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UKETS15 FAR - Cross-boundary heat flows

April 2025

Note

This document is intended to provide guidance for operators of installations. If there is any inconsistency between the guidance and legislation, the legislation prevails.

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1 Overview

This document provides guidance to operators of installations under the UK Emissions Trading Scheme (UK ETS) and explains the allocation of allowances for heat flows across an installation boundary where that heat is defined as measurable heat. The treatment of heat imports and exports to and from UK ETS installations, non-UK ETS installations and district heating networks are described. Heat flows between two sub-installations within the same installation are covered in 'UKETS11 FAR - Determining allocation at the installation level' which includes the treatment of cooling and heat recovery from another sub-installation (Section 3.2).

The relevant legislation in this area is:

- **The Greenhouse Gas Emissions Trading Scheme Order 2020 (The Order)** https://www.legislation.gov.uk/uksi/2020/1265/contents as amended from time to time
- **The Free Allocation Regulation (FAR)** (Commission Delegated Regulation (EU) 2019/331 of 19 December 2018) as it has effect in domestic law and as amended by the Order
- **The Monitoring and Reporting Regulation (MRR)** (Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018) on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council (disregarding any amendments adopted after 11 November 2020) as given effect for the purpose of the UK ETS by article 24 of the Order, subject to the modifications made for that purpose from time to time
- **The Verification Regulation (VR)** (Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the verification of data and on the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council (disregarding any amendments adopted after 11 November 2020), as given effect for the purpose of the UK ETS by article 25 of the Order, subject to the modifications made for that purpose from time to time

2 Principles for the treatment of cross-boundary heat flows

2.1 Net heat flows

Only net measurable heat flows are relevant for allocation purposes[1]. See below for an explanation of what is meant by 'net'.

Measurable heat flows have all the following characteristics:

- They are **net,** meaning that the heat content in the condensate or transfer medium returning[2] to the heat supplier is subtracted. For determination of net measurable heat data see section E.II in 'UKETS12 FAR - Guidance on completing the 2025 Baseline Data Collection' and section 4.9 in 'UKETS13 FAR - Monitoring and reporting in relation to the free allocation rules'.
- 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**[3] (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, net measurable heat can be eligible for free allocation[4] under certain conditions, depending on the producer and consumer. The number of free allowances depends on the historical activity levels (HAL) of the heat benchmark and district heating sub-installations[5], as described in section 3.

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[1] Article 2(7) of the FAR: "*'measurable heat' means a net heat flow transported through identifiable pipelines or ducts using a heat transfer medium, such as, steam, hot air, water, oil, liquid metals and salts, for which a heat meter is or could be installed*."
[2] In case the condensate is not returned or its flow unknown, a reference temperature of 90°C should be used, as explained in section 4.9 of 'UKETS13 FAR - Monitoring and reporting in relation to the free allocation rules'
[3] Article 2(8) of the FAR: "*'heat meter' means a thermal energy meter (MI-004) or any other device to measure and record the amount of thermal energy produced based upon flow volumes and temperatures*". For guidance on measuring thermal energy flow with heat meters and alternative options see section 4 of 'UKETS13 FAR - Monitoring and reporting in relation to the free allocation rules'
[4] See also 'UKETS11 FAR - Determining allocation at the installation level'
[5] Article 15(4) of the FAR states:
"*The heat-related historical activity level shall refer to the arithmetic mean of annual historical import from an installation covered by the EU ETS or UK ETS, production, or both, during the baseline period, of net measurable*

The basic principles of eligibility for cross-boundary heat flows are that:

- the heat needs to be produced by a UK ETS installation,

  AND
- only a UK ETS installation can receive free allocation.

Therefore, the types of heat for which a UK ETS installation can receive free allocation can be summarised follows:

A UK ETS installation will receive free allocation for the net measurable heat

- ***produced** within the same installation*

  AND/OR
- *i**mported** from another UK ETS installation*

AND

- ***consumed** within the installation boundaries, outside the boundaries of any product benchmark,*

  AND/OR
- ***exported** for district heating purposes,*

  AND/OR
- ***exported** to non-UK ETS entities other than for district heating purposes.*

UNLESS

- it is used to produce electricity
- it is used to produce mechanical energy that is used to produce electricity
- it is net measurable heat recovered from nitric acid production.

In case of multiple flows of eligible heat, the annual activity level of a heat benchmark sub-installation is the sum of the eligible net measurable heat flows.

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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 an installation or other entity not covered by the EU ETS or UK ETS with the exception of the export for the production of electricity expressed as terajoule per year.

The district heating-related historical activity level shall refer to the arithmetic mean of annual historical import from an installation covered by the EU ETS or UK ETS, production, or both, during the baseline period, of measurable heat which is exported for the purposes of district heating expressed as terajoule per year."

2.2 No distinction between different origins of heat

No distinction is made between net measurable heat from different sources, if it can be regarded as covered by the UK ETS and it is not produced from electricity. In principle, net measurable heat is eligible for free allocation if it can be regarded as covered by the UK ETS and if it is not produced via electric boilers. This is likely to be the case for net 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 UK ETS.

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 accounted for in the nitric acid benchmark (see Article 16(5) of the FAR)
- The consumption of heat produced by a non-UK ETS installation or other entity (not covered by a greenhouse gas emissions (GHGE) permit) is not eligible for free allocation (see Articles 15(4) and 21 of the FAR)
- The export or consumption of heat used for electricity generation is not eligible for free allocation (see Articles 2(3a) and 15(4) of the FAR)

Some examples of net measurable heat flows are given below, together with their eligibility for allocation:

Example 1: A UK ETS installation that produces paper consumes steam from a 40MWe CHP unit that is covered by the same GHGE permit. In this case, the heat flow is not regarded as cross-boundary. The net measurable heat consumed by the installation is eligible for free allocation either under a product benchmark sub-installation (if any) or a heat benchmark sub-installation.

Example 2: A UK ETS installation that produces paper consumes net measurable heat from an external 5 MW boiler that is not covered by a GHGE permit. In this case, the heat delivered to the UK ETS installation is not eligible for allocation. If consumed within a product benchmark sub-installation, it must be considered as “heat import from non-UK ETS” in the heat balance (section E.II of the baseline data and activity level reports) and within the sub-installation.

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

Example 4: Within a UK ETS installation, net measurable heat from a nitric acid production process is used in fertiliser production that is covered by the same GHGE permit. The heat delivered from the nitric acid sub-installation is not eligible for free allocation.

Example 5: A plant producing carbon black recovers net measurable heat from the exothermic production process and delivers it within the same installation to a district heating network. In

this case, the installation receives free allocation for the carbon black it produces via a product benchmark sub-installation. The recovered heat is eligible for free allocation and the plant receives additional free allocation via a district heating sub-installation (if not all the recovered heat is exported to the district heating network, then the remainder may be eligible for allocation under a heat benchmark sub-installation).

2.3 District heating

Where net measurable heat is exported for district heating purposes, it is not allocated under the heat benchmark (as per phase 3 of the EU ETS), but rather the dedicated district heating (DH) benchmark which has its own sub-installation. The term “district heating purpose” is to distinguish ‘measurable heat exported for the purpose of district heating’ from other exported heat eligible for free allocation and from non-eligible exported heat (for other purposes, such as for electricity production). *For more terminology related to district heating, see the box below.*

Article 2(4) of the FAR gives the following definition of district heating:

> *“‘district heating’ means the distribution of measurable heat for the purpose of heating or cooling of space or of production of domestic hot water, through a network, to buildings or sites not covered by UK ETS with the exception of measurable heat used for the production of products and related activities or the production of electricity.”*

A district heating sub-installation is so defined if both of the following apply:

- The installation produces measurable heat outside the boundaries of a nitric acid product benchmark sub-installation

  OR

- The installation imports measurable heat from a UK ETS installation, provided that the heat is not produced within the boundaries of a nitric acid product benchmark

  AND

- The heat is exported for the purpose of district heating.

District heating is characterised as follows:

- It concerns the distribution of **measurable heat** through a network
- For the purposes of **heating or cooling of space** or to produce **domestic hot water**
- To buildings or sites **not covered by the UK ETS**
- Excluding measurable heat used to produce products and related activities or generate electricity.

Where a UK ETS installation produces heat used for district heating and transfers heat produced by others for district heating, the operator must split the heat sent for district heating between the heat it produced and the heat produced by another installation to calculate its allocation (see section 4.2).

No distinction need be made on the carbon leakage status of a district heating sub-installation, as all heat used for the purpose of district heating is, by definition, not exposed to a risk of carbon leakage. Therefore, a maximum of one DH sub-installation can be defined. To reward the efficient use of excess heat for district heating purposes, district heating sub-installations are not subject to the same decrease in carbon leakage exposure factor (CLEF) in the calculation of the number of free allowances as other non-carbon leakage sub-installations are. Instead, a CLEF of 0.3 continues to be applied for district heating sub-installations after 2025.[6]

District heating concepts

District heating is referred to in different ways in relation to the UK ETS and its free allocation rules. A distinction can be made between:

- District heating as an **activity**, defined in Article 2(4) of the FAR as:

  "the distribution of measurable heat for the purpose of heating or cooling of space or of production of domestic hot water, through a network, to buildings or sites not covered by UK ETS with the exception of measurable heat used for the production of products and related activities or the production of electricity"

- A district heating **installation**, i.e. the installation producing heat for district heating, which can be a UK ETS installation or a non-UK ETS installation, depending on the type and capacity of the installation used
- A district heating **distributor**, distributing the heat through a district heating network, which can either be produced by the distributor itself or purchased from third parties
- A district heating **network**, the grid of pipelines and equipment used to distribute the heat for the purpose of district heating
- A district heating **sub-installation**, a sub-installation defined in a UK ETS installation for the purpose of determining the allocation to the installation related to measurable heat exported for the purpose of district heating, as defined in Article 2(5) of the FAR
- District heating purpose, to distinguish exported heat eligible for free allocation ('measurable heat exported for the purpose of district heating') from non-eligible exported heat (for other purposes, such as for electricity production).

2.4 List of technical connections

Connections for the import or export of heat, CO2, or waste gas across the installation boundary are called technical connections. Each operator should clearly list all its technical connections in the baseline data and activity level reports. All connected installations and

[6] Subject to the outcome of the Free Allocation Review

entities must be identified and notified to the regulator, as well as changes in connections. See ‘UKETS12 FAR - Guidance on completing the 2025 Baseline Data Collection’ for further guidance on data reporting.

Heat flow is a common type of technical connection. Heat flows between sub-installations within the same installation are not considered technical connections except when it is related to a nitric acid sub-installation. All technical connections need to be listed, including heat flows that are not eligible for free allocation. All data related to cross-boundary heat flows, including export or import of heat to non-UK ETS entities, are subject to independent verification.

3 Heat flows between one heat exporter and one heat importer

This section explains the preliminary allocation calculation methodology related to direct cross-boundary net measurable heat flows. For guidance on the calculation of the final allocation and how the allocation calculation differs for situations such as new entrants, installations operating less than two years in the baseline period or activity level changes, please refer to 'UKETS11 FAR - Determining allocation at the installation level'.

3.1 Heat flows between two UK ETS installations

This section discusses the allocation when heat flows from one installation to another installation and when both installations are in the UK ETS.

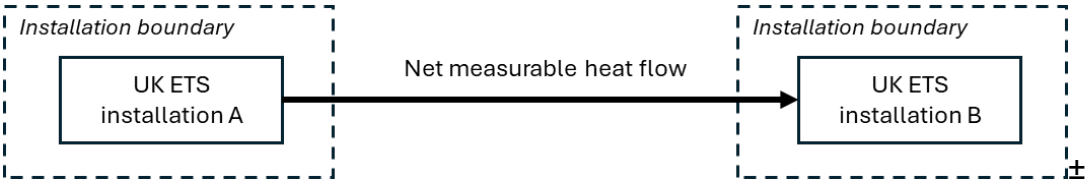

Figure 1 Schematic showing heat flows from a UK ETS installation to another UK ETS installation

Preliminary allocation

Generally, the free allocation is given to the installation that consumes the net measurable heat. An overview of the preliminary allocation is given in Table 1.

Carbon leakage exposure factor (CLEF)

The carbon leakage exposure factor must correspond to the CLEF applicable to the heat consumer, i.e. the consuming sub-installation(s) of the importing UK ETS installation.

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

<table>
<tr><th>Preliminary allocation to heat-exporting installation A</th><th>Preliminary allocation to heat-importing installation B</th></tr>
<tr><td rowspan="2">No allocation is given to the heat producer when exporting to a UK ETS Installation

The part of UK ETS installation A’s heat that is exported to other UK ETS installations does not receive any allowances</td><td>Where the heat is imported to be used within the perimeter of a product benchmark sub-installation

The imported net measurable heat is accounted for in the product benchmark[7].

$$F_{P,preliminary} = BM_P \times HAL_P \times CLEF_P$$

Allocation = product benchmark x amount of product produced x CLEF of the heat consumer

where:

$F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances /year)

BM_P: product benchmark (expressed in allowances/tonne)

HAL_P: product-related HAL (expressed in tonnes/year)

$CLEF_p$: carbon leakage exposure factor of the product benchmark</td></tr>
<tr><td>Where the net measurable heat is imported for use outside the perimeter of a product benchmark sub-installation:

The heat imported from UK ETS installations is accounted for in the HAL of the importing heat sub-installation:</td></tr>
</table>

[7] Allocation for all net measurable heat, including imported heat, used to produce a product covered by a product benchmark is included in the allocation to the product benchmark, and therefore does not receive any additional allocation under a different sub-installation. See guidance ‘UKETS11 FAR - Determining allocation at the installation level’ for further explanation on how product benchmarks are defined.

	$$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x heat consumed x CLEF of the heat consumer* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_H: heat-related HAL (expressed in TJ/year); i.e. the arithmetic mean of annual net measurable heat consumed over the baseline period. $CLEF_H$: carbon leakage exposure factor of the consumer's heat sub-installation

3.2 Heat flow from a UK ETS installation to a non-UK ETS installation or entity

This section discusses allocation in the case net measurable heat flows from a UK ETS installation to an installation or entity that is not covered by the UK ETS. Whether the heat exported to the non-UK ETS heat consumer is used for the purpose of district heating[8] or not can have an impact on allocation. Both options are described below.

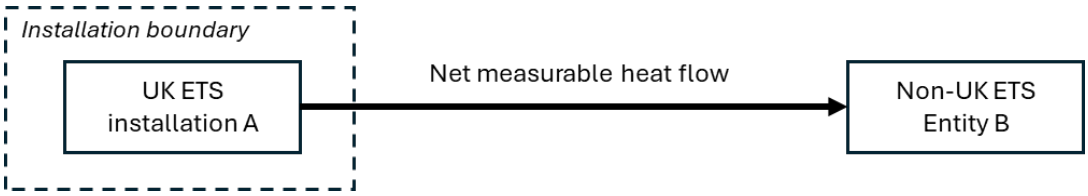

Figure 2 Schematic showing heat flows from a UK ETS installation to a non-UK ETS entity

Preliminary allocation

In this scenario the net measurable heat is consumed outside of the UK ETS, so the free allowances are given to the heat producer for the net measurable heat exported. If the heat is exported for district heating purposes, the net measurable heat is eligible under the DH sub-installation of UK ETS installation A, otherwise the installation is entitled to allocation under a heat benchmark sub-installation. An overview of the preliminary allocation is given in Table 2.

Carbon leakage exposure factor

The non-UK ETS entities are by default deemed not to be exposed to a significant risk of carbon leakage, and the DH sub-installation is, by definition, similarly not exposed. The CLEF for sectors exposed to significant risk of carbon leakage can only be used if the heat exporter provides satisfactory evidence that it exports net measurable heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage: the operator will for example provide a verified list of customers consuming the heat, along with the NACE/PRODCOM codes of each customer and the amount of net measurable heat delivered to them. In the absence of such evidence, the CLEF for sectors not exposed to significant risk of carbon leakage must be used. Note that the CLEF for the district heating sub-installation has been fixed at 0.3 for the entirety of the trading period (2021 – 2030), as per Article 16(3) of the FAR.

If the heat exported to the non-UK ETS entity is used for production of products both exposed and non-exposed to a significant risk of carbon leakage (CL) then two sub-installations are needed, one CL and one non-CL heat benchmark sub-installation. Section 4.1 considers this

[8] 'District heating' means the distribution of measurable heat for the purpose of heating or cooling of space or of production of domestic hot water, through a network, to buildings or sites not covered by UK ETS except for measurable heat used to produce products and related activities or electricity. (Article 2(4) of the FAR)

situation in more detail. See also ‘UKETS13 FAR - Monitoring and reporting in relation to the free allocation rules’ on splitting heat between sub-installations.

Where at least 95% of the heat activity level is attributable to one of the three possible heat benchmark sub-installations (DH sub-installation, CL, or non-CL heat benchmark sub-installations), then the operator may attribute the total heat activity level to the sub-installation to which 95% or more of the heat applies (Article 10(3) of the FAR).

Table 2 Overview of preliminary allocation when heat flows from a UK ETS installation to a non-UK ETS entity

Preliminary allocation to heat-importing non-UK ETS entity B	**Preliminary allocation to heat-exporting installation A**
Non-UK ETS entities cannot receive free allocation	***Where non-UK ETS entity B has (wholly or partially) an activity other than district heating:*** *The sub-installation exporting heat to a non-UK ETS entity for purposes other than district heating is by definition a heat benchmark sub-installation.* The heat exported to non-UK ETS entities is accounted for within the HAL of the heat exporting sub-installation. $$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x amount of net exported heat x CLEF* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_H: heat-related HAL (expressed in TJ/year); i.e., the arithmetic mean of historical net measurable heat produced and exported to non-UK ETS entities over the baseline period, unless used for electricity production $CLEF_H$: The carbon leakage exposure factor for non-carbon leakage exposed sectors is used, unless the heat exporter provides evidence that it exports heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage.
	Where non-UK ETS entity B is (wholly or partially) a district heating network: *The district heat exporting sub-installation of installation A is a district heating sub-installation.*

	The heat exported for district heating is accounted for within the HAL of the district heating sub-installation. $$F_{DH,preliminary} = BM_H \times HAL_{DH} \times CLEF_{DH}$$ *Allocation = heat benchmark x amount of net exported heat x CLEF* where: $F_{DH,preliminary}$: annual preliminary allocation to the district heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_{DH}: district heating-related HAL (expressed in TJ/year); i.e., the arithmetic mean of annual net measurable heat produced and exported for district heating over the baseline period $CLEF_{DH}$: carbon leakage exposure factor district heating

3.3 Heat flows from a non-UK ETS installation or entity to a UK ETS installation

This type of heat flow occurs when a heat-importing UK ETS installation receives heat from a heat exporter that is outside of the UK ETS. For example:

- An installation excluded from the UK ETS that is exclusively using biomass and selling the heat produced to a UK ETS installation
- An installation for the incineration of municipal waste selling the heat produced to a ceramics plant
- A 5MW CHP selling the heat produced to a mineral wool plant.

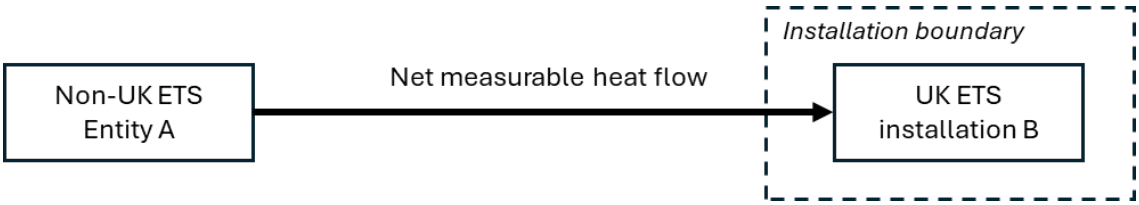

Figure 3 Schematic showing heat flows from a non-UK ETS entity to a UK ETS installation

Preliminary allocation

The consumption of heat produced outside of the UK ETS is not eligible for free allocation. An overview of the preliminary allocation is given in Table 3.

Carbon leakage exposure factor

The CLEF to be used is the CLEF for the heat consuming sub-installation.

Table 3 Overview of preliminary allocation where heat flows from a non-UK ETS entity to a UK ETS installation

Preliminary allocation to non-UK ETS heat producer A	**Preliminary allocation to heat-importing installation B**
Non-UK ETS entities cannot receive free allocation	***Where the imported heat is used <u>within</u> the perimeter of a product benchmark sub-installation:*** *The imported heat is not eligible for free allocation. The imported heat is accounted for in the product benchmark.*[78] *The allocation therefore needs to be corrected for the amount of imported heat.* $$F_{P,preliminary} = \left(BM_P \times HAL_P - BM_H \times H_{import}\right) \times CLEF_P$$ *Allocation = (product benchmark x amount of product produced – heat benchmark x non-UK ETS heat imported) x CLEF of the heat consuming sub-installation* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year). BM_P: product benchmark (expressed in allowances/tonne) HAL_P: product-related HAL (expressed in tonnes/year) BM_H: heat benchmark (expressed in allowances/TJ) H_{import}: heat import in the same baseline years as used for HAL_P (expressed in TJ/year) $CLEF_P$: carbon leakage exposure factor of the heat-consuming sub-installation

	Where the imported heat is to be used outside the perimeter of a product benchmark sub-installation: The heat imported from non-UK ETS entities is not considered when determining the HAL. Consequently, the heat benchmark sub-installation does not receive any allowances for the heat imported from non-UK ETS entities.

4 Heat flows involving multiple heat exporters and importers

This section discusses situations in which more than one heat exporter or importer is involved.

4.1 One heat exporter and multiple heat importers

This section considers the case in which one UK ETS installation exports heat to both UK ETS installations and non-UK ETS entities with different CLEFs.

Figure 4 shows the scenario discussed in this section, where the heat produced by the heat-exporting installation needs to be divided into different sub-installations ('UKETS11 FAR - Determining allocation at the installation level')

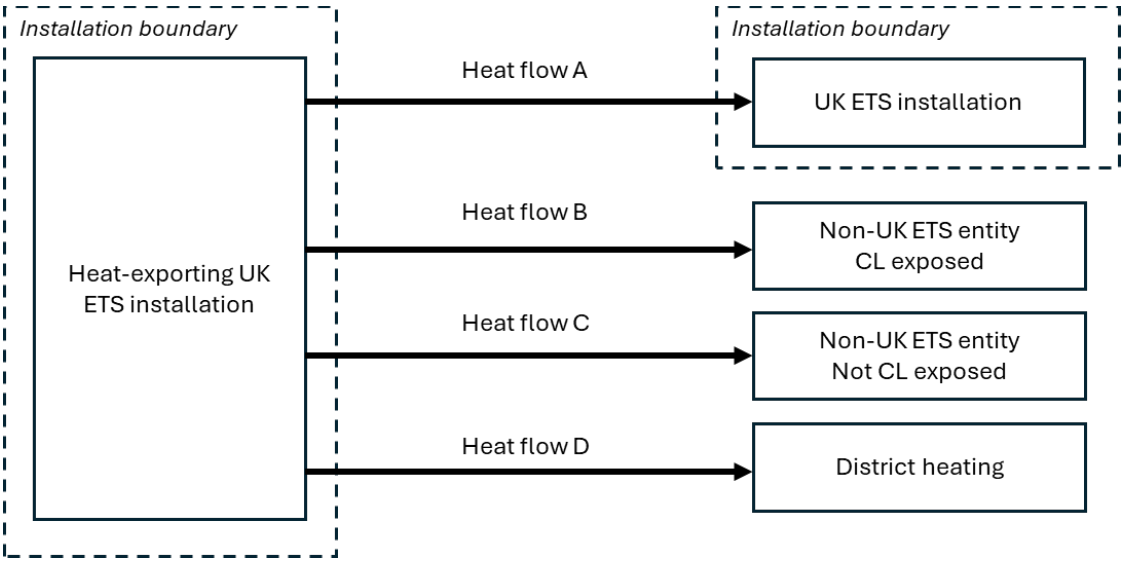

Figure 4 Schematic showing a UK ETS installation exporting heat to both UK ETS installations and non-UK ETS entities

Preliminary allocation

The preliminary allocation calculation is shown in Table 4, determined by using the scenarios discussed in sections 3.1 and 3.2:

- Heat export by a UK ETS installation to another UK ETS installation (heat flow A) is discussed in section 3.1. The allocation here goes to the heat importer; as the exporting UK ETS installation does not receive any allocation for the exported heat, it therefore does not need an additional sub-installation for the exported heat.

- Heat flows to non-UK ETS entities can be of 3 types, as discussed in section 3.2. These 3 types each have a different CLEF, depending on whether the non-UK ETS consumer uses the heat for district heating purposes (heat flow D), to produce products exposed to carbon leakage (heat flow B) or not exposed to carbon leakage (heat flow C). For all 3 types of heat flow the allocation goes to the exporter, with each type of heat flow requiring a different type of sub-installation.

Carbon leakage exposure factor

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

The non-UK ETS entities are by default deemed not to be exposed to significant risk of carbon leakage, while the district heating sub-installation is, by definition, not exposed to carbon leakage. The CLEF for carbon leakage exposed sectors can only be used if the heat exporter provides satisfactory evidence that it exports heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage: the operator will for example provide a list of customers consuming the heat, along with the NACE/PRODCOM codes related to each customer and the amounts of heat delivered to them. In absence of such evidence the CLEF for sectors not exposed to carbon leakage must be used. Note that the CLEF for the district heating sub-installation is fixed at 0.3 for the entirety of the trading period (2021 – 2030), as per Article 16(3) of the FAR. See also ‘UKETS11 FAR - Determining allocation at the installation level’ for guidance on splitting heat between different sub-installations.

Table 4 Overview of preliminary allocation where a UK ETS installation exports heat to both UK ETS sub-installations and non-UK ETS consumers with different CLEFs

Heat flow	Preliminary allocation
Heat flow from a UK ETS installation to another UK ETS installation: **Allocation goes to the UK ETS heat importer** Heat flow A	*The part of the UK ETS installation that **exports** heat to other UK ETS installations does not receive allowances for the heat produced and exported*
	*Where the heat is **imported** to be used **within** the perimeter of **a product benchmark sub-installation**:* The imported heat is accounted for in the product benchmark. [8] $$F_{P,preliminary} = BM_P \times HAL_P \times CLEF_P$$ *Allocation = Product Benchmark x amount of Product produced x CLEF of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/yea BM_P: product benchmark (expressed in allowances/tonne) HAL_P: product-related HAL (expressed in tonnes/year) $CLEF_p$: carbon leakage exposure factor of the product benchmark
	*Where the heat is **imported is** to be used **outside** the perimeter of **a product benchmark sub-installation*** The heat imported from UK ETS installations is accounted for in the HAL of the importing heat sub-installation: $$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x heat consumed x CLEF of the heat consumer*

<table>
<tr><td></td><td>where:

$F_{H,preliminary}$: annual preliminary allocation to the heat-exporting sub-installation (expressed in allowances/year)

BM_H: heat benchmark (expressed in allowances/TJ)

HAL_H: heat-related HAL (expressed in TJ/year); i.e., the arithmetic mean of historical net measurable heat produced and exported to non-UK ETS entities over the baseline period, unless used for electricity production or district heating

$CLEF_H$: carbon leakage exposure factor for non-carbon leakage exposed sectors is used (Heat flow C), unless the heat exporter provides evidence that it exports heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage (Heat flow B).</td></tr>
<tr><td>Heat flow from a UK ETS installation to a non-UK ETS entity other than district heating:
Allocation goes to the UK ETS heat exporter
Heat flows B and C</td><td>Where heat is exported to a non-UK ETS entity other than for district heating, the heat-exporting sub-installation is a heat benchmark sub-installation by definition:

The heat exported to non-UK ETS entities is accounted for in the HAL of the heat-exporting sub-installation:

$$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$

Allocation = heat benchmark x net heat exported x CLEF

where:

$F_{H,preliminary}$: annual preliminary allocation to the heat-exporting sub-installation (expressed in allowances/year)

BM_H: heat benchmark (expressed in allowances/TJ)

HAL_H: heat-related HAL (expressed in TJ/year); i.e., the arithmetic mean of historical net measurable heat produced and exported to non-UK ETS entities over the baseline period, unless used for electricity production or district heating</td></tr>
</table>

<table>
<tr><td rowspan="2"></td><td>$CLEF_H$: carbon leakage exposure factor for non-carbon leakage exposed sectors is used (Heat flow C), unless the heat exporter provides evidence that it exports heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage (Heat flow B).</td></tr>
<tr><td>Non-UK ETS entities cannot receive free allocation</td></tr>
<tr><td rowspan="2">Heat flow from a UK ETS installation for the purpose of district heating:
Allocation goes to the UK ETS heat exporter
<u>Heat flow D</u></td><td>Where heat is exported for district heating, the exporting UK ETS installation receives allocation under a district heating sub-installation:

The heat exported to district heating is accounted for within the HAL of the district heating sub-installation.

$$F_{DH,preliminary} = BM_H \times HAL_{DH} \times CLEF_{DH}$$

Allocation = heat benchmark x amount of net exported heat x CLEF

where:

$F_{DH,preliminary}$: annual preliminary allocation to the district heat-exporting sub-installation (expressed in allowances/year)

BM_H: heat benchmark (expressed in allowances/TJ)

HAL_{DH}: district heating-related HAL (expressed in TJ/year); i.e., the arithmetic mean of annual net measurable heat produced and exported for district heating

$CLEF_{DH}$: carbon leakage exposure factor district heating</td></tr>
<tr><td>Non-UK ETS entities cannot receive free allocation</td></tr>
</table>

4.2 Heat flows from a UK ETS heat exporter via a heat distributor

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

Definition of a heat distributor

A heat distributor is an entity which acts as an intermediary between the heat producers and the heat consumers. This means that in contrast to the situation described in section 4.1:

- The heat distributor is neither producing nor consuming the heat, and
- There is no direct contractual relationship between the heat producer and the heat consumers concerning the delivery of heat.

Where a direct heat delivery contract between heat producers and consumers does exist, but the heat physically passes through an intermediary heat distributor, the rules described in this section do not apply. In this scenario, the intermediate party is not considered as a separate entity, but rather as part of the heat transfer infrastructure. The standard rules for heat flows apply - with the allocation going to UK ETS heat consumers unless the heat is imported from non-UK ETS heat producers, whereas the allocation goes to UK ETS heat producers if consumers are not covered by the UK ETS (see Section 3).

In certain scenarios, an installation can be both a heat producer covered by the UK ETS and a heat distributor that transfers heat that it didn't produce between other installations or entities. Here the installation will be split virtually into two parts: the UK ETS heat production part A transfers the produced heat to the non-UK ETS heat distributor part B. Even though in this case parts A and B are within the same installation, the allocation for the heat is analogous to when the parts aren't in the same installation: the allocation goes to UK ETS heat producer A (as the heat is regarded as delivered to a non-UK ETS entity B, see Section 3.2). Both parts A and B can import heat from another UK ETS installation X, as shown in Figure 5. Should part A import heat (not shown in Figure 5) then it gets the same allocation as if it produced the net measurable heat itself. Where part B imports the heat, i.e. if installation X uses the part B heat transfer system without consumption by or transfer via part A, then installation X receives the allocation for exporting to non-UK ETS entities.

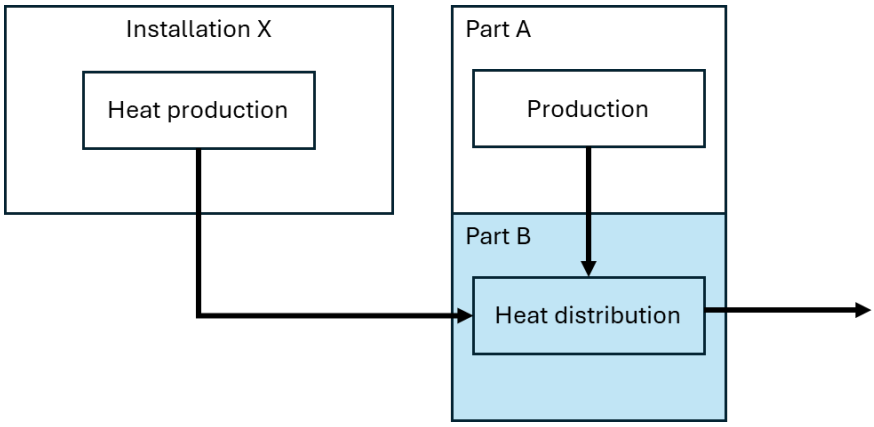

Figure 5 Example of a virtual split of a UK ETS installation that is also a heat distributor

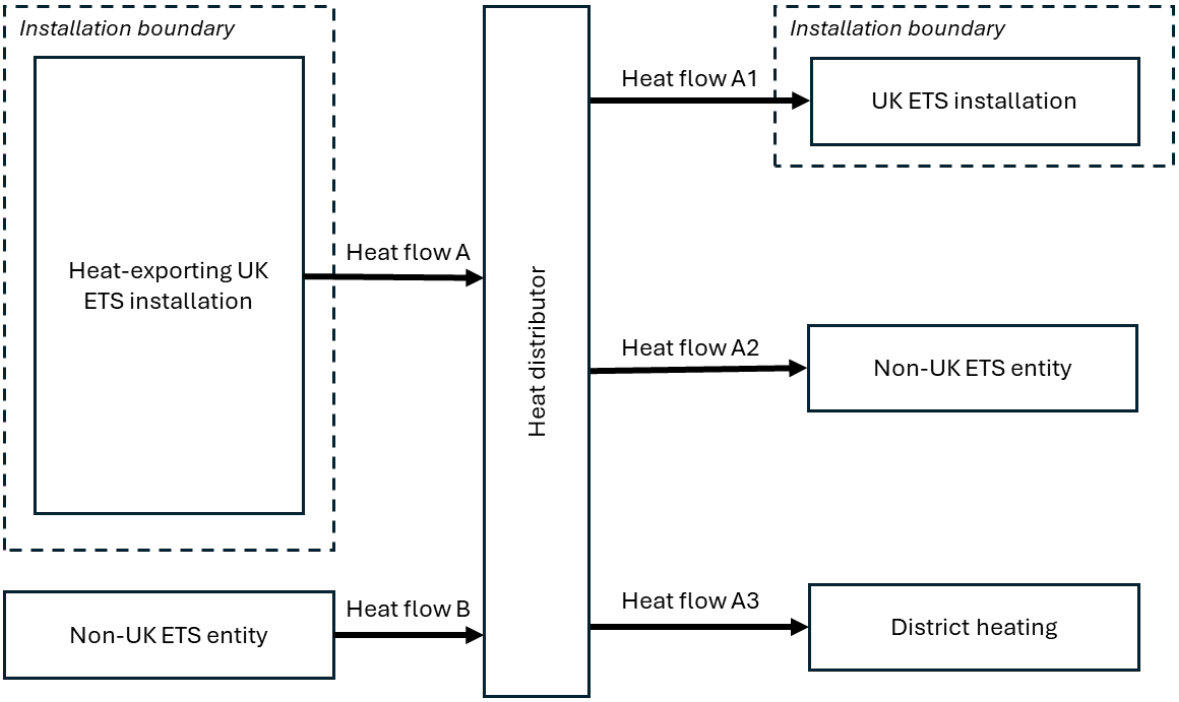

Figure 6 Schematic showing heat flows from a UK ETS installation via a non-UK ETS distributor[9]

Preliminary allocation

For the purposes of allocation, the heat distributor is regarded as a non-UK ETS entity, regardless of whether the installations to which it exports heat are within the UK ETS or not. Consequently, as a general rule:

- Heat producers covered by UK ETS that supply the heat distributor receive free allowances for the heat exported to the heat distributor (as it is non-UK ETS)

[9] The sum of A1 + A2 + A3 may be less than A due to heat loss which is eligible for free allocation.

- Heat consumers that are supplied by the heat distributor don’t receive free allowances, because the heat is supplied by a non-UK ETS entity.

Table 5 provides an overview of the preliminary allocation and includes some exceptions to the general rule above. The rules for heat transfer via a heat distributor also apply in complex heat networks linking multiple producers and consumers.

Carbon leakage exposure factor

The CLEF for non-carbon leakage exposed sectors must be used unless evidence can be provided that the heat consumer is exposed to carbon leakage, or evidence that the heat is being consumed for district heating.

These data can only be provided by the heat distributor (to the UK ETS heat exporter) on a voluntary basis, as there are no legal obligations on such entities within the context of data collection.

The UK ETS heat-exporting installation will for example need to provide a list of the customers that consume the heat, along with the NACE/PRODCOM codes of these customers and the amounts of heat delivered to them. In absence of such evidence the CLEF for sectors not exposed to carbon leakage is to be used.

Table 5 Overview of preliminary allocation when a UK ETS installation exports heat via a non-UK ETS heat distributor to heat importers

Heat flow	Preliminary allocation
UK ETS installation exporting heat to heat distributor (Heat flow A)	*The heat exporting sub-installation by default is a heat benchmark sub-installation. The default CLEF is for non-carbon leakage exposed sectors:* In the default case, the heat exported by the UK ETS heat-exporter to the heat distributor (a non-UK ETS entity) is accounted for in the HAL of the heat exporting sub-installation: $$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x amount of net exported heat x CLEF* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_H: net measurable heat produced and exported to non-UK ETS entities over the baseline period, unless used for electricity production or district heating $CLEF_H$: carbon leakage exposure factor for non-carbon leakage exposed sectors is used in the default case *If sufficient evidence can be provided, the following exceptions to the default allocation calculation are possible:*

	• Where there is a direct heat supply contract between the UK ETS heat producer and a UK ETS heat consumer, the allocation goes to the consumer instead of the producer. See section 3.1 for the preliminary allocation calculation in this case (this may apply to heat flow A1). • Where there is a proven heat supply between the UK ETS heat producer and a non-UK ETS heat consumer, the UK ETS heat producer can apply for allocation under its heat benchmark sub-installation. The preliminary allocation calculation is the same as the default case above, but the CLEF value depends on the carbon leakage exposure of the non-UK ETS consumer(s) (this may apply to heat flow A2). • Where there is a proven heat supply by the UK ETS heat producer, via a heat distributor, to district heating, the UK ETS heat producer can apply for allocation under its district heating sub-installation. See section 3.2 for the preliminary allocation calculation in this case (this may apply to heat flow A3).
Non-UK ETS installation exporting heat to heat distributor (Heat flow B)	Non-UK ETS installations cannot receive free allocation.
Heat distributor	Heat distributors are regarded as non-UK ETS entities and cannot receive free allocation (in case the heat distributor also produces and exports heat, the heat exporting part receives allocation analogous to a UK ETS installation exporting to a heat distributor).
UK ETS installation importing from a heat distributor (heat flow A1)	*In the default case,* ***heat imported from a non-UK ETS entity*** *such as a heat distributor* ***is not eligible for allocation.*** Because the heat distributor is regarded as a non-UK ETS entity, this installation will not receive any allocation for the imported heat (an exception to this case is possible; see the first exception in the first row of this table).
	Where the heat is imported to be used ***within*** *the perimeter of a* ***product benchmark sub-installation*** *(heat flow A1):*

	The imported heat is not eligible for free allocation since it comes from a non-UK ETS entity. The imported net measurable heat is however accounted for in the product benchmark[8]. The allocation therefore needs to be corrected by deducting the ineligible imported heat. $$F_{P,preliminary} = \left(BM_P \times HAL_P - BM_H \times H_{import}\right) \times CLEF_P$$ *Allocation = (product benchmark x amount of product produced – heat benchmark x non-UK ETS heat imported) x CLEF of the heat-consuming sub-installation* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year). BM_P: product benchmark (expressed in allowances/tonne) HAL_P: product-related HAL (expressed in tonnes/year) BM_H: heat benchmark (expressed in allowances/TJ) H_{import}: net measurable heat import in the same baseline years as used for HAL_P (expressed in TJ/year) $CLEF_P$: carbon leakage exposure factor of the heat-consuming sub-installation An exception is possible where there is a direct heat supply contract between the UK ETS heat producer and a UK ETS heat consumer, in which case the allocation goes to the consumer instead of the producer. See section 3.1 for the preliminary allocation calculation for this scenario (this may apply to heat flow A1).
	*Where the imported heat is to be used **outside** the perimeter of a **product benchmark sub-installation** (heat flow A1):*

	In the default case, the heat imported from non-UK ETS entities is not considered when determining the HAL of the heat-importing UK ETS installation. Consequently, the heat benchmark sub-installation does not receive any allowances for the heat imported from the heat distributor (a non-UK ETS entity). An exception is possible when there is a direct heat supply contract between the UK ETS heat producer and a UK ETS heat consumer, in which case the allocation goes to the consumer instead of the producer. See section 3.1 for the preliminary allocation calculation in this case (this may apply to heat flow A1).
Non-UK ETS installations importing heat from a heat distributor (Heat flows A2 and A3)	*Non-UK ETS installations cannot receive free allocation.*

4.3 Heat flows from a UK ETS heat exporter to district heating

Special provisions apply to net measurable heat exported for the purposes of district heating. In line with Article 16(3) of the FAR, the CLEF will remain at 0.3 after 2026 for heat exported for the purposes of district heating, in contrast to heat consumed in non-UK ETS sectors.

Figure 4 in section 4.1 provides an example of heat exported from a UK ETS installation directly to a district heating network.

Figure 6 in section 4.2 provides an example of heat exported from a UK ETS installation to a district heating network via a heat distributor.

Preliminary allocation

District heating is always considered to be non-UK ETS. Therefore, preliminary free allocation will be given to the UK ETS installation exporting the net measurable heat.

Carbon leakage exposure factor

A specific CLEF is to be used for heat exported for the purposes of district heating. As previously mentioned, this is set at 0.3 for the second allocation period, subject to the outcome of the Free Allocation Review.

Table 6 Overview of preliminary allocation when a UK ETS installation exports heat for the purpose of district heating

Heat flow	Preliminary allocation
UK ETS heat exporter	*The following formula is to be used where:* • *The heat is directly exported for the purpose of district heating, or* • *The heat is exported via a heat distributor AND proof has been provided by the heat distributor that the heat is exported for the purpose of district heating.* *If the heat is exported via a heat distributor with no proof of use of the heat for district heating, the heat must be treated as exported to a non-UK ETS entity (see section 3.2 and Table 2).* *The heat exporting sub-installation is by definition a district heating sub-installation* The heat exported to district heating is accounted for within the HAL of the district heating sub-installation: $F_{DH,preliminary} = BM_H \times HAL_{DH} \times CLEF_{DH}$ *Allocation = heat benchmark x amount of net exported heat x CLEF* where: $F_{DH,preliminary}$: annual preliminary allocation to the district heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_{DH}: district heating-related HAL (expressed in TJ/year); i.e. the arithmetic mean of annual net measurable heat produced and exported for district heating $CLEF_{DH}$: carbon leakage exposure factor for district heating
Heat distributor	Heat distributors are regarded as non-UK ETS entities and cannot receive free allocation
District heating	District heating is regarded as a non-UK ETS entity by definition and therefore cannot receive free allocation

4.4 Multiple heat exporters and one heat importer

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

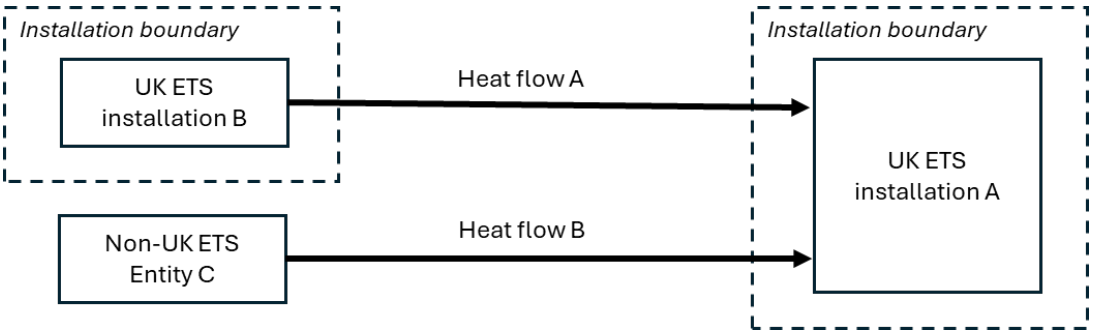

Figure 7 Schematic showing a UK ETS heat installation importing net measurable heat from both a UK ETS installation and a non-UK ETS entity

Preliminary allocation

Preliminary allocation is shown in Table 7 and is determined using the scenarios previously discussed in section 3.1 and 3.3:

- Heat import by a UK ETS sub-installation from a UK ETS installation: the allocation goes to the heat consumer (see section 3.1)
- Heat import by a UK ETS sub-installation from a non-UK ETS entity: heat import from outside the UK ETS is not eligible for allocation (see section 3.3).

Carbon leakage exposure factor

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

Table 7 Overview of preliminary allocation where a UK ETS installation imports net measurable heat from both a UK ETS sub-installation and a non-UK ETS entity

Heat flow	Preliminary allocation
UK ETS heat consumer A	*Where the imported heat is to be used **within** the perimeter of a **product benchmark sub-installation**:* The heat imported from the UK ETS (flow A) does not impact the allocation calculation, but the allocation needs to be corrected to deduct net measurable heat imported from the non-UK ETS installation or other entity. $$F_{P,preliminary} = \left(BM_P \times HAL_P - BM_H \times H_{non-UK\ ETS,import}\right) \times CLEF_P$$ *Allocation = (product benchmark x amount of product produced – heat benchmark x net measurable heat imported) x CLEF of heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year). BM_P: product benchmark (expressed in allowances/tonne) HAL_P: product-related HAL (expressed in tonnes/year) BM_H: heat benchmark (expressed in allowances/TJ) $H_{non-UK\ ETS,import}$: heat import from the non-UK ETS entities in the same baseline years as used for HAL_P (expressed in TJ/year) $CLEF_P$: carbon leakage exposure factor of the heat-consuming sub-installation

	*The heat-importing sub-installation is **not** a **product benchmark sub-installation**:* The heat imported from UK ETS installations is included within the HAL of the heat importing sub-installation. The heat imported from non-UK ETS entities is not eligible for free allocation: $$F_{H,preliminary} = BM_H \times HAL_{H,eligible} \times CLEF_H$$ *Allocation = heat benchmark x net measurable heat consumed (excluding heat from non-UK ETS entities) x CLEF* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) $HAL_{H,eligible}$: the heat-related HAL (expressed in TJ/year) - by definition, this HAL does not consider the heat imported from non-UK ETS entities $CLEF_H$: carbon leakage exposure factor of the heat-consuming sub-installation
UK ETS heat-exporter B	The part of the UK ETS installation that exports heat to other UK ETS installations does not receive any allowances for the heat export.
Non-UK ETS heat-exporter C	Non-UK ETS entities cannot receive free allocation.

5 Special allocation examples

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

This section discusses the allocation when heat flows from an installation that produces products covered by the nitric acid benchmark and another sub-installation (see Article 16(5) of the FAR).

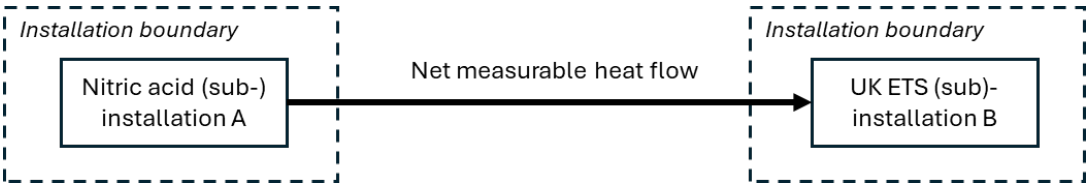

Figure 8 Schematic showing heat flows from a nitric acid benchmark sub-installation to another sub-installation

Preliminary allocation

Generally, the preliminary allocation for the nitric acid benchmark (sub-)installation A will be calculated based on the product benchmark for nitric acid and its HAL. In the case of the nitric acid benchmark, the heat produced within the boundaries of the nitric acid sub-installation and exported outside of the sub-installation boundary is allocated under the nitric acid benchmark, so the exported heat shouldn't receive allocation under another sub-installation of the same or another installation.

Therefore, the preliminary allocation for the heat-consuming (sub-)installation B needs to be adjusted to deduct allowances related to the nitric acid benchmark heat consumed, since the corresponding allowances are allocated to the nitric acid producer.

An overview of the preliminary allocation is given Table 8.

Carbon leakage exposure factor

The carbon leakage exposure factor to be used to determine the allocation to (sub-) installation B is the CLEF for the heat-consuming sub-installation.

Table 8 Overview of preliminary allocation for net measurable heat flow from a nitric acid installation to another (sub-) installations or entity

<table>
<tr><th>Preliminary allocation to heat-exporting nitric acid (sub-) installation A</th><th>Preliminary allocation to heat-importing sub-installation B</th></tr>
<tr><td rowspan="2">Allocation is given to the nitric acid producer based on the nitric acid benchmark, with no additional allocation for the exported heat

A (sub-)installation that exports heat to another (sub-)installation never receives any allowances for the heat export</td><td>Where the imported heat is used within the perimeter of a product benchmark sub-installation:

The imported heat is not eligible for free allocation. However, as the imported net measurable heat is accounted for in the product benchmark[7], the allocation needs to be corrected accordingly.

$$F_{P,preliminary} = \left(BM_P \times HAL_P - BM_H \times H_{nitric\ acid,import}\right) \times CLEF_P$$

Allocation = (product benchmark x amount of product produced – heat benchmark x nitric acid measurable heat imported) x CLEF of the heat-consuming sub-installation

where:

$F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year).
BM_P: product benchmark (expressed in allowances/tonne)
HAL_P: product-related HAL (expressed in tonnes/year)
BM_H: heat benchmark (expressed in allowances/TJ)
$H_{nitric\ acid,import}$: the net measurable heat import from a nitric acid sub-installation in the same baseline years as used for HAL_P (expressed in TJ/year)
$CLEF_P$: carbon leakage exposure factor of the heat-consuming sub-installation</td></tr>
<tr><td>Where the heat-importing sub-installation is a heat benchmark sub-installation, the heat imported from a nitric acid sub-installation is non-eligible and therefore subtracted from the total heat HAL.</td></tr>
</table>

	$$F_{H,preliminary} = BM_H \times (HAL_{H,total} - H_{nitric\ acid,import}) \times CLEF_H$$ *Allocation = heat benchmark x (total net measurable heat consumed – net measurable heat consumed from nitric acid installation) x CLEF of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year). BM_H: heat benchmark (expressed in allowances/TJ) $HAL_{H,total}$: the total net measurable heat-related HAL (expressed in TJ/year); i.e., the arithmetic mean of the annual net measurable heat consumed (other than for electricity production or district heating) over the baseline period $H_{nitric\ acid,import}$: the net measurable heat import from a nitric acid sub-installation in the same baseline years as used for $HAL_{H,total}$ (expressed in TJ/year) $CLEF_P$: carbon leakage exposure factor of the of the heat consumer
	*Where the **heat-importing** installation contains a **district heating sub-installation**, the heat imported from a nitric acid sub-installation is non-eligible. If installation B exports heat for district heating purposes and nitric acid is not the only heat source, the heat from nitric acid must be subtracted from the total district heating HAL.* $$F_{H,preliminary} = BM_H \times (HAL_{DH,total} - H_{nitric\ acid,import}) \times CLEF_{DH}$$ *Allocation = heat benchmark x (total net measurable heat exported to district heating – net measurable heat consumed from nitric acid installation) x CLEF of the heat consumer* where: $F_{P,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed

		in allowances/year).
	BM_H:	heat benchmark (expressed in allowances/TJ)
	$HAL_{DH,total}$:	total net measurable heat-related HAL (expressed in TJ/year); i.e., the arithmetic mean of the annual net measurable heat consumed (other than for electricity production or district heating) over the baseline period
	$H_{nitric\ acid,import}$:	the net measurable heat import from a nitric acid sub-installation in the same baseline years as used for $HAL_{DH,total}$ (expressed in TJ/year)
	$CLEF_P$:	carbon leakage exposure factor of district heating
	Where the heat-importing entity is not covered by UK ETS neither the heat-exporting nitric acid sub-installation nor the non-UK ETS entity receive any allocation.	

5.2 Heat flows within an integrated paper mill

This section covers the allocation for heat flows within an integrated paper mill. An integrated paper mill includes at least one pulp product benchmark sub-installation and one paper product benchmark sub-installation. It is not uncommon for an integrated paper mill to also have a heat benchmark sub-installation, which would only be needed if:

- The integrated paper mill also produces products that are not covered by a product benchmark
- The integrated paper mill exports heat to non-UK ETS entities (other than for district heating, which has its own sub-installation type).

For all pulp production except recovered paper pulp, free allocation is only applicable for the pulp placed on the market and not processed into paper in the same installation or a technically-connected installation.[10] This also applies to heat recovered from any pulp benchmark other than recovered paper pulp e.g. if a pulp mill produces 100 tonnes of pulp but only 1 air-dried tonne is sold on the market, then only 1 air-dried tonne is eligible for free allocation under this benchmark.

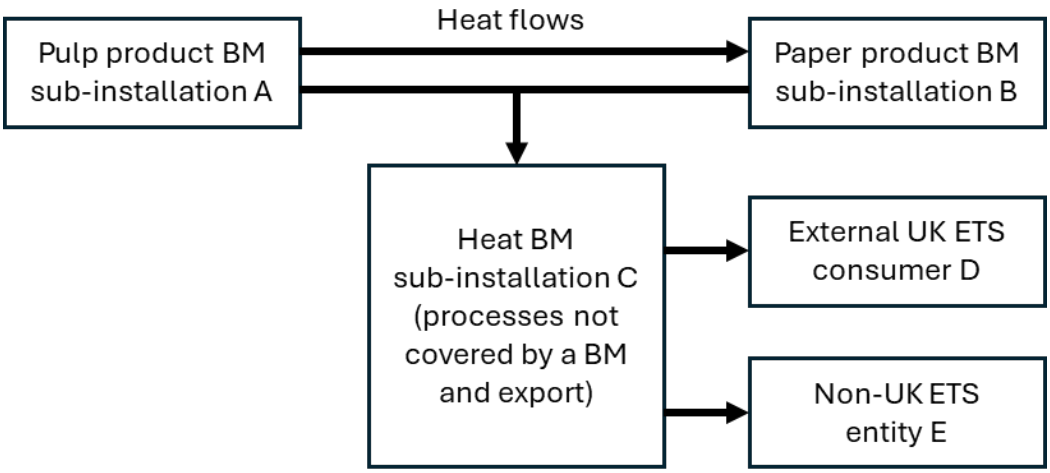

Figure 9 Schematic showing heat flows in an example integrated paper mill

Preliminary allocation

Generally, the preliminary allocation for an integrated paper mill will be based on the sum of the allocation for both product benchmark sub-installations (pulp and paper) and the heat benchmark sub-installation (covering either products not included within either benchmark or

[10] Article 16(6) of the FAR states: "*Where an installation encompasses sub-installations producing pulp (short fibre kraft pulp, long fibre kraft pulp, thermos-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.*"

exported heat to a non-UK ETS entity). The preliminary allocation for the pulp product sub-installation A will be calculated based on the product benchmark for the pulp product and the HAL of the pulp that is produced and placed on the market and not processed into paper in sub-installation B. As is the case with all product benchmark sub-installations, any heat produced and/or consumed within the boundaries of a pulp benchmark sub-installation is included in the benchmark definition; this heat will therefore not receive any additional allocation under a heat benchmark sub-installation.

The preliminary allocation for the paper product sub-installation B will be calculated based on the product benchmark for the paper product and the HAL 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 C will only receive allocation for the net measurable heat that is consumed at the installation outside of the boundaries of the product benchmark sub-installations for pulp and paper, as well as the net measurable heat delivered to external non-UK ETS consumers. Should any net measurable heat be exported to district heating it will receive allocation under a district heating sub-installation.

An overview of the preliminary allocation is given Table 9.

Carbon leakage exposure factor

For both product benchmark sub-installations and the heat benchmark sub- installation(s), the respective carbon leakage exposure factors must be applied.

Table 9 Overview of preliminary allocation for an example integrated paper mill with net measurable heat flows both within and across its boundaries

Sub-installation	Preliminary allocation
Preliminary allocation to pulp product sub-installation A	*The part of the **pulp produced in sub-installation A that is transferred to paper sub-installation B is not eligible for allocation**. All heat consumed in sub-installation A, even if produced outside of its boundaries, is included in the benchmark definition, therefore this sub-installation does not receive any additional allowances for the production or consumption of heat.*
	Allocation is given to the pulp product sub-installation based on the respective pulp benchmark, but (except for recovered paper pulp) this is only for pulp production entering the market and not processed into paper in sub-installation B. $F_{P,preliminary} = BM_P \times HAL_{P,export} \times CLEF_P$ *Allocation = product benchmark x amount of produced pulp placed on market x CLEF of pulp production* where: $F_{P,preliminary}$: annual preliminary allocation to the pulp-producing sub-installation (expressed in allowances/yea BM_P: product benchmark (expressed in allowances/tonne) $HAL_{P,export}$: HAL related to the production of pulp that is placed on the market and not processed in sub-installation B (expressed in tonne/year) $CLEF_p$: carbon leakage exposure factor of pulp production
Preliminary allocation to paper product sub-installation B	Allocation is given to the paper product sub-installation based on the respective paper benchmark. $F_{P,preliminary} = BM_P \times HAL_P \times CLEF_P$ *Allocation = product benchmark x amount of product produced x CLEF of paper production* where:

	$F_{P,preliminary}$: annual preliminary allocation to the paper-producing sub-installation (expressed in allowances/ye BM_P: product benchmark (expressed in allowances/tonne) HAL_P: product-related historical activity level (expressed in tonne/year) $CLEF_p$: carbon leakage exposure factor of paper production This sub-installation does not receive any additional allowances for the production or consumption of heat.
Preliminary allocation to heat consuming sub-installation C	*Where **heat is consumed inside the installation <u>and</u> outside the boundaries of all product benchmark sub-installations**:* $$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x net measurable heat consumed outside boundaries of product benchmarks x CLEF of the heat consuming process* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-importing sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_H: net measurable heat-related HAL (expressed in TJ/year); i.e. the arithmetic mean of the annual net measurable heat consumption outside the boundaries of product benchmark over the baseline period $CLEF_H$: carbon leakage exposure factor of the heat-consuming process
	Where heat is exported to external UK ETS consumer D: The exporting sub-installation receives no allocation for heat exported to UK ETS consumers.

	Where heat is exported to a non-UK ETS entity E (other than for district heating): The net measurable heat exported to non-UK ETS entities is accounted for in the HAL of the heat exporting sub-installation: $$F_{H,preliminary} = BM_H \times HAL_H \times CLEF_H$$ *Allocation = heat benchmark x amount of net measurable heat exported x CLEF* where: $F_{H,preliminary}$: annual preliminary allocation to the heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_H: net measurable heat-related HAL (expressed in TJ/year); i.e. the annual arithmetic mean of historical net measurable heat produced and exported to non-UK ETS entities over the baseline period, unless used for electricity production or district heating. $CLEF_H$: carbon leakage exposure factor for non-carbon leakage exposed sectors is used, unless the heat exporter provides evidence that it exports heat to a non-UK ETS entity that is exposed to a significant risk of carbon leakage
	*Where **heat is exported for district heating**, the exporting UK ETS installation receives allocation under **a district heating sub-installation**:* If heat is exported to district heating, then an additional district heating benchmark sub-installation is needed (not shown in Figure 9). Allocation to that additional sub-installation would be accounted for within the HAL of the district heating sub-installation. $$F_{DH,preliminary} = BM_H \times HAL_{DH} \times CLEF_{DH}$$

	Allocation = heat benchmark x amount of net exported heat x CLEF where: $F_{DH,preliminary}$: annual preliminary allocation to the district heat-exporting sub-installation (expressed in allowances/year) BM_H: heat benchmark (expressed in allowances/TJ) HAL_{DH}: district heating-related HAL (expressed in TJ/year); i.e. the arithmetic mean of annual net measurable heat produced and exported for district heating $CLEF_{DH}$: carbon leakage exposure factor for district heating
Preliminary allocation to external UK ETS consumer D	*The allocation to a UK ETS installation that imports heat from another UK ETS installation that includes a pulp benchmark sub-installation is the same as import from any other UK ETS installation: the free allocation goes to the importing installation. See section 3.1 for the preliminary allocation calculation method.*
Preliminary allocation to non-UK ETS entity E	*Non-UK ETS entities cannot receive free allocation*

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