and notified to the competent authorities. *See Guidance Document 3 on Data Collection* for *further guidance on data reporting.*
All data including those on or provided by non-ETS entities related to cross-boundary heat flows are subject to independent verification.

2 Heat flows between one heat exporter and one heat importer

2.1 Heat flows between two ETS installations

This section discusses the allocation in case of heat flows from one installation to another installation, where both installations are in the EU-ETS.

Schematic

Figure 1 shows the situation discussed in this section.

Figure 1. Heat flows from an ETS installation to another ETS installation
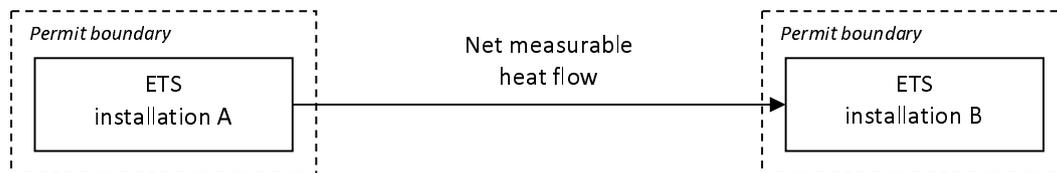
Preliminary allocation

As a general rule, free allocation is given to the heat consuming installation. An overview of the preliminary allocation is given Table 1.

Carbon leakage exposure factor

The carbon leakage factor to be used is the carbon leakage exposure factor for the heat consumer, i.e. the importing sub-installation.

Table 1. Overview of preliminary allocation in case of a heat flow from one ETS installation to another ETS installation

Preliminary allocation to heat exporting installation A	Preliminary allocation to heat importing sub-installation B
No allocation is given to the heat producer The part of the ETS installation that exports heat to other ETS installations does not receive any allowances for the heat export	*The heat importing sub-installation is a product benchmark sub-installation* The imported heat is taken into account in the product benchmark. $$F_{P,preliminary} = BM_P \cdot HAL_P \cdot EF_C$$ *Allocation = Product Benchmark x amount of Product produced x Carbon leakage exposure factor of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne/year) EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is not a product benchmark sub-installation The heat imported from ETS installations is taken into account in the historical activity level of the heat importing sub-installation: $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF_C$$ *Allocation = Heat Benchmark x Heat consumed x Carbon leakage exposure factor of the heat consumer* where: $F_{H,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the median annual heat consumed over the baseline period. EF_C: carbon leakage exposure factor of the heat consumer

## 2.2 Heat flows from an ETS installation to a non-ETS installation or entity

This section discusses allocation in case heat flows from an installation that is in the EU ETS to an entity that is not in the EU-ETS since it does not perform an activity listed in Annex I of the EU ETS Directive, e.g. a heat producing installation delivers its heat to private households through a district heating network.

Schematic
Figure 2 below shows the situation discussed in this section:

Figure 2. Heat flows from an ETS installation to a non-ETS installation
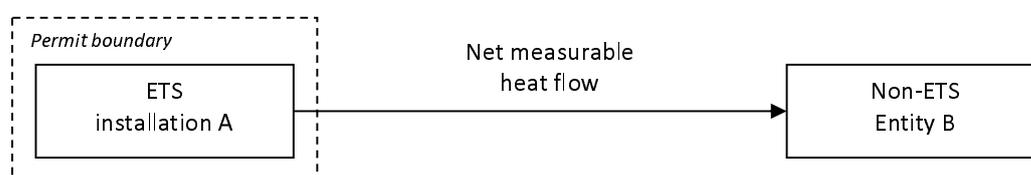
Preliminary allocation
In this situation, free allowances are given to the heat producer for the heat exported. An overview of the preliminary allocation is given in Table 2.

Carbon leakage exposure factor
The non-ETS entities are by default deemed not exposed to carbon leakage. The carbon leakage exposure factor for carbon leakage exposed sectors can only be used if the heat exporter provides satisfactory evidence that it exports heat to a non-ETS entity that is exposed to a significant risk of carbon leakage: the operator will for example provide a list of his customers consuming the heat, along with the NACE codes of these customers and the amounts of heat delivered to them.

If the heat is exported to more than one non-ETS entity with different exposure factors, then the heat exporting sub-installation needs to be split in two sub-installations. Section 3.1 considers this situation in more detail.

Private households
A special situation exists if the non-ETS entity consists of private households and ETS installations provide heat to these private households. The respective allocation for this situation is described in chapter 3.3.

Table 2. Overview of preliminary allocation in case of a heat flow from an ETS installation to a non-ETS entity

Preliminary allocation to heat exporting sub-installation A	Preliminary allocation to non-ETS heat importer B
The heat exporting sub-installation by definition is a heat benchmark sub-installation The heat exported to non-ETS entities is taken into account in the historical activity level of the heat exporting sub-installation.[5] $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF$$ *Allocation = Heat Benchmark x amount of net exported Heat x Carbon leakage exposure factor* where: $F_{H,preliminary}$: annual preliminary allocation to the heat exporting sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the median annual measurable heat produced and exported to non-ETS entity over the baseline period, unless used for electricity production. EF The carbon leakage exposure factor for non-carbon leakage exposed sectors is used as, unless the heat exporter provides evidence that it exports heat to a non-ETS entity that is exposed to a significant risk of carbon leakage.	Non-ETS entities cannot receive free allocation

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[5] If heat is exported to private households, specific allocation rules may apply. In this case, the respective amount of heat exported to private households has to be subtracted from the total amount of exported heat, before the application of the carbon leakage factor. See chapter 3.3 for details.

2.3 Heat flows from a non-ETS entity to an ETS installation

This type of heat flow occurs when a heat importing installation is in the EU ETS and receives heat from a heat exporter that is not in the EU ETS because it does not perform an activity listed in Annex I of the EU ETS Directive. This can for example be:
- An installation for the incineration of municipal waste selling the heat produced to a ceramics plant
- A 5 MW CHP selling the heat produced to a mineral wool plant

Schematic
Figure 3 below shows the situation discussed in this section:

Figure 3. Heat flows from a non-ETS entity to an ETS installation
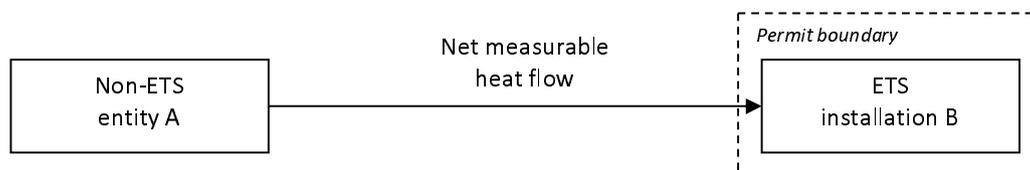
Preliminary allocation
The consumption of heat produced outside ETS is not eligible for free allocation. An overview of the preliminary allocation is given in Table 3

Carbon leakage exposure factor
The carbon leakage exposure factor to be used is the carbon leakage exposure factor for the heat consuming sub-installation.

Table 3. Overview of preliminary allocation in case of a heat flow from a non-ETS installation to a ETS installation

Preliminary allocation to non-ETS heat producer A	Preliminary to heat importing sub-installation B
Non-ETS entities can not receive free allocation	*The heat importing sub-installation is a product benchmark sub-installation* The imported heat is not eligible for free allocation. The imported heat is however taken into account by the product benchmark. The allocation therefore needs to be corrected for the amount of imported heat. $$F_{P,preliminary} = (BM_P \cdot HAL_P - BM_H \cdot H_{import}) \cdot EF_C$$ *Allocation = (Product Benchmark x amount of Product produced – Heat Benchmark x Heat consumed) x Carbon leakage factor of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne) BM_H: heat benchmark (expressed in EUA/TJ) H_{import}: the heat import in the same base years as used for HAL_P (expressed in TJ/year) EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is not a product benchmark sub-installation The heat imported from non ETS entities is not taken into account in the determination of the historical activity level. As a consequence, the heat benchmark sub-installation does not receive any allowances for the heat imported from non-ETS entities.

3 Heat flows involving multiple heat exporters and importers

This section discusses situations in which more than one heat exporters or importers are involved

3.1 One heat exporter and multiple heat importers

This section considers the case in which one ETS installation exports heat to both ETS installations and non-ETS entities with different carbon leakage exposure factors.

Schematic
Figure 4 shows the situation discussed in this section. The heat exporting installation needs to be divided in different sub-installations (see guidance document 5 on Allocation Methodologies)

Figure 4. An ETS installation exports heat to both ETS sub-installations and non-ETS entities with different carbon leakage exposure factors.
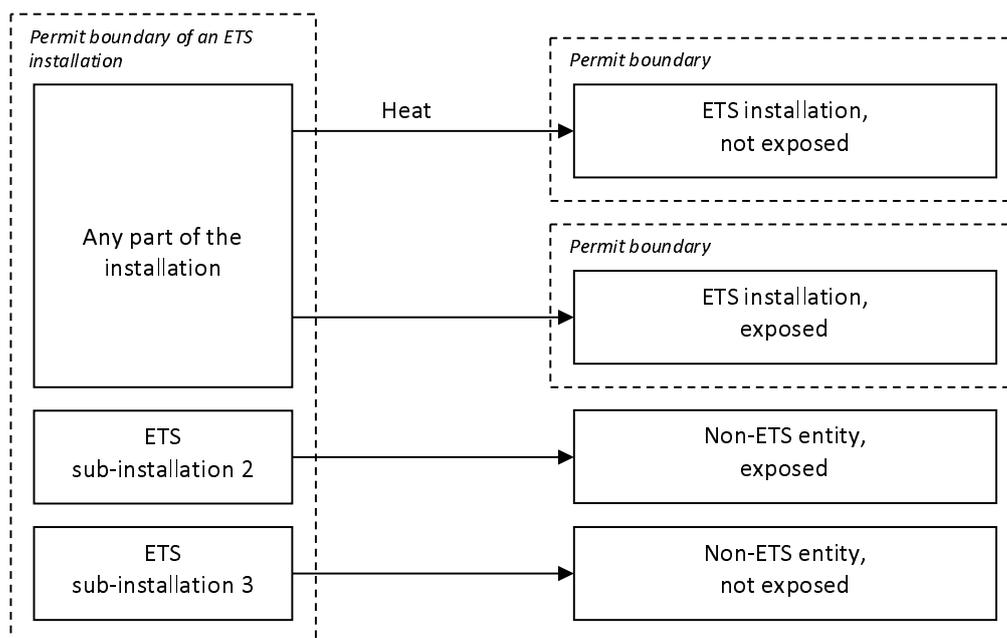
Preliminary allocation
The preliminary allocation is shown in Table 4 and is determined using the cases as discussed in sections 2.1and 2.2 as building blocks:
- Heat export by an ETS installation to sub-installations that are part of other ETS installations were discussed in section 2.
- Heat flows from sub-installations 2 and 3 to non-ETS entities are of the type discussed in section 2.2.

Carbon leakage exposure factor

For the ETS heat consumers the carbon leakage exposure factor to be used is the exposure factor of the heat consuming sub-installation.

The non-ETS entities are by default deemed not exposed to carbon leakage. The carbon leakage exposure factor for carbon leakage exposed sectors can only be used if the heat exporter provides satisfactory evidence that it exports heat to a non-ETS entity that is exposed to a significant risk of carbon leakage: the operator will for example provide a list of his customers consuming the heat, along with the NACE codes of these customers and the amounts of heat delivered to them.

Table 4. Overview of preliminary allocation in case an ETS installation exports heat to both ETS sub-installations and non-ETS consumers with different exposure factors.

Exporter/importer	Preliminary allocation
ETS heat exporter: any part of instal.	The part of the ETS installation that exports heat to other ETS installations does not receive any allowances for the heat produced and exported
ETS heat importer, not exposed	*The heat importing sub-installation is a product benchmark sub-installation* The imported heat is taken into account in the product benchmark. $$F_{P,preliminary} = BM_P \cdot HAL_P \cdot EF_C$$ *Allocation = Product Benchmark x amount of Product produced x Carbon leakage factor of heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne/year) EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is not a product benchmark sub-installation The heat imported from ETS installations is taken into account in the historical activity level of the heat importing sub-installation: $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF_C$$ *Allocation = Heat Benchmark x amount of Heat consumed x Carbon leakage factor of heat consumer* where: $F_{H,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the median annual historical heat produced and consumed by ETS installations over the baseline period EF_C: carbon leakage exposure factor of the heat consumer
ETS heat importer, exposed	Idem as ETS heat importer, not exposed

ETS heat exporter: sub-installation 2	*The heat exporting sub-installation by definition is a heat benchmark sub-installation*
	The heat exported to non-ETS entities is taken into account in the historical activity level of the heat exporting sub-installation:
	$$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF$$
	Allocation = Heat Benchmark x amount of net exported Heat x Carbon leakage factor
	where:
	$F_{H,preliminary}$: annual preliminary allocation to the heat exporting sub-installation (expressed in EUAs/year)
	BM_H: heat benchmark (expressed in EUAs/TJ)
	HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the annual median historical heat produced and exported to non-ETS entities over the baseline period, unless used for electricity production.
	EF The carbon leakage exposure factor for non-carbon leakage exposed sectors is used as, unless the heat exporter provides evidence that it exports heat to a non-ETS entity that is exposed to a significant risk of carbon leakage
Non-ETS importer, exposed	Non-ETS entities can not receive free allocation
ETS heat exporter: sub-installation 3	Idem as ETS heat exporter: sub-installation 2
Non-ETS importer, not exposed	Non-ETS entities can not receive free allocation

3.2 Heat flows from an ETS exporter to a heat distributor

This section discusses allocation in the case of heat flows from an ETS installation to a heat distributor which distributes heat to both ETS and non-ETS consumers.

Definition of a heat distributor
A heat distributor is an entity which acts as an intermediary between heat producers and the heat consumers. This means that:
- The distributor is neither producing nor consuming the heat.
- There is no direct contractual relation between the heat producer and the heat consumers concerning the delivery of heat.

Despite the existence of an intermediate party in that distributed heat there may exist direct heat delivery contracts between heat producers and consumers. In that case, the intermediate party is not considered as a heat distributor and the standard rules for heat flows apply (allocation to ETS heat consumers unless heat is imported from non-ETS heat producers, allocation to ETS heat producers if consumers are not covered by the ETS, see section 2).

The installation that acts as an intermediate party may also be producing heat itself. In such cases the installation will be virtually split into two parts: an ETS heat exporter and a heat distributor which transfers heat (including the part of the own heat production) from a producer to a consumer. Therefore, the standard rules for heat flows also apply for that specific amount of heat (allocation to ETS heat producer as the heat is regarded as delivered to a non-ETS entity, see section 2.2).

Schematic
Figure 5 below shows the situation discussed in this section:

Preliminary allocation
For the purpose of allocation, the heat distributor is regarded as a non-ETS entity. Consequently, free allowances are given to the heat producer for the heat exported to the heat distributor. Installations and entities receiving heat from the heat distributor do not receive free allocation. An overview of the preliminary allocation is given in Table 5 .

The allocation rule for heat flows from ETS heat exporters to a non-ETS heat distributor is applied independently from the number of heat producers and consumers (see also section 3.4 for a more complex network).

Figure 5. Heat flows from an ETS installation to a non-ETS distributor
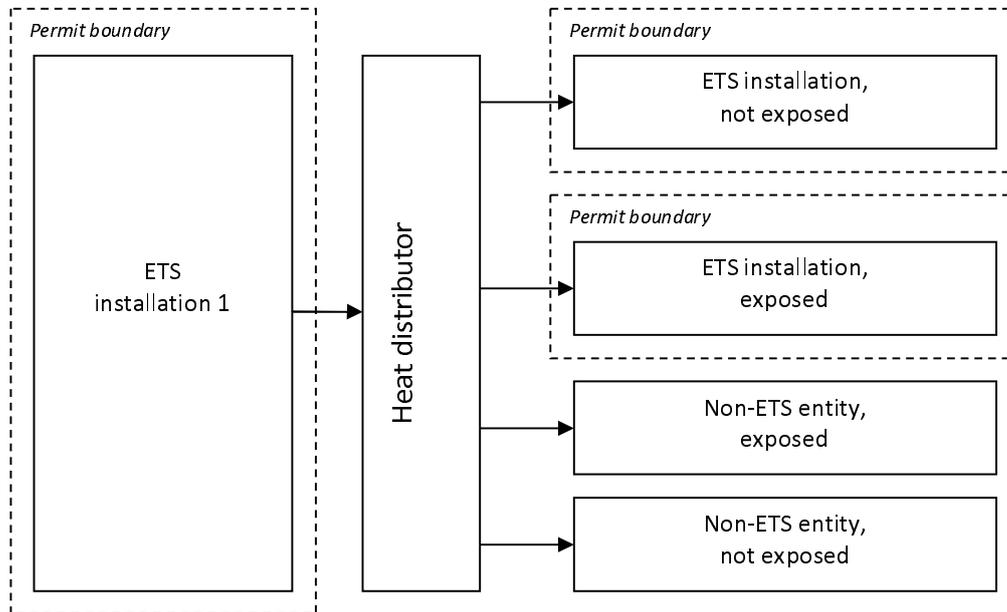
Carbon leakage exposure factor

The carbon leakage exposure factor to be used is the carbon leakage factor for non-carbon leakage exposed sectors unless evidence on the carbon leakage exposure of the heat consumer can be provided (amounts of heat delivered and Prodcom/ NACE codes of the consumers).

Such data can only be delivered by the heat distributor on a voluntary basis as there are no legal obligations for these entities in the context of the data collection. Following data are in principle needed and should be provided to the ETS installations concerned:

- Amount of heat to non-ETS-installations or entities (not private households, differentiated: CL-/non-CL exposed) and
- Amount of heat to private households.

Table 5. Overview of preliminary allocation in case ETS installation exports heat via a non-ETS heat distributor to heat importers

Exporter/ importer	Preliminary allocation
ETS exporter	*The heat exporting sub-installation by definition is a heat benchmark sub-installation* The heat exported to the heat distributor (a non-ETS entity) is taken into account in the historical activity level of the heat exporting sub-installation: $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF$$ *Allocation = Heat Benchmark x amount of net exported Heat x Carbon leakage factor* where: $F_{H,preliminary}$: annual preliminary allocation to the heat exporting sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the annual median historical heat produced and exported to non-ETS entities over the baseline period, unless used for electricity production. EF The carbon leakage exposure factor for non-carbon leakage exposed sectors is used, unless evidence on the carbon leakage exposure of the heat consumer can be provided
Heat distributor	Heat distributors are regarded as non-ETS entities and can not receive free allocation (in case the heat distributer produces and exports heat, the heat exporting part receives allocation as ETS exporter).
ETS consumers	*The heat importing sub-installation is a product benchmark sub-installation* The imported heat is not eligible for free allocation since it comes from a non-ETS entity. The imported heat is however taken into account by the product benchmark. The allocation therefore needs to be corrected for the amount of imported heat. $$F_{P,preliminary} = (BM_P \cdot HAL_P - BM_H \cdot H_{import}) \cdot EF_C$$ *Allocation = (Product Benchmark x amount of Product produced* *− Heat Benchmark x Heat consumed) x Carbon leakage factor of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne) BM_H: heat benchmark (expressed in EUA/TJ) H_{import}: the heat import in the same base years as used for HAL_P (expressed in TJ/year)

	EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is not a product benchmark sub-installation
	The heat imported from non ETS entities is not taken into account in the determination of the historical activity level. As a consequence, the heat benchmark sub-installation does not receive any allowances for the heat imported from the heat distributor, a non-ETS entity.
Non-ETS consumers	Non-ETS entities can not receive free allocation

3.3   Heat flows from an ETS exporter to private households

A special situation exists if the non-ETS entity consists of private households and ETS installations provide heat to private households through a district heating network with or without an independent distributing entity

Definition and examples of private households
The Commission Decision, Article 3 (q), defines private households as follows:
"'private household' means a residential unit in which persons make arrangements, individually or in groups, for providing themselves with measurable heat;"

In practical terms, this means that private households are*:*

a. *Buildings* <u>*predominantly*</u> *used by individuals for residential purposes, e.g. houses, apartments, flats, bungalows, apartment buildings mostly used as residences)etc.*

b. *Buildings* <u>*partly*</u> *used by individuals for residential purposes, e.g. apartment buildings to the extend used as residences*

AND NOT

- *Any other buildings, e.g. hospitals, nursing homes, company buildings, shops, supermarkets, offices, municipal buildings, churches, banks, hotels, museums, schools, etc.*

Examples:

- *An apartment building with 25 apartments and 2 shops should be regarded as 'predominantly used by individuals for residential purposes' and the heat delivered to this building can be fully considered as delivered to private households.*

- *An apartment building with 15 apartments and 8 shops with a heat consumption in the same order of magnitude as an apartment should be regarded as 'partly used by individuals for residential purposes' and only the heat delivered to the 15 apartments can be considered as delivered to private households.*

Schematic
Figure 6 below shows the situation discussed in this section:

Figure 6. Heat flows from an ETS installation to a non-ETS distributor a non-ETS installation
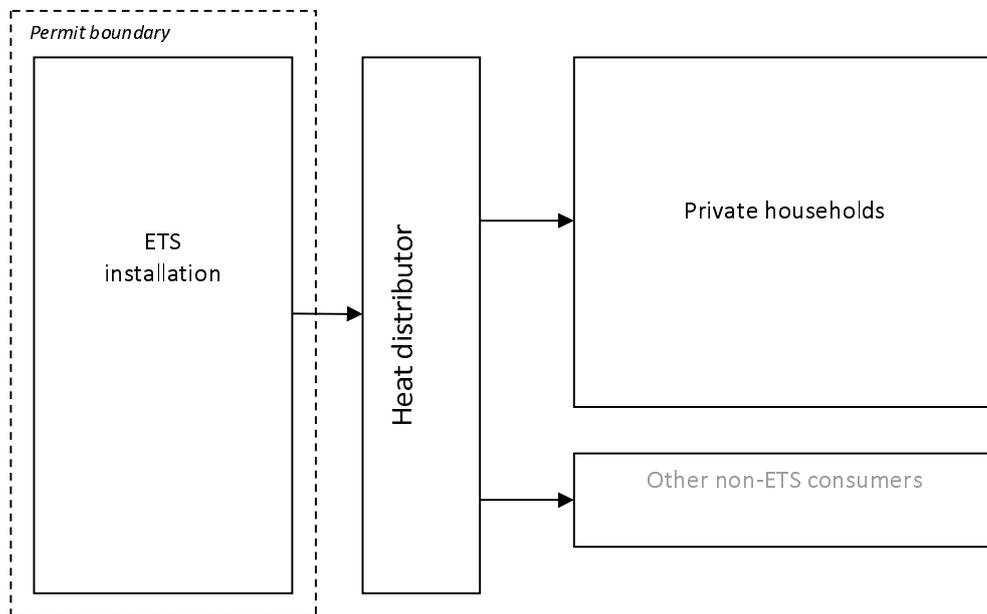
Preliminary allocation

According to the specific allocation rule for heat export to households, on request of an ETS heat exporter, the preliminary allocation (prior to the application of the CL exposure factor) to the ETS heat exporter in respect of the heat delivered to private households is the highest of the following[6]:

- The historical activity level for heat delivered to households (median of the historical annual heat delivery to households in the baseline period relevant of the installation) times the heat benchmark value,

OR

- The historical emissions related to heat delivered to households times a correction factor. The historical emissions are the median annual historical emissions in the period from 1 January 2005 to 31 December 2008. The correction factor is 100% in 2013, 90% in 2014 decreasing to 30% in 2020.

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[6] "To the extent that measurable heat is exported to private households and the preliminary annual number of emission allowances determined in accordance with paragraph 2(b), point (i), for 2013 is lower than the median annual historical emissions related to the production of measurable heat exported to private households by that sub-installation in the period from 1 January 2005 to 31 December 2008, the preliminary annual number of emission allowances for 2013 shall be adjusted by the difference. In each of the years 2014 to 2020, the preliminary annual number of emission allowances determined in accordance with paragraph 2(b), point (i), shall be adjusted to the extent that the preliminary annual number of emission allowances for that year is lower than a percentage of the abovementioned median annual historical emissions. This percentage shall be 90% in 2014 and decline by 10% each subsequent year. (Commission Decision determining transitional Union-wide rules for the harmonized free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC) Art 10(3))

This specific rule is only relevant for cases where the specific emission related to the production of heat are higher than the level of the heat benchmark value as otherwise the calculation will not result in additional allocation. The heat benchmark value is based on the use of natural gas and a conversion efficiency of 90%. Emissions will therefore typically be higher than the level of the heat benchmark in case of lower efficiencies than 90% and/or less GHG efficient fuel than natural gas.

The preliminary allocation is defined in more detail in Table 6.

Determination of heat delivered to private households
This specific rule can be applied only if satisfactory evidence has been provided on the amount of heat sold to private households: the heat producer has to provide annual sales figures (for the entire baseline period) clearly indicating the amount of heat sold to private households and/or buildings which are predominantly used for residential purposes. For heat delivered to buildings only partly used for residential purposes, only the amount of heat sold to private households may be considered.

In case no historical data on the heat delivery to private households is available within the framework of the baseline data collection, the amount of heat delivered from a heat producer to private households should be estimated based on:
- The total amount of low temperature heat (usually <130°C design temperature at producer's entry point into the district heating network) delivered to district heating *and*.
- the share of heat typically delivered to private households in district heating networks. This share should be 80% of the percent value of the national average share of heat delivered to private households in district heating networks according to appropriate national statistical data.

If no data is available and it is not possible to make an estimate in accordance with the above, then the household rule may not apply. See the examples provided here-after for more guidance on how and when the rule applies.

The specific rule for heat delivered to private household applies in case of direct contractual relations between the heat producer and the consumers/ private households as well as in case of third parties operating the district heating network.

It is important to underline that for district heating networks only the share of heat delivered to private households is subject to this special provision.

Determination of emissions related to heat delivered to private households
The household rule is independent from the heat source (boiler, CHP, excess heat from industrial processes).

The historical emissions related to heat delivered to private households are calculated as median of the respective annual emissions from 2005 to 2008. These annual values are determined by multiplying the historical annual emissions of the heat production with the share of heat delivered to private households.

When heat is delivered by a CHP to private households, it may be difficult to determine historical values for emissions related to heat consumed by private households as the total emissions need to be split into a heat-related and an electricity-related part.

In determining the amount of emissions related to heat production for private households, note that in the case of CHP units only the amount of CHP-fuel input attributable to usable CHP heat production should be taken into account. Therefore the emissions related to CHP heat production ($Em_{CHP,Heat}$) is calculated from the total emissions of the CHP[7] (Em_{CHP}) as follows[8]:

$$Em_{CHP,Heat} = Em_{CHP} \cdot \frac{\eta_{heat}/\eta_{ref,heat}}{\eta_{el}/\eta_{ref,el} + \eta_{heat}/\eta_{ref,heat}}$$

Where:

$Em_{CHP,Heat}$	is the emissions allocated to the production of CHP heat
Em_{CHP}	is the total emissions caused by CHP-fuel input
η_{heat}	is the efficiency of the heat production (=CHP heat / CHP-fuel input)
$\eta_{ref,heat}$	is the reference efficiency of a stand-alone boiler
η_{el}	is the efficiency of the electricity production (=CHP electricity / CHP-fuel input)
$\eta_{ref,el}$	is the reference efficiency of electricity production without CHP.

The efficiencies η_{heat} and η_{el} will be based either on technical documentation (design values) of the installation, or on suitable measurements which have been independently verified. If neither of these approaches are feasible, conservative default values of η_{heat} = 0.7 and η_{el} = 0.525 should be used.

The reference efficiencies $\eta_{ref,heat}$ and $\eta_{ref,el}$ to be used are shown in the table below.

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[7] The formula only relates to fuel and related emissions of a CHP working in combined (both producing electricity and heat) mode, reflected in "CHP heat", "CHP electricity" and "CHP fuel input". Fuel and related emissions which refer to non-combined (only producing heat or electricity) operational mode shall not be taken into account in this calculation.

[8] This methodology is compatible with the methodology as used for the purpose of implementing Article 10c of the revised ETS Directive (see Annex IIa of Commission Decision on guidance on the methodology to transitionally allocate free emission allowances to installations in respect of electricity production pursuant to ARticle 10c(3) of Directive 2003/87/EC.

Table 6.	Reference efficiency values for electricity and heat production; Based on standard efficiency values taken from Commission Decision of 21 December 2006 establishing harmonised efficiency reference values for the separate production of electricity and heat in application of Directive 2004/8/EC of the European Parliament and of the Council

	Hard coal/ coke	Lignite/ lignite briquettes	Gas oil, fuel oil, LPG	Natural gas
Electricity (values for 2006-2011)	44.2%	41.8%	44.2%	52.5%
Steam, hot water	88%	86%	89%	90%

If not all the measurable heat from a certain boiler or CHP is delivered to households, because the heat is consumed by several installations or sub-installations, the amount of emissions related to the heat export for households (*Emissions$_{households}$*) is determined as follows:

$$Emissions_{Households} = Emissions_{Heat} \cdot \frac{Q_{Households}}{Q_{Produced}}$$

$Q_{Households}$ is the amount of heat exported to households.

$Q_{produced}$ is the total amount of heat produced in this boiler or CHP under consideration.

Carbon leakage exposure factor

The carbon leakage exposure factor to be used for heat delivered to private households is the carbon leakage factor for non-carbon leakage exposed sectors.

For the other non-ETS consumers, the carbon leakage exposure factor to be used is the carbon leakage factor for non-carbon leakage exposed sectors unless evidence on the carbon leakage exposure of the heat consumer can be provided (amounts of heat delivered and Prodcom/ NACE codes of the consumers).

Table 7. Overview of preliminary allocation in case ETS installation exports heat via a non-ETS heat distributor to private households

Exporter/ importer	Preliminary allocation
ETS exporter	*The heat exporting sub-installation by definition is a heat benchmark sub-installation* $$F_{H,preliminary,households} = MAX(BM_H \cdot HAL_{H,households}, HF \cdot Emissions_{households}) \cdot EF_{Non-exposed}$$ *Allocation = Maximum of ((Heat Benchmark x amount of net exported heat) or (households correction factor x historical emissions for households heat production)) x Carbon leakage factor* where: $F_{H,preliminary,households}$: annual preliminary allocation to the heat exporting sub-installation for the heat exported to households (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) $HAL_{H,households}$: the median annual historical heat export to households during the baseline period (expressed in TJ/year) $Emissions_{households}$: the median annual historical emissions related to the production of the measurable heat for households in the period from 1 January 2005 to 31 December 2008. HF: Households correction factor: 100% in 2013, 90% in 2014 , 80% in 2015, 70% in 2016, 60% in 2017, 50% in 2018, 40% in 2019 and 30% in 2020. $EF_{non-exposed}$: The carbon leakage factor for non-exposed sectors --
Heat distributor	Heat distributors are regarded as non-ETS entities and can not receive free allocation
Private households	Private households are non-ETS entities and therefore can not receive free allocation
Other non-ETS consumers	Non-ETS entities can not receive free allocation

Examples for heat flows from an ETS installation to private households

Example A
An example installation performs the activities as defined in Table 7.
- The ETS installation does not produce any products that are covered by a product benchmark.
- The installation is part of a sector deemed to be exposed to a significant risk of carbon leakage
- Households are by default not deemed exposed to a significant risk of carbon leakage.

Table 8. Relevant activity data for an example plant

	2005	2006	2007	2008	2009	2010
Heat production for own consumption (TJ)	10	11	10	12	9	9
Heat production for households (TJ)	2	1.9	2	2.1	2.5	2.5
Emissions related to heat for households (tCO$_2$)	200	190	200	210	250	250

Division in sub-installations
The installation is divided in two sub-installations:
- Heat benchmark sub-installation 1, exposed to Carbon Leakage (which includes the consumption of heat produced by the ETS installation)
- Heat benchmark sub-installation 2, not exposed to Carbon Leakage (which includes the heat exported to households)

Preliminary allocation to heat benchmark sub-installation 1
Regardless of the amount of heat exported to households, heat benchmark sub-installation 1 will have an annual preliminary allocation as follows:

$$F_{HeatCL} = BM_H \cdot HAL_{ConsumedHeat} \cdot EF_{Consumer}$$
Allocation = Heat Benchmark x amount of consumed heat

with:
F_{HeatCL} annual preliminary allocation for consumed heat (expressed in EUAs/year)
BM_H heat benchmark (62.3 EUAs/TJ)
$EF_{Consumer}$ the carbon leakage factor of the heat consumer, in this case the carbon leakage factor for exposed sectors.

$HAL_{ConsumedHeat}$ the heat-related historical activity level (expressed in TJ/year); i.e., the heat produced and consumed by the installation unless used for electricity production.

     Art 9(1) of the Decision states that the baseline period for the historical activity level is:

- 1 January 2005 to 31 December 2008

or, if it would lead to a higher level (for the whole installation):

- 1 January 2009 to 31 December 2010

So, the baseline period to choose would be 1 January 2005 to 31 December 2008 leading to a historical activity level for heat benchmark sub-installation 1 of 10.5 TJ

Considering the above, the annual preliminary allocation for heat benchmark sub-installation 1 would be:

$$F_{HeatCL} = BM_H \cdot HAL_{ConsumedHeat} \cdot EF_{Exposed} = 62.3 \cdot 10.5 \cdot 1 = 654 EUA$$

Preliminary allocation to heat benchmark sub-installation 2
As explained in this chapter, the allocation for heat exported to households would be:

$$F_{HeatnonCL} = MAX(BM_H \cdot HAL_{H,households}, HF \cdot Emissions_{households}) \cdot EF_{Non-exposed}$$

where:

$F_{HeatnonCL}$	annual preliminary allocation to the heat exporting sub-installation (expressed in EUAs/year)
BM_H	heat benchmark (62.3 EUAs/TJ)
$HAL_{H,households}$	the median annual historical heat export to households during the baseline period (expressed in TJ/year),
	As 2005-2008 is used for this installation, this same baseline will be used for heat benchmark sub-installation 2, leading to a historical activity level of 2 TJ.
$Emissions_{households}$:	the median annual historical emissions related to the production of the measurable heat for households in the period from 1 January 2005 to 31 December 2008 Table 8 shows that the median annual historical emissions are 200 tCO_2
HF:	Households correction factor: 100% in 2013, 90% in 2014, 80% in 2015, 70% in 2016, 60% in 2017, 50% in 2018, 40% in 2019 and 30% in 2020.
$EF_{Non-exposed}$:	The carbon leakage factor for non-exposed sectors

Table 8 shows the resulting preliminary allocation.

Table 9. Preliminary allocation to sub-installation exporting heat to households

	2013	2014	2015	2016	2017	2018	2019	2020
$BM_H \cdot HAL_{H,households}$	124.6	124.6	124.6	124.6	124.6	124.6	124.6	124.6
$HF \cdot Emissions_{households}$	200	180	160	140	120	100	80	60
$F_{H,households.,}$before before considering EF	200	180	160	140	124.6	124.6	124.6	124.6
$EF_{Non-exposed}$	0.8000	0.7286	0.6571	0.5857	0.5143	0.4429	0.3714	0.3000
$F_{H,preliminary,households}$	160	131.14	105.14	82.00	64.08	55.18	46.28	37.38

*The values of EF (k) in the non exposed case for each year k (from 2013 up to 2020) are calculated as: EF(k) = 0.5/7 * (2020 - k) + 0.3. The values in the table have rounded up and are given as an indication only.*

Example B

Figure 7. Example B: heat delivered to private households and to other non-ETS customers through a district heating network, with one heat producer

Net measurable heat flow   Net measurable heat flows

Permit boundary

ETS installation X → District heating network → Private households / Other customers
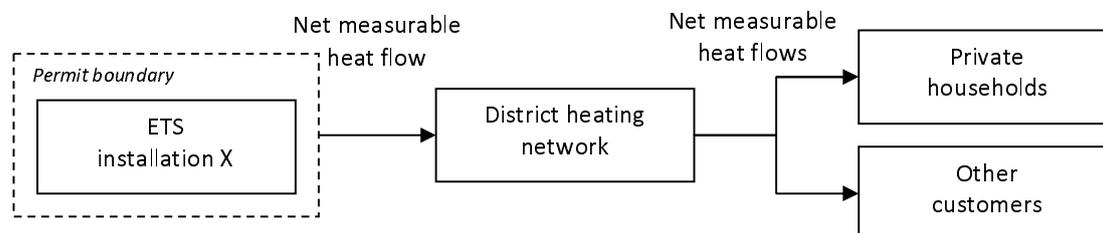
Assumptions:
Median of the annual amount of heat exported to private households from 1 January 2005 to 31 December 2008 = 100 000 GJ/year
Median annual historical CO_2 emissions related to the production of the heat exported to the private households from 1 January 2005 to 31 December 2008 = 10 000 tCO_2/year

In example B, installation X is the sells 200 TJ of heat to the district heating network, which distributes it evenly over households and other non-ETS consumers. Installation X can provide the PRODCOM codes of the consumers and can therefore prove that the consumers are exposed to carbon leakage:

	2013	2014	2015	2016	2017	2018	2019	2020
To households	100	100	100	100	100	100	100	100
To other consumers	100	100	100	100	100	100	100	100

Calculating the amount of heat produced by installation X and ultimately sold to private households is therefore in principle feasible based on data from the district heating network. The rule on private households will be applicable to the share of heat delivered to private households.

In order to calculate the preliminary allocation regarding the heat for private households for installation X in example B, the amounts in the second and third row of Table 9 will be calculated. For each year, the highest amount between the two rows will give the allocation before application of the exposure factor (*EF*). In this case, the amount in third row will be used for years 2013 to 2016 and the amount in the second row for years 2017 to 2020.

Table 10. Calculating the preliminary allocation regarding the heat delivered to private households for installation X in example B

	2013	2014	2015	2016	2017	2018	2019	2020
$BM_H \cdot HAL_{H,households}$	6230	6230	6230	6230	6230	6230	6230	6230
$HF \cdot Emissions_{households}$	10000	9000	8000	7000	6000	5000	4000	3000
$F_{H,households.,}$before before considering EF	10000	9000	8000	7000	6230	6230	6230	6230
$EF_{Non-exposed}$	0.8000	0.7286	0.6571	0.5857	0.5143	0.4429	0.3714	0.3000
$F_{H,preliminary,households}$	8000	6557	5257	4100	3204	2759	2314	1869

*The values of EF (k) in the non exposed case for each year k (from 2013 up to 2020) are calculated as: EF(k) = 0.5/7 * (2020 - k) + 0.3. The values in the table have rounded up and are given as an indication only.*

For the heat delivered to other customers, the calculation rules as described in chapter 3.2 apply. Since the consumers are not covered by the ETS, the allocation goes to installation X. By default, the carbon leakage exposure factor for non-carbon leakage exposed sectors would apply for export to non-ETS consumers. In this case however, installation X can provide evidence that half of the heat delivered the heat distributor goes to consumers that are exposed to carbon leakage. The allocation for the heat export to the other customers will therefore be:

$$F_{H,OtherConsumers} = BM_H \cdot HAL_{ExportedToOtherConsumers} \cdot EF_{Exposed} = 62.3 \cdot 100 \cdot 1 = 6230 EUA$$

Example C
Example C considers the situation shown in the figure below:

Figure 8. Example C: heat delivered to private households through a district heating network, with multiple heat producers
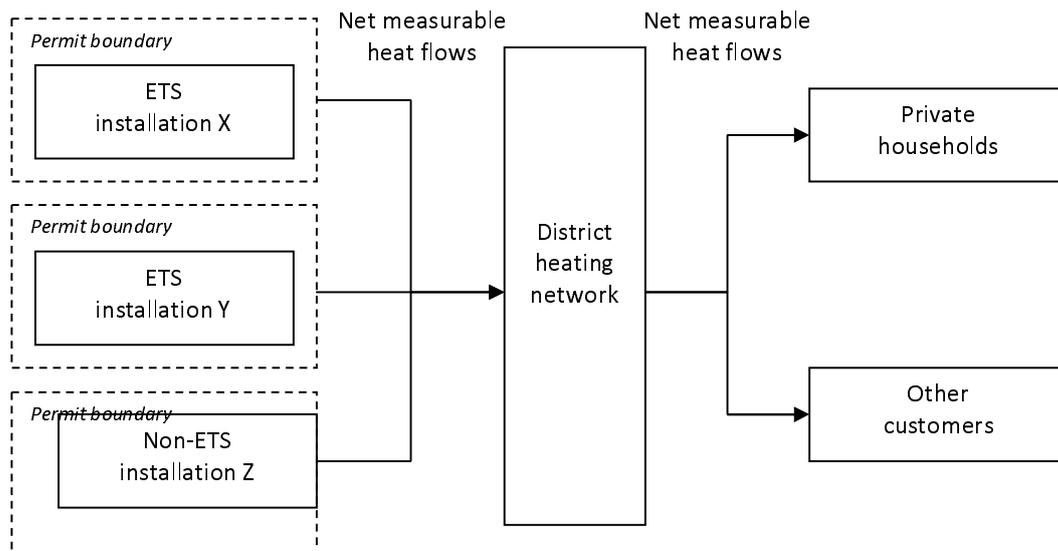
In example C, the rule on private households also applies to the ETS installations provided that evidence on the amount of heat delivered to private households can be provided (see first part of section 3.3). The share of heat delivered to private households on the total heat delivered applies to both ETS installations X and Y. The allocation for the heat delivered to the other customers (non-households) via the district heating network is based on the standard rule for heat export to non-ETS entities (allocation to heat producer, application of exposure factor for non-carbon leakage exposed sectors unless evidence on CL exposure can be provided).

In both examples B and C, no allocation will be given to the district heating network operator, which only acts as an intermediary between the ETS installations and the final customers. If the district heating network is an ETS plant (e.g. if it is also producing heat itself), it will receive allowances for heat consumed and/or for heat produced and exported (see also sections 3.2 and 3.5 on this topic).

3.4 Multiple heat exporters and one heat importer

This section considers the case in which an ETS heat installation imports heat from both an ETS installation and a non-ETS entity

Schematic
The figure below shows the situation discussed in this section.

Figure 9. An ETS heat installation imports heat from both an ETS installation and a non-ETS entity
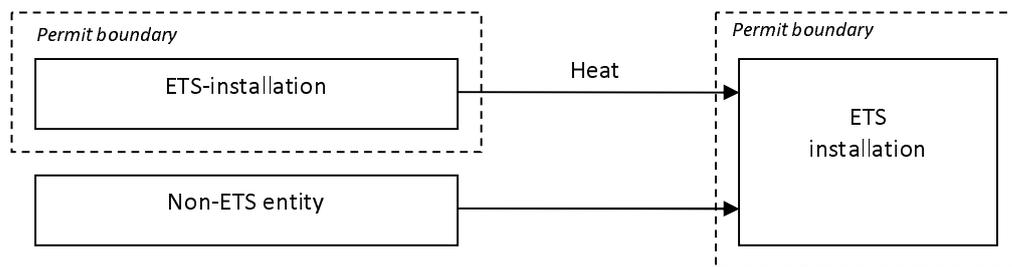
Preliminary allocation
Preliminary allocation is shown in Table 4 and is determined using the cases as discussed in sections 2 and 2.3 as building blocks:
- Heat import by an ETS sub-installation from an ETS installation were discussed in section 2.
- Heat import by an ETS sub-installation from a non-ETS entity were discussed in section 2.3.

Carbon leakage exposure factor
The carbon leakage exposure factor to be used is the exposure factor for the heat consuming sub-installation.

Table 11. Overview of preliminary allocation in case an ETS installation imports heat from both an ETS sub-installation and a non-ETS entity.

| Exporter/ importer	Preliminary allocation
ETS heat consumer	*The heat importing sub-installation is a product benchmark sub-installation* The allocation needs to be corrected for the amount of imported heat from the non-ETS installation. $$F_{P,preliminary} = (BM_P \cdot HAL_P - BM_H \cdot H_{import,non-ETS}) \cdot EF_C$$ *Allocation = (Product Benchmark x amount of Product produced – Heat Benchmark x Heat consumed) x Carbon leakage factor of heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne) BM_H: heat benchmark (expressed in EUA/TJ) H_{import}: the heat import from the non-ETS entities in the same base years as used for HAL_P (expressed in TJ/year) EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is not a product benchmark sub-installation The heat imported from ETS installations is taken into account in the historical activity level of the heat importing sub-installation. The heat imported from non-ETS entities is not eligible for free allocation: $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF_C$$ *Allocation = Heat Benchmark x Heat consumed (excl. heat from non-ETS entity) x Carbon leakage factor of heat consumer* where: $F_{H,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year), by definition this historical activity level does not consider the heat imported from non-ETS entities. EF_C: carbon leakage exposure factor of the heat consumer
ETS heat exporter	The part of the ETS installation that exports heat to other ETS installations does not receive any allowances for the heat export
Non-ETS exporter	Non-ETS entities can not receive free allocation

3.5 Multiple heat exporters and importers

This section considers the case in which multiple heat producers provide heat to a heat network that delivers heat to multiple consumers. Both producers and consumers consist of ETS installations and non-ETS entities.

Schematic
The figure below shows the situation discussed in this section. The heat network conforms to the definition of a heat distributor in section 3.2.

Figure 10. A heat network with ETS and non-ETS heat producers and heat consumers
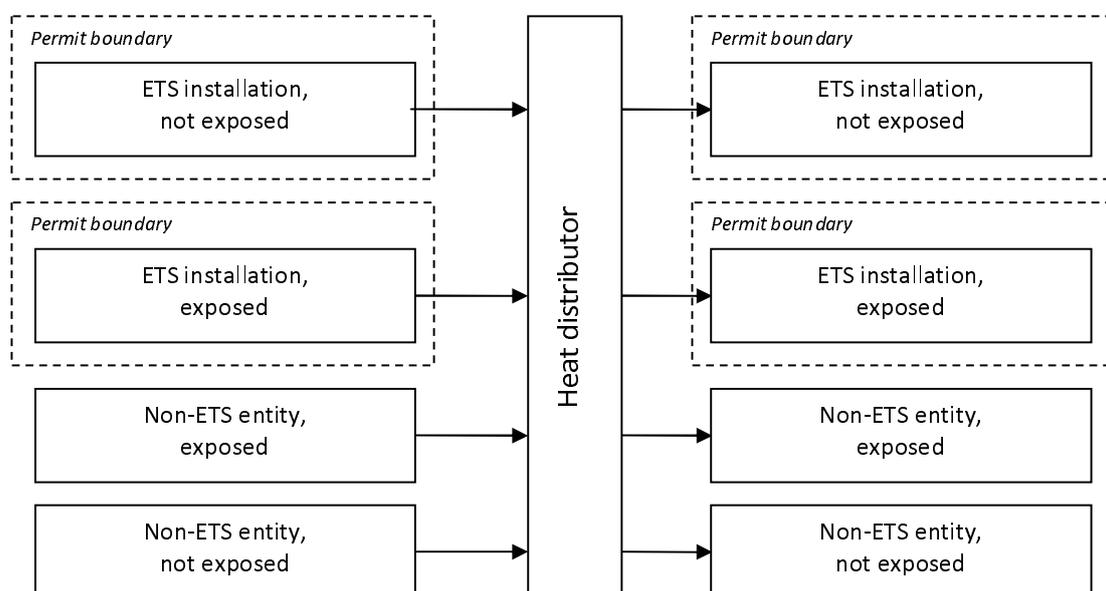
Preliminary allocation
Preliminary allocation is shown in Table 11 and is determined by regarding the heat network as non-ETS entity. The allocation in that table assumes that none of the non-ETS entities is a private household.

Carbon leakage exposure factor
The carbon leakage exposure factor to be used is the carbon leakage factor for non-carbon leakage exposed sectors unless evidence on the carbon leakage exposure of the heat consumer can be provided.
The share of heat delivered to carbon leakage exposed heat consumers on the total heat delivered applies to all ETS installations delivering the heat.

Such data can only be delivered by the heat distributor on a voluntary basis as there are no legal obligations for these entities in the context of the data collection. Following data are in principle needed and should be provided to the ETS installations concerned:

- Amount of heat to non-ETS-installations or entities (not private households, differentiated: CL-/non-CL exposed) and
- Amount of heat to private households.

Member States may ask for more information, if needed.

Table 12. Overview of preliminary allocation in case of multiple exporters and multiple importers.

Exporter/ importer	Preliminary allocation
ETS exporters	*The heat exporting sub-installation by definition is a heat benchmark sub-installation* The heat exported to the heat network (regarded as non-ETS entity) is taken into account in the historical activity level of the heat exporting sub-installation: $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF$$ *Allocation = Heat Benchmark x amount of net exported Heat x Carbon leakage factor* where: $F_{H,preliminary}$: annual preliminary allocation to the heat exporting sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the annual median historical heat produced and exported to non-ETS entities over the baseline period, unless used for electricity production. EF The carbon leakage exposure factor for non-carbon leakage exposed sectors, unless evidence on the carbon leakage exposure of the heat consumer can be provided
Non- ETS heat exporters	Non-ETS entities can not receive free allocation
ETS importers	*The heat importing sub-installation is a product benchmark sub-installation* The imported heat is not eligible for free allocation since it comes from a heat network that is regarded at non-ETS entity. The imported heat is however taken into account by the product benchmark. The allocation therefore needs to be corrected for the amount of imported heat. $$F_{P,preliminary} = (BM_P \cdot HAL_P - BM_H \cdot H_{import}) \cdot EF_C$$ *Allocation = (Product Benchmark x amount of Product produced* *− Heat Benchmark x Heat consumed) x Carbon leakage factor of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne) BM_H: heat benchmark (expressed in EUA/TJ) H_{import}: the heat import in the same base years as used for HAL_P (expressed in TJ/year) EF_C: carbon leakage exposure factor of the heat consumer

	The heat importing sub-installation is not a product benchmark sub-installation The heat imported from the heat network regarded as non ETS entity is not taken into account in the determination of the historical activity level. As a consequence, the heat benchmark sub-installation does not receive any allowances for the imported heat imported.
Non-ETS importers	Non-ETS entities can not receive free allocation

4 Significant changes in heat flows after 1 January 2005

This chapter describes the effect of significant capacity changes in case of heat benchmark sub-installations. The definition of significant capacity changes is given in article 3(i), (j) and (k) of the CIMs and is further explained in section 4.1 for the case of a heat benchmark sub-installation. The effect of significant capacity changes is described in section 4.2. Please also consult guidance document no. 2 which provides general information on capacity changes.

4.1 Definitions of capacity extensions/reductions

Significant capacity extension of heat benchmark sub-installation
A 'Significant capacity extension' of a heat benchmark sub-installation means either a significant increase in the capacity of consumption of heat eligible for free allocation or a significant increase in the capacity of heat export to non-ETS entities or a combination of both.

Significant capacity reduction of heat benchmark sub-installation
A 'Significant capacity reduction' of a heat benchmark sub-installation means either a significant decrease in the capacity of consumption of heat eligible for free allocation or a significant decrease in the capacity of heat export to non-ETS entities or a combination of both.

Significant increase in the capacity of heat consumption
A 'significant increase in the capacity of heat consumption' can only be a result of one or more identifiable physical changes relating to the technical configuration and functioning of the equipment consuming heat that is eligible for free allocation. This excludes mere replacements of an existing production line with the same throughput.

In order for an increase in heat consumption to be marked as significant, the physical changes need to have any of the following results:
- the sub-installation can consume at least 10% more measurable heat that is eligible for free allocation compared to the sub-installation before the change.
OR
- the sub-installation has a significantly higher consumption of measurable heat that is eligible for free allocation resulting in an additional allocation of emission allowances of more than 50000 allowances per year representing at least 5% of the preliminary annual number of emission allowances allocated free of charge for this sub-installation before the change.

Note that only changes in eligible heat are concerned. Hence significant capacity could result from physical changes as a result of which the consumption of heat that is not eligible for free allocation (i.e. from a non-ETS installation or nitric acid producing sub-installation) is replaced by consumption of heat that is eligible for free allocation (i.e. from an-ETS installation, excluding nitric acid producing sub-installations).

Significant decrease in the capacity of heat consumption
A 'significant capacity reduction' can only result from one or more identifiable physical changes as specified above under 'significant increase in the capacity of heat consumption'.

In order for a decrease in heat consumption to be marked as significant, the physical changes need to lead a significant decrease in a sub-installation's capability to consume measurable eligible heat and/or relating allocation of magnitudes considered to constitute a significant capacity reduction. In this context, physical changes exclusively aiming at improving the energy efficiency of a sub-installation should not be regarded as physical change leading to a significant capacity change or not considered as physical change.

Significant increase in the capacity of heat export to non-ETS entities
A 'significant increase in the capacity of heat export to non-ETS entities' results from one or more identifiable physical changes relating to the technical configuration and functioning of the equipment producing the heat. This excludes mere replacements of an existing boiler. The physical change has to take place within the boundaries of the sub-installation concerned.

In order for an increase in heat export to be marked as significant, the physical changes need to have any of the following results:
- the heat export to non-ETS entities can increase by 10% compared to the initial heat export before the change,
OR
- the increase in heat export to non-ETS entities leads to an additional allocation of emission allowances of more than 50000 allowances per year representing at least 5% of the preliminary annual number of emission allowances allocated free of charge for the heat exporting sub-installation before the increase in heat export.

Note that on eligible heat is concerned. Heat exported by equipment that is not covered by the EU-ETS or nitric acid producing sub-installations can never result in a significant change in heat export.

Significant decrease in the capacity of heat export to non-ETS entities
A 'significant decrease in the capacity of heat export to non-ETS entities' results from one or more identifiable physical changes to the technical configuration and functioning

of the equipment producing the heat leading to a significant decrease in heat export to non-ETS entities and/or relating allocation of the magnitude similar to a significant increase in heat export to non-ETS entities.

4.2 Allocation in case of significant capacity changes

Significant changes between 1 January 2005 and 30 June 2011 impact the historical activity level. These changes are discussed in Guidance Document 2.

Changes after 30 June 2011 are subject to new entrant/closure regulations and are discussed in Guidance Document 7.

In the context of significant capacity changes of heat benchmark sub-installations, two things are important to keep in mind:
-    Significant capacity changes can only be the result of a physical change. If an installation would change heat supplier without making a physical change, the change in heat supply would not be regarded as a significant changes in capacity.
-    The capacity is defined on the basis of consumption of heat produced by units covered by the ETS and export of heat produced by units covered by the ETS to non-ETS entities. Therefore switches to other heat suppliers or costumers can lead to a significant change in capacity even though the amount of heat consumption or export does not change.

Examples:
An ETS installation consumes heat produced by a boiler covered by the same permit. The installation makes a physical change due to which it can consume more heat. The additional heat is sourced from a biomass fueled CHP unit that is not part of the EU ETS. This case would not be regarded as a significant capacity change since the amount of consumed heat that is eligible for free allocation does not change. Hence, the increase in heat consumption does not lead to a change in capacity (*see Guidance Document 7 on new entrants and closures*).

An ETS installation exports heat to a non-ETS consumer. This consumers increase his production and heat consumption by 30%. The additional amoiun t of heat is delivered by the ETS installation using existing boiler spare capacities without any physical change at the supplier's side. Due to the absence of a physical change, this increased consumption cannot constitute a significant capacity increase of the heat exporting heat benchmark sub-installation.

5 Special allocation examples

5.1 Heat flows from a nitric acid benchmark sub-installation to another sub-installation

This section discusses the allocation in case of heat flows from an installation that produces products covered by the nitric acid benchmark and another sub-installation, (see Commission Decision, Article 10 (6))

Schematic
Figure 11 shows the situation discussed in this section.

Figure 11. Heat flows from a nitric acid benchmark sub-installation to another sub-installation
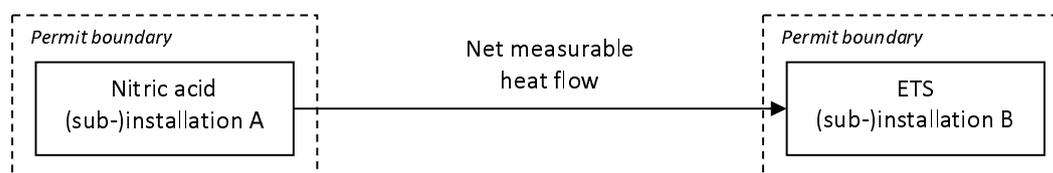
Preliminary allocation
As a general rule, the preliminary allocation for the nitric acid benchmark will be calculated based on the product benchmark for nitric acid and the historic activity level.

The preliminary allocation for the heat consuming (sub-)installation B will be adjusted for the emissions related to the production of the heat consumed.

An overview of the preliminary allocation is given Table 12.

Carbon leakage exposure factor
The carbon leakage exposure factor to be used in the determination of the allocation to (sub-)installation B is the exposure factor for the heat consuming sub-installation.

Table 13. Overview of preliminary allocation in case of a heat flow from a nitric acid installation to another ETS installation

Preliminary allocation to heat exporting nitric acid (sub-)installation A	Preliminary allocation to heat importing sub-installation B
Allocation is given to the nitric acid producer based on the nitric acid benchmark, but no additional allocation for the exported heat A (sub-)installation that exports heat to another (sub-)installation does never receive any allowances for the heat export	*The heat importing sub-installation is a product benchmark sub-installation* $$F_{P,preliminary} = \left(BM_P \cdot HAL_P - BM_H \cdot HAL_H \right) \cdot EF_C$$ *Allocation = Product Benchmark x amount of Product produced x Carbon leakage exposure factor of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUA/year) BM_P: product benchmark (expressed in EUA/tonne) HAL_P: the product-related related historical activity level (expressed in tonne/year) BM_H: heat benchmark (expressed in EUAs/TJ) HAL_H: the heat-related historical activity level (expressed in TJ/year); i.e., the median annual heat consumed over the baseline period. EF_C: carbon leakage exposure factor of the heat consumer
	The heat importing sub-installation is a heat benchmark sub-installation $$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF_C$$ *Allocation = Heat Benchmark x (Total heat consumed – Heat consumed from nitric acid installation) x Carbon leakage exposure factor of the heat consumer* where: $F_{H,preliminary}$: annual preliminary allocation to the heat importing sub-installation (expressed in EUAs/year) BM_H: heat benchmark (expressed in EUAs/TJ) $HAL_{H,total}$: the heat-related historical activity level (expressed in TJ/year); i.e., the median over the baseline of the annual heat consumed minus the heat imported from the nitric acid (sub-)installation EF_C: carbon leakage exposure factor of the heat consumer

5.2 Heat flows within an integrated paper mill

This section discusses the allocation in case of heat flows within an integrated paper mill. Usually, an integrated paper mill includes a pulp product benchmark sub-installation, a paper product benchmark sub-installation and a heat benchmark sub-installation. The allocation for pulp product benchmark sub-installations is ruled specifically in Commission Decision, Article 10 (7):

"Where an installation encompasses sub-installations producing 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) exporting measurable heat to other technically connected sub-installations, the preliminary total amount of emission allowances allocated free of charge shall, without prejudice to the preliminary annual numbers of emission allowances allocated free of charge for other sub-installations of the installation concerned, only take into account the preliminary annual number of emission allowances allocated free of charge to the extent that pulp products produced by this sub-installation are placed on the market and not processed into paper in the same or other technically connected installations."

The same specific rule applies to pulp producing sub-installations exporting heat to other technically connected sub-installations or installations.

Schematic
Figure 12 shows the situation discussed in this section.

Figure 12. Heat flows within an integrated paper mill
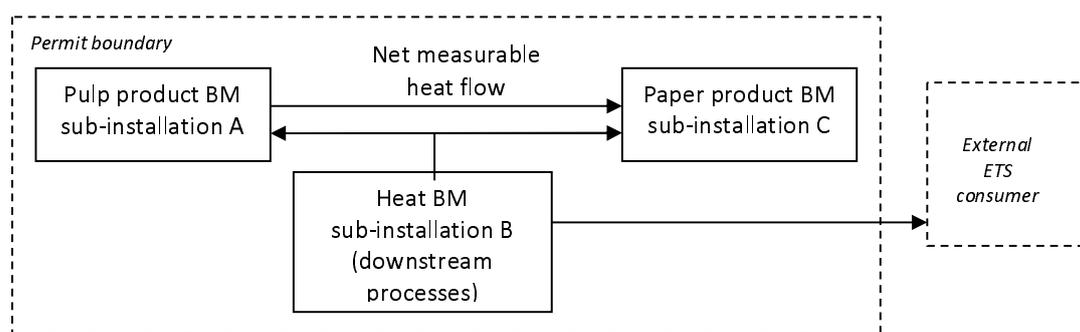
Preliminary allocation
As a general rule, the preliminary allocation for the integrated paper mill will be based on the sum of allocation for the two product benchmark sub-installations and the heat benchmark sub-installation. For the determination of the pulp product benchmark sub-installation, a special rule applies.

The preliminary allocation for the pulp product sub-installation A will be calculated based on the product benchmark for the pulp product and the historic activity level of <u>pulp produced and placed on the market and not processed into paper in sub-installation C</u>. It will not receive any additional allocation for consumed heat as this is included in the product benchmark.

The preliminary allocation for the paper product sub-installation C will be calculated based on the product benchmark for the paper product and the historic activity level of paper production. It will not receive any additional allocation for consumed heat as this is included in the product benchmark.

The heat benchmark sub-installation B will only receive allocation for the heat consumed at the installation outside the boundaries of the product benchmark sub-installations for pulp and paper and for the heat delivered to external non ETS consumers.

An overview of the preliminary allocation is given Table 13.

Carbon leakage exposure factor
For both product benchmark sub-installations and heat benchmark sub-installation (consumption of heat for downstream processes not covered by product benchmarks), the respective carbon leakage factors have to be applied.

Table 14. Overview of preliminary allocation in case of a heat flow from one ETS installation to another ETS installation

Preliminary allocation to pulp product sub-installation A	Preliminary allocation to paper product sub-installation C	Preliminary allocation to heat producing sub-installation B
Allocation is given to the pulp product sub-installation based on the respective pulp benchmark. and the production of pulp that is put on the market and not processed into paper in sub-installation C.	Allocation is given to the paper product sub-installation based on the respective paper benchmark.	*Heat is exported to an external ETS consumer* The sub-installation receives no allocation for heat exported to ETS consumers.

$$F_{P,preliminary} = BM_P \cdot HAL_{P,export} \cdot EF$$

Allocation = Product Benchmark x amount of Product produced x Carbon leakage exposure factor of pulp production

$$F_{P,preliminary} = BM_P \cdot HAL_P \cdot EF$$

Allocation = Product Benchmark x amount of Product produced x Carbon leakage exposure factor of paper production

Heat is consumed within the sub-installation
This sub-installation covers heat consumed at the installation outside the boundaries of the product benchmark sub-installations for pulp and paper.

$$F_{H,preliminary} = BM_H \cdot HAL_H \cdot EF_C$$

Allocation = Heat Benchmark x heat consumed outside boundaries of product benchmarks x Carbon leakage exposure factor of the heat consuming process

where:

$F_{P,preliminary}$:	annual preliminary allocation to the pulp producing sub-installation (expressed in EUA/year)
BM_P:	product benchmark (expressed in EUA/tonne)
$HAL_{P, export}$:	the historical activity level related to the production of <u>pulp that is placed on the market and not processed in sub-installation C</u> (expressed in tonne/year)
EF:	carbon leakage exposure factor of pulp production

The sub-installation does not receive any additional allowances for the production or consumption of heat.

where:

$F_{P,preliminary}$:	annual preliminary allocation to the paper producing sub-installation (expressed in EUA/year)
BM_P:	product benchmark (expressed in EUA/tonne)
HAL_P:	the product-related historical activity level (expressed in tonne/year)
EF:	carbon leakage exposure factor of the paper producer

The sub-installation does not receive any additional allowances for the production or consumption of heat.

where:

$F_{H,preliminary}$:	annual preliminary allocation to the heat importing sub-installation (expressed in EUAs/year)
BM_H:	heat benchmark (expressed in EUAs/TJ)
$HAL_{H,total}$:	the heat-related historical activity level (expressed in TJ/year); i.e., the median over the baseline of the annual heat consumption outside the boundaries of product benchmark
EF_C:	carbon leakage exposure factor of the heat consuming process.