Phase III Allocation Workshop
Green Isle Hotel
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Benchmarks and Allocation Rules

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An Ghníomhaireacht um Chaomhnú Comhshaoil

Phase III allocation- overview

- No free allocation to electricity production and **Benchmarks** to be used as basis of free allocation wherever possible for other sectors.
- Where a product is exposed to *carbon leakage* get 100% of the BM throughout the trading period
- Otherwise the allocation decreases as a proportion of the BM from 80% in 2013 to 30% in 2020.
- MS to publish preliminary free allocation by 30 September 2011
- Auctioning of allowances in accordance with the regulation on auctioning
- "*Carbon Leakage*" (CL)= risk to see industrial GHG emissions increase outside EU-ETS where industry would not be subject to comparable carbon constraints

Legislation for data collection process

- Directive 2003/87/EC as amended by 2009/29/EC
- Draft Commission Decision on determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC (CIMS)
- Transposition is SI 161 of 2010 as amended by SI 127 of 2011.
- Closing date for submission of verified data to EPA in order to apply for free allocation in Phase 3 is **30 June 2011.**

Product Benchmarks in draft CIMS

- 53 Benchmarks in 21 sectors, based on
  - Benchmark curves (28 benchmarks)
  - Benchmark curves & corrections (2 benchmarks)
  - Sample benchmark curves & check against BAT (14 benchmarks)
  - Complexity Weighted Ton approach for refineries (3 benchmarks)
  - 6 benchmarks based on literature information

Benchmarks of interest to Ireland

- Oil refinery products
- Grey cement clinker
- Lime
- Gypsum Plaster & Plasterboard
- Facing Bricks
- Note: benchmark for alumina was dropped

Non-benchmarked products

- "Fall-back approach" - Hierarchy

1. Heat Production Benchmark – emissions related to energy output (62.3 allowances/ TJ net heat produced)
2. Fuel mix Benchmark (56.1 allowances /TJ fuel used)
3. Process emissions benchmark (0.97 allowances/tCO_2 process emissions)

The ‘road’ to allocation

1. Operators apply for free allocation by providing
   - Verified data (data collection template)
   - The way the data has been obtained (methodology report)
2. CA prepares NIMS
3. Commission evaluates NIMs and determines the need for a cross-sectoral correction factor
4. CA determines final allocation

The Commission provides

- Guidance Documents
- A helpdesk for CA
- A data collection template
- A template for the methodology report

The data collection template applies the allocation methodology using the provided data. So the calculation in this presentation, are in principle performed automatically.

The following documents describe the allocation methodology

- Commission Decision provides the Community Implementation Measures (CIMs) = legal context for application of allocation rules
- Guidance documents provide further guidance for correct and harmonized application:
  1. **General guidance**
  2. **Guidance on allocation methodologies**
  3. **Guidance on data collection**
  4. Guidance on verification (first draft only)
  5. **Guidance on carbon leakage**
  6. **Guidance on cross-boundary heat flows**
  7. Guidance on new entrants/closures (no draft yet)
  8. **Guidance on waste gases and process emissions**
  9. **Sector specific guidance**

Each activity is either deemed to be exposed to a significant risk of carbon leakage or not

- The allocation takes into account a Carbon Leakage Exposure Factor (CLEF)

	2013	2014	2015	2016	2017	2018	2019	2020
Exposed activities	1	1	1	1	1	1	1	1
Not exposed activities	0.8000	0.7286	0.6571	0.5857	0.5143	0.4429	0.3714	0.3000

- The carbon leakage status of industrial processes are defined in a Commission Decision - 2010/2/EU of 24 December 2009
- Activities are defined on the basis of NACE 1.1 or PRODCOM 2007 classifications
- The carbon leakage status of a sector may be revised in the future
- CIMs give CLEF related to each product benchmark

Divide the installation into sub-installations

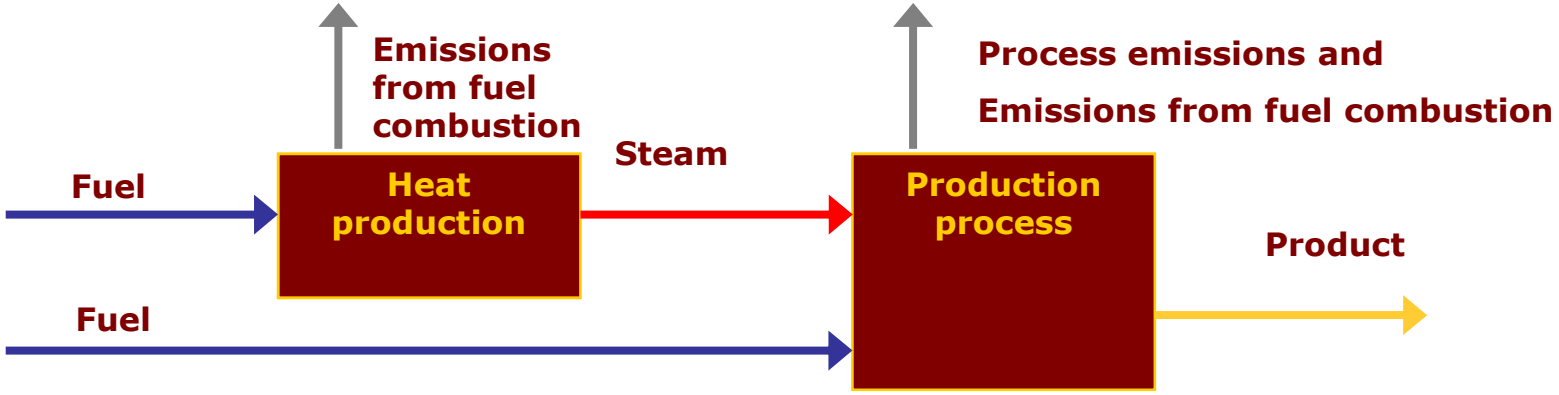
A sub-installation means all inputs, outputs and corresponding emissions related to a specific allocation regime

There are;

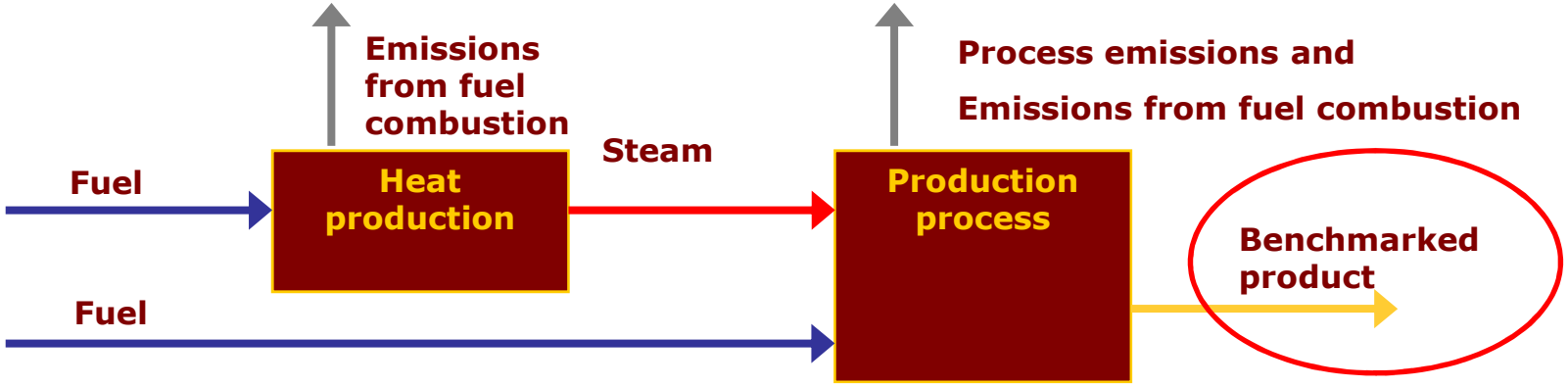
- 52 types of **product benchmark sub-installations**
  Since there are 52 product benchmarks
- 2 types of **heat benchmark sub-installations**
  1 exposed to carbon leakage and 1 not exposed
- 2 types of **fuel benchmark sub-installations**
  1 exposed to carbon leakage and 1 not exposed
- 2 types of **Process emissions sub-installations**
  1 exposed to carbon leakage and 1 not exposed

- To avoid double counting, sub-installations should never overlap!

Let's consider the following generic production process

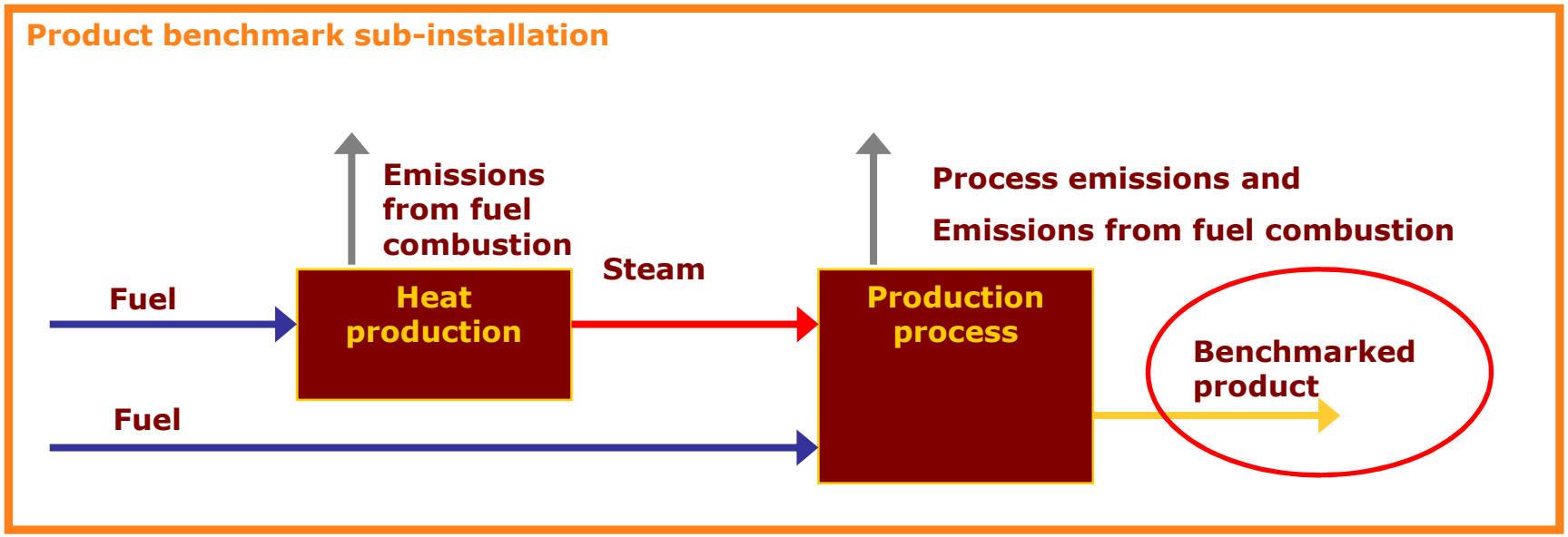


Allocation in case of production of benchmarked product

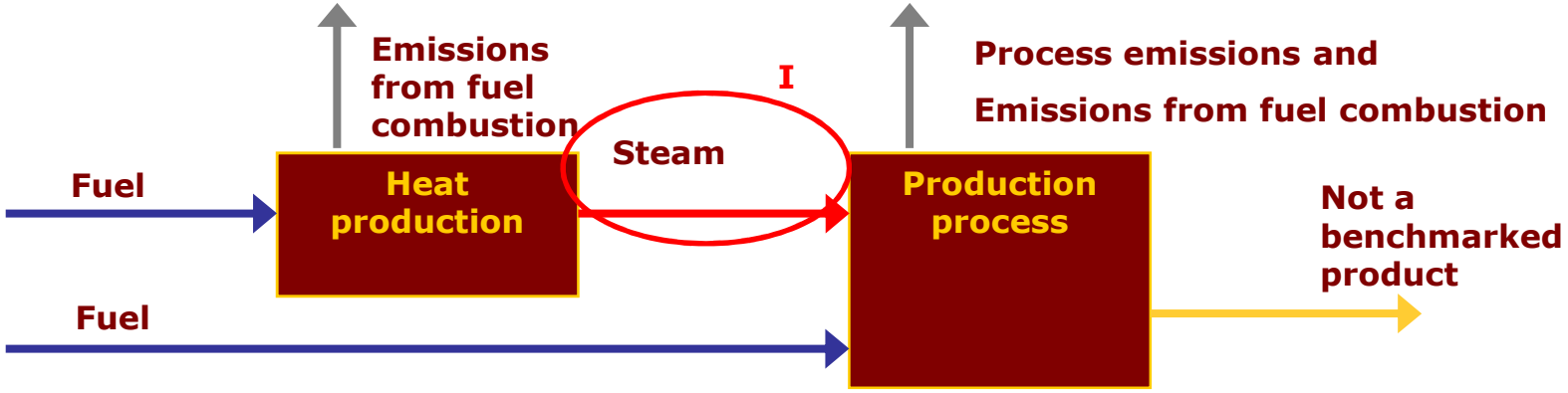


Product bench-mark	Measurable heat consump-tion	Fuel consump-tion	Process emissions	Allocation (not considering carbon leakage, linear reduction/cross sectoral correction)
Yes	-	-	-	Product benchmark x Production
No	Yes	-	-	Heat benchmark x Measurable heat consumption
No	-	Yes	-	Fuel benchmark x Fuel combustion
No	-	-	Yes	0.97 x Process emissions
No	-	-	-	No allocation

Sub-installation in case of production of benchmarked product



Allocation for non- benchmarked products



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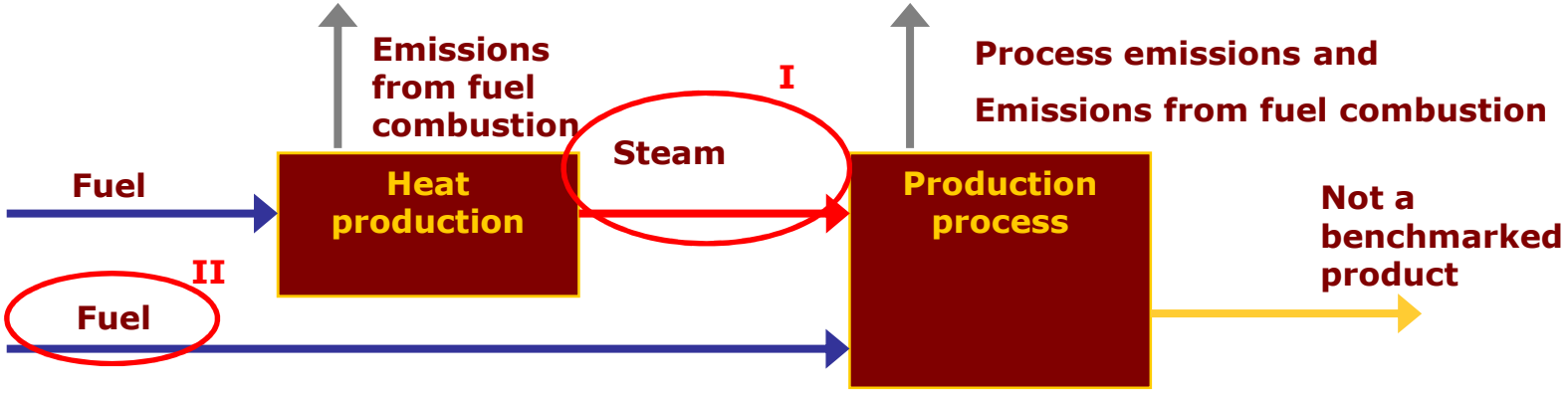
No	-	-	-	No allocation

Allocation in case of production of non-benchmarked products



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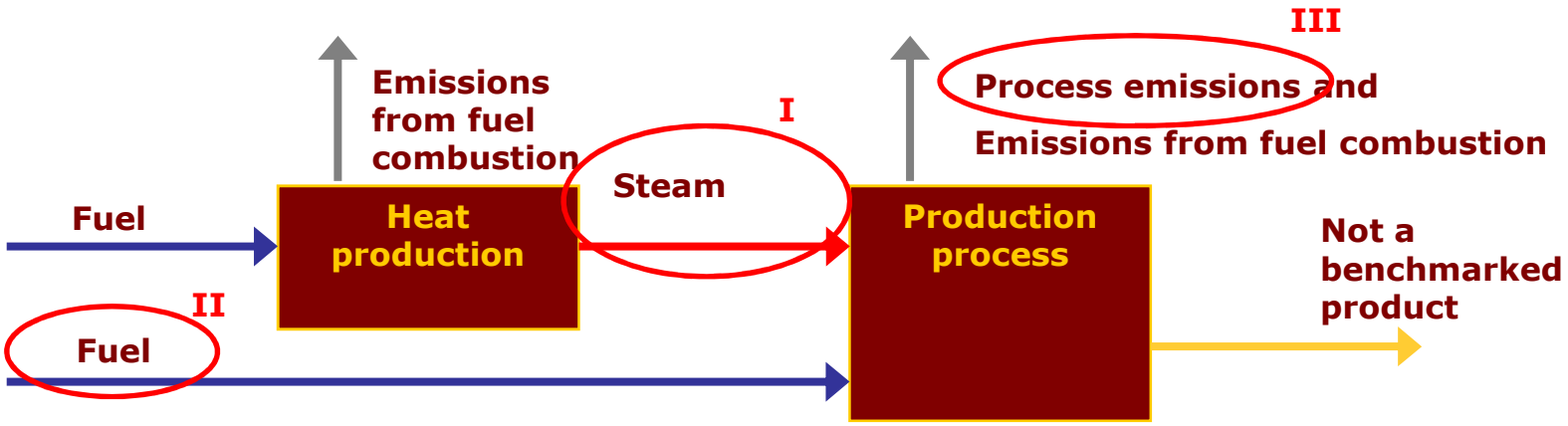
II	No	-	Yes	-	Fuel benchmark x Fuel combustion
	No	-	-	Yes	0.97 x Process emissions
	No	-	-	-	No allocation

Allocation in case of production of non-benchmarked products



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No	Yes	-	-	Heat benchmark x Measurable heat consumption
No	-	Yes	-	Fuel benchmark x Fuel combustion
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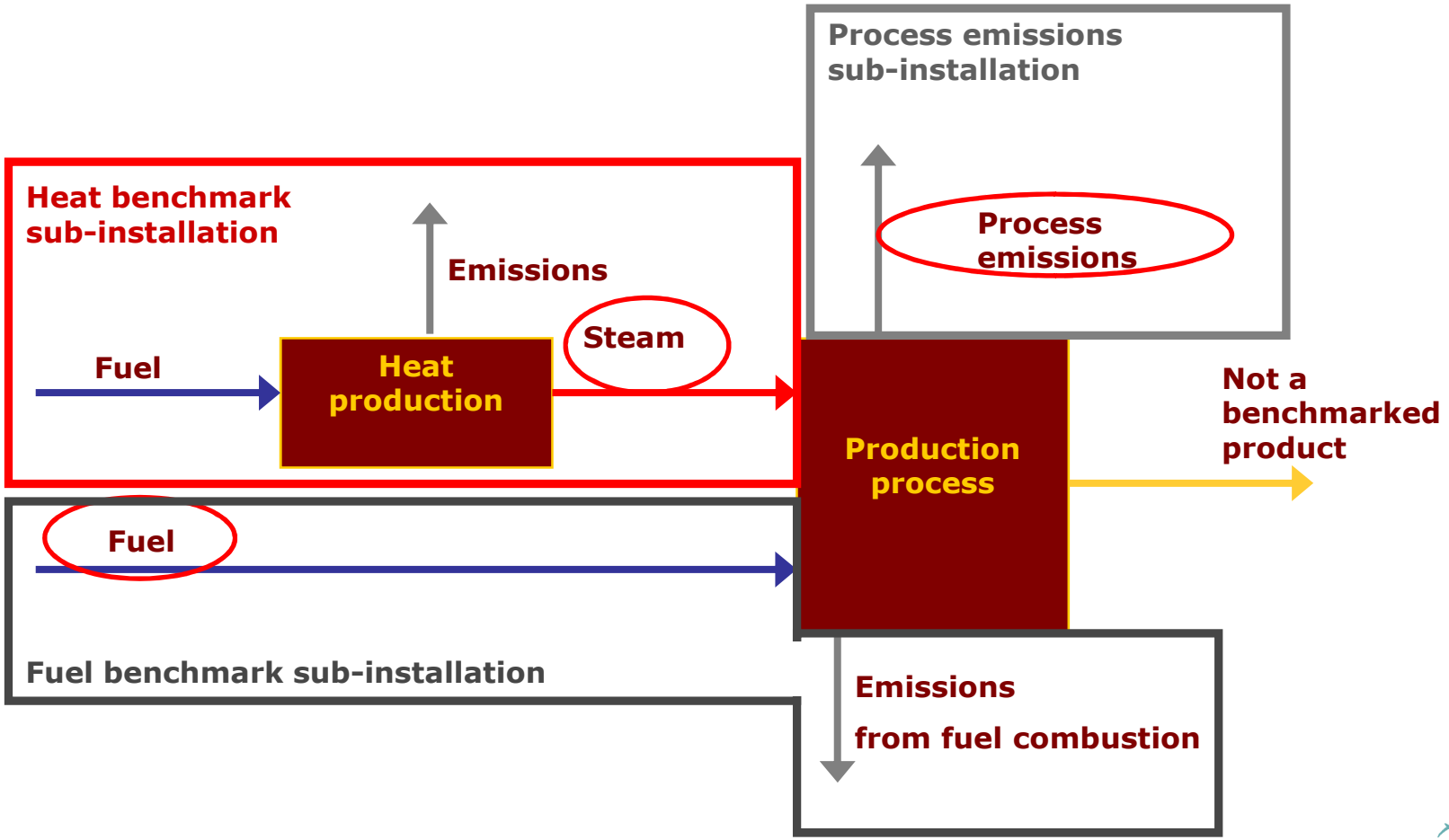
No	-	-	-	No allocation

I

II

III

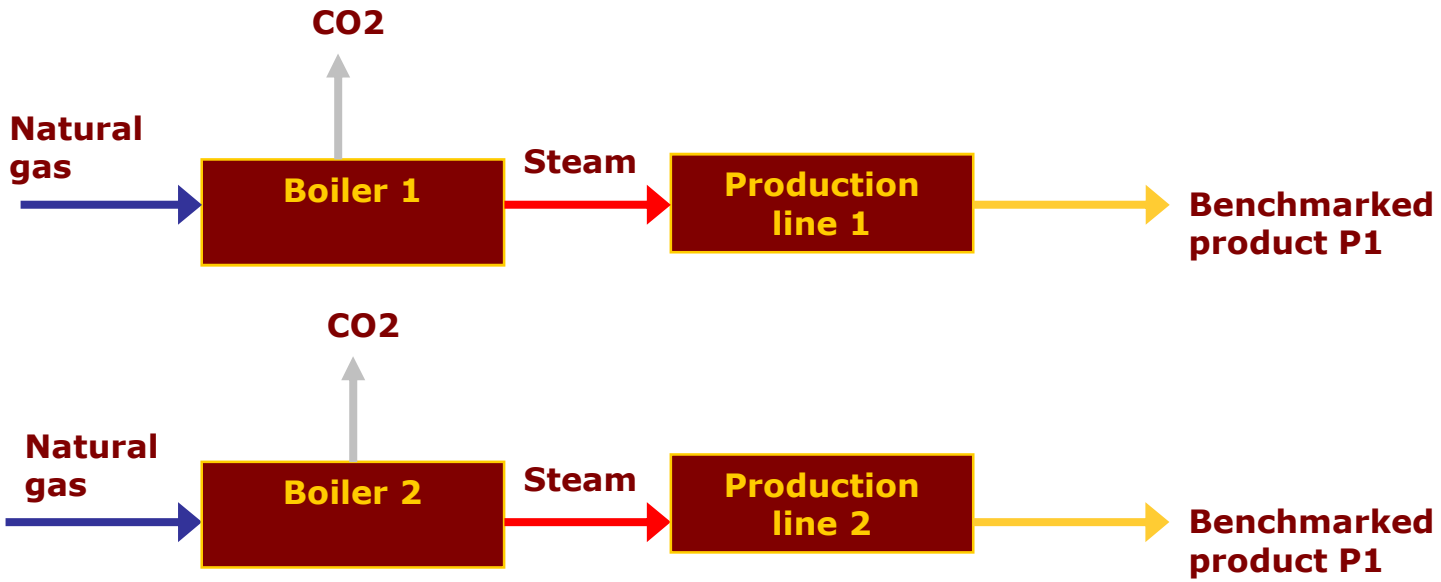
Sub-installations in case of production of non-benchmarked products



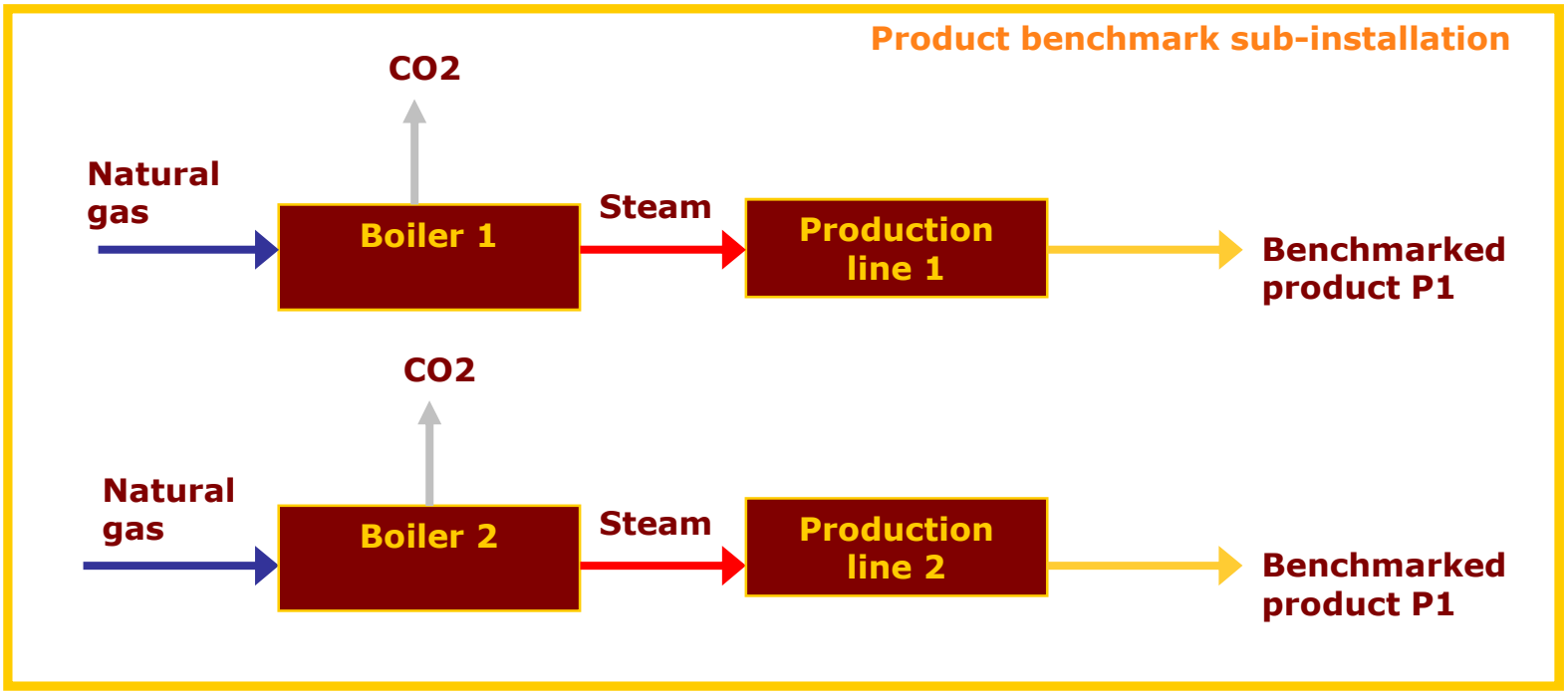
There is not necessarily a one-to-one relation between sub-installation and physical units

- 1 physical unit can be part of multiple sub-installations
- 1 sub-installation can contain multiple physical units

One sub-installation can cover multiple production lines and process units

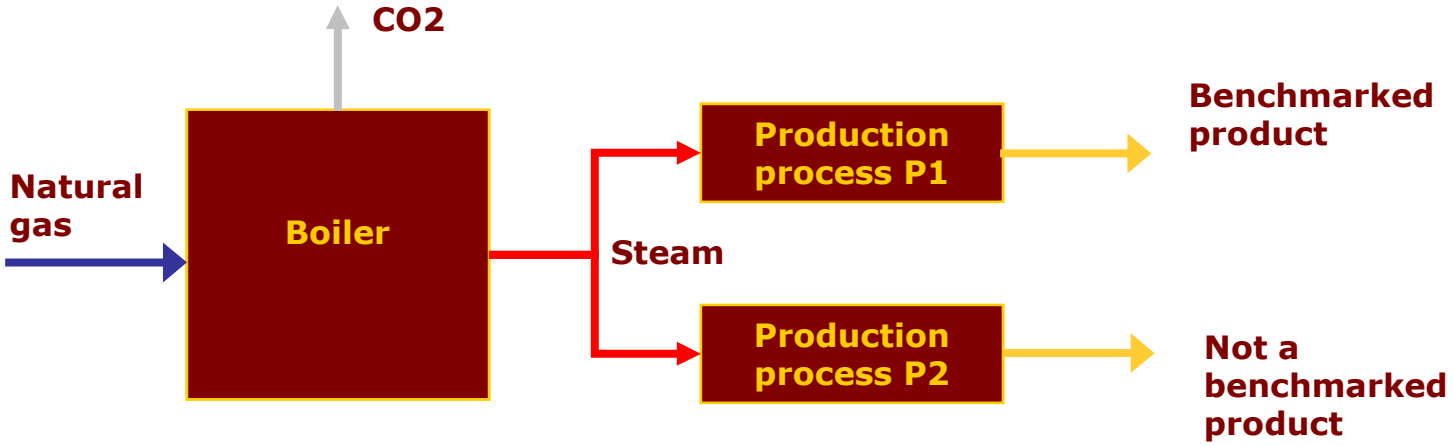


One sub-installation can cover multiple production line and process units

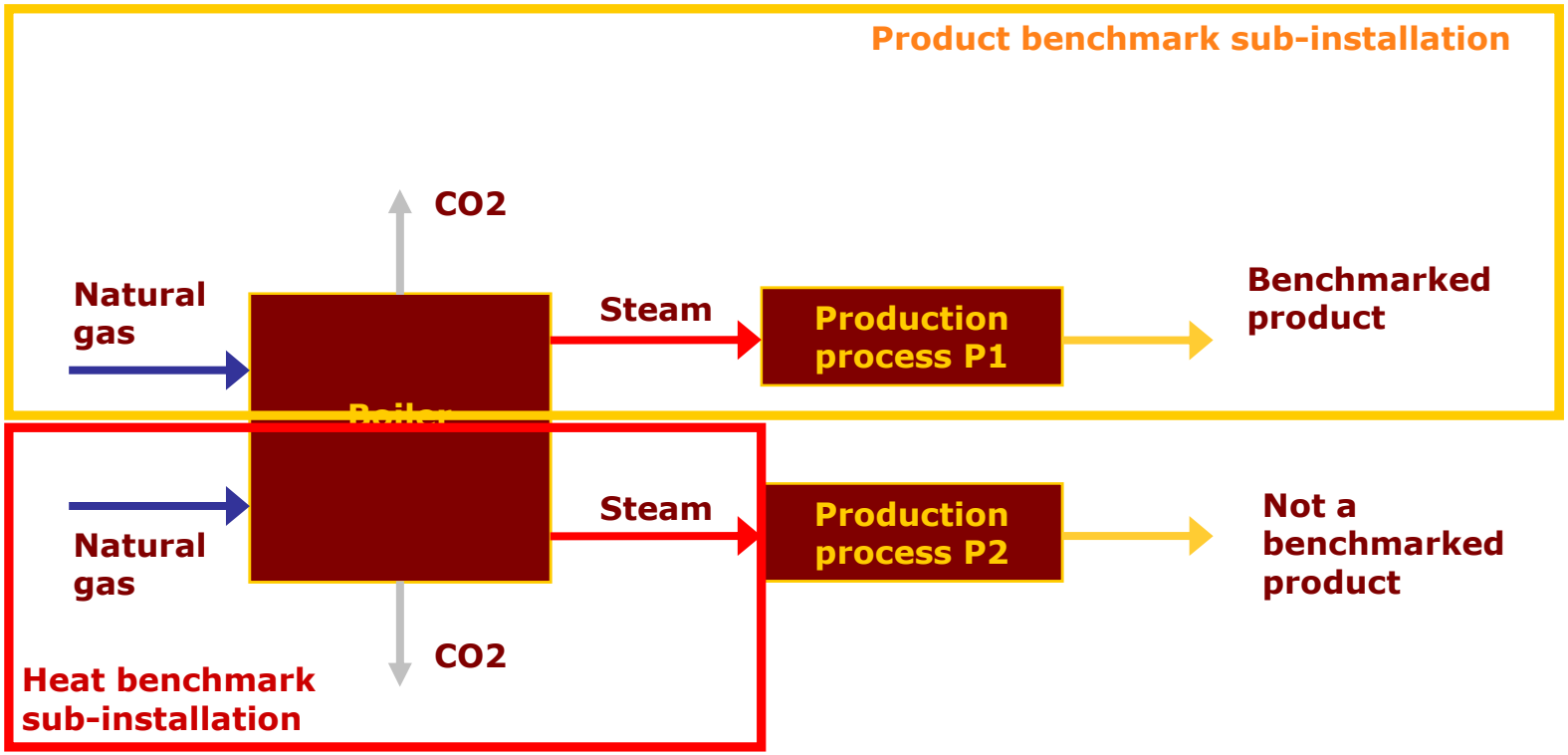


One product benchmark sub-installation since only production of one benchmarked product

One unit can be part of multiple sub-installations



One unit can be part of multiple sub-installations

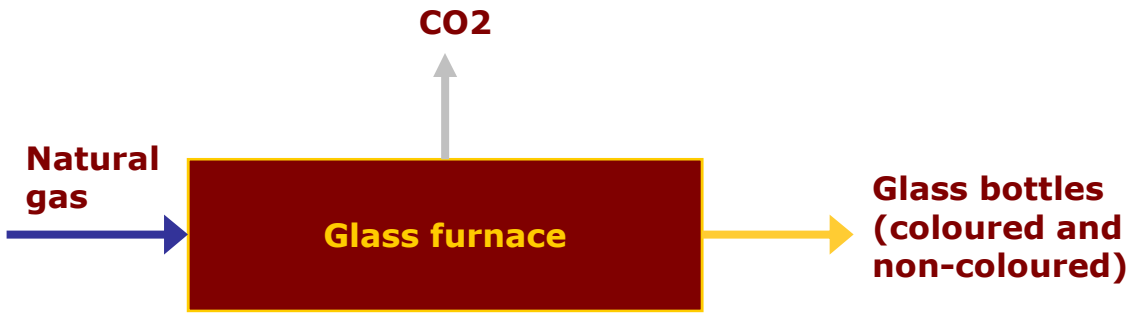


Attribution to sub-installations of inputs, outputs and corresponding emission can be based on... (Art. 7(6))

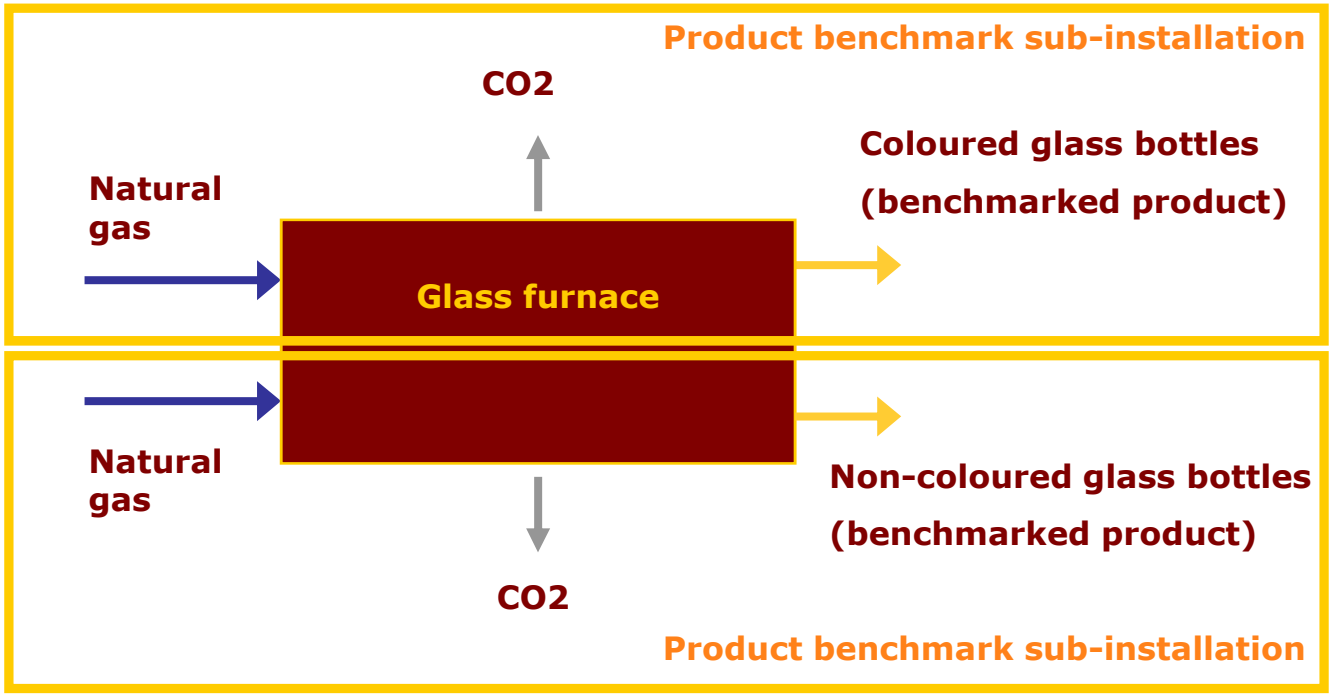
- Usage time per year for each sub-installation.
- Mass or volume of individual products
- Estimates based on the ratio of free reaction enthalpies
- Another suitable distribution key corraborated by a sound scientific methodology

In some cases, the attribution has no effect on the historical activity level and allocation, in others it has.

A single unit produces different benchmarked products in time

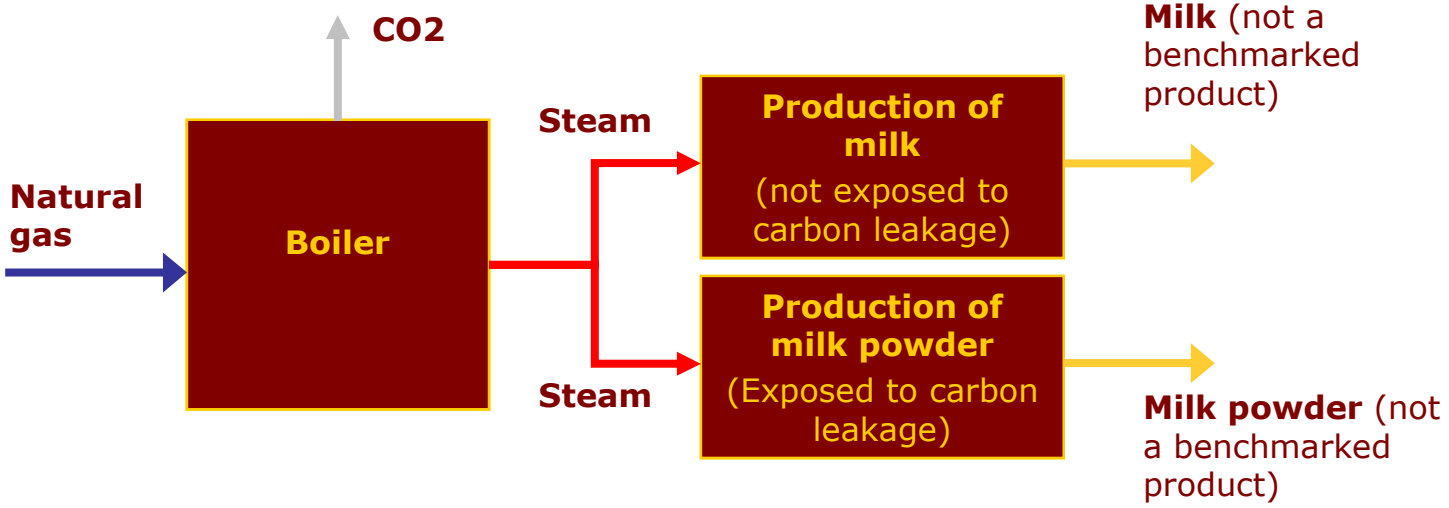


Fuel input and emissions are split…



Note: apart from the furnace, the product benchmark sub-installations cover more production units not shown here

Two heat benchmark sub-installations because of different carbon leakage status of the products produced



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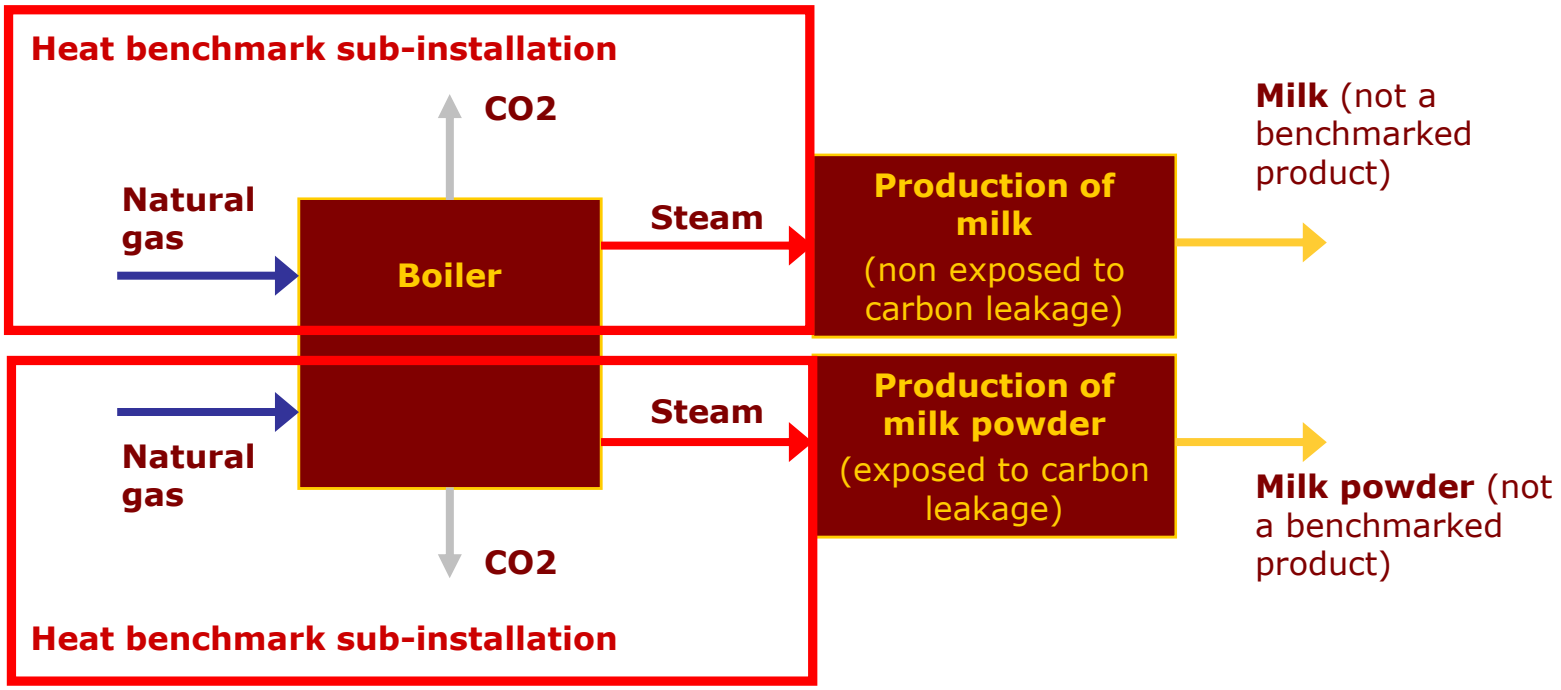


Only relevant inputs and outputs should be attributed

Fuel and emissions

- Only source streams as monitored according to the MRGs and listed within the monitoring plan, if any.
- Source stream means a fuel type, raw material and process emissions giving rise to emissions of relevant greenhouse gases at one or more emission sources as a result of its consumption or production.

Heat: only heat related to ETS source streams is relevant - **Could change**

Relevant	Not relevant
Heat produced from fossil fuels	Heat produced through electric boilers
Heat produced from biomass combustion	Heat recovered from exothermic reactions from non ETS activities
Heat recovered from exothermic reactions from ETS activities	Heat produced or recovered via renewable sources not involving combustion processes
	Heat produced via incineration of hazardous or municipal waste

The maximum number of sub-installations per installation is

N+6

- N = Number of product benchmark sub-installations
- 6 = 3 x 2:
  - 3: Heat benchmark, fuel benchmark and process emissions sub-installations
  - 2: carbon leakage exposed and not carbon leakage exposed

Stepwise approach to determine allocation

1. **a) Define relevant sub-installations**

   b) attribute relevant inputs /outputs (to prevent omissions or overlaps)

2. **Determine historical activity level per sub-installation**

3. **Determine preliminary allocation**

4. **Determine total final allocation (not part of NIMs)**

Step 1 for product benchmark sub-installations

Step 1

- Define a product benchmark sub-installation for each benchmarked product
- Attribute relevant inputs (= fuels, heat, and electricity) and outputs (= production, heat, process emissions)

Definitions of products and system boundaries of product benchmarks are needed in this step:

- Definitions are given in the CIMS
- Additional explanation are provided by guidance document 9.

Step 1 for heat benchmark sub-installations

Step 1

- (If applicable) Define one or two heat benchmark sub-installations (dependent on one or two CL-status)
- Attribute relevant inputs (= fuels for heat production, heat) and outputs (= heat, emissions from heat production)

Heat benchmark sub-installations cover measurable heat:

- Related to an ETS source steam in the installation itself or another ETS installation
- Consumed in the installation outside boundaries of product benchmark sub-installations provided that
  - The heat is not produced by a nitric acid sub-installation
  - The heat is not used for the production of electricity
- Exported to non-ETS installations, provided that
  - The heat is not produced by a nitric acid sub-installation
  - The heat is not used for the production of electricity

Heat benchmark sub-installations only cover measurable heat

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)

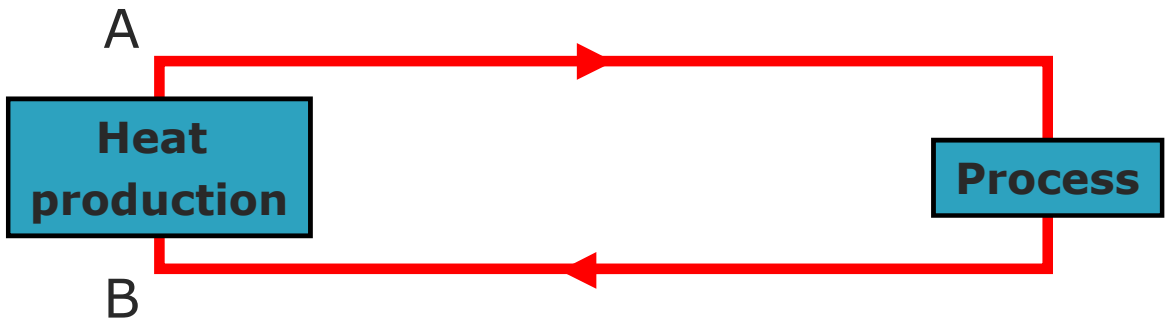
Four methods exist to determine net measurable heat flows

1. Use of measured data (temperature, pressure and flow rates)
2. Use of documentation (invoices, company internal accounting, any documentation that report heat flows determined according to sound and transparent methodologies)
3. Use of proxy based on fuel consumption and design efficiency
4. Use of proxy based on fuel consumption and reference efficiency

The approach that:

- Lead to the *highest achievable accuracy*
- Avoids any overestimations/over allocation

Method 1: Use of measured data



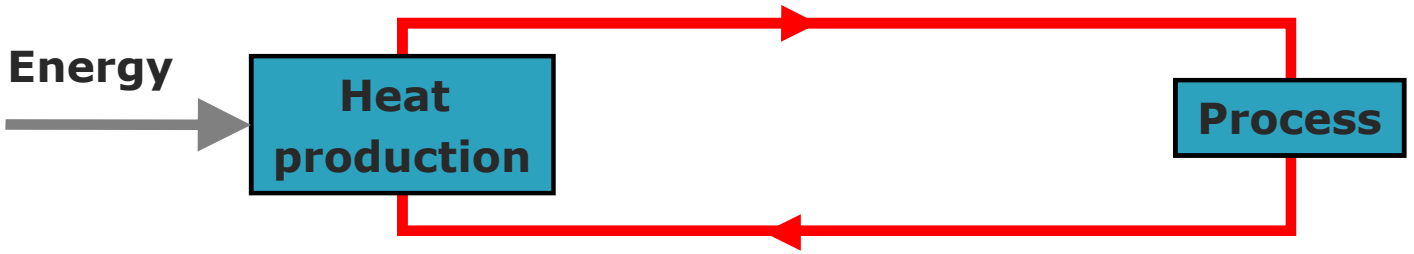
Volumetric flow rate (m^3/s) x density (kg/m^3)

Heat flow rate (kJ/s)= mass flow rate (kg/s) x specific enthalpy difference over A and B (kJ/kg)

Or, $\dot{Q} = \dot{m} \cdot (h_A - h_B)$

Enthalpy (h) is a measure for the total energy and is a function of temperature (T) and pressure (p): *h(T,p)*

Methods 3 and 4: Use of proxy



Heat flow (TJ) = Energy input (TJ) x Conversion efficiency

Or, $Q = E_{in} \cdot \eta$

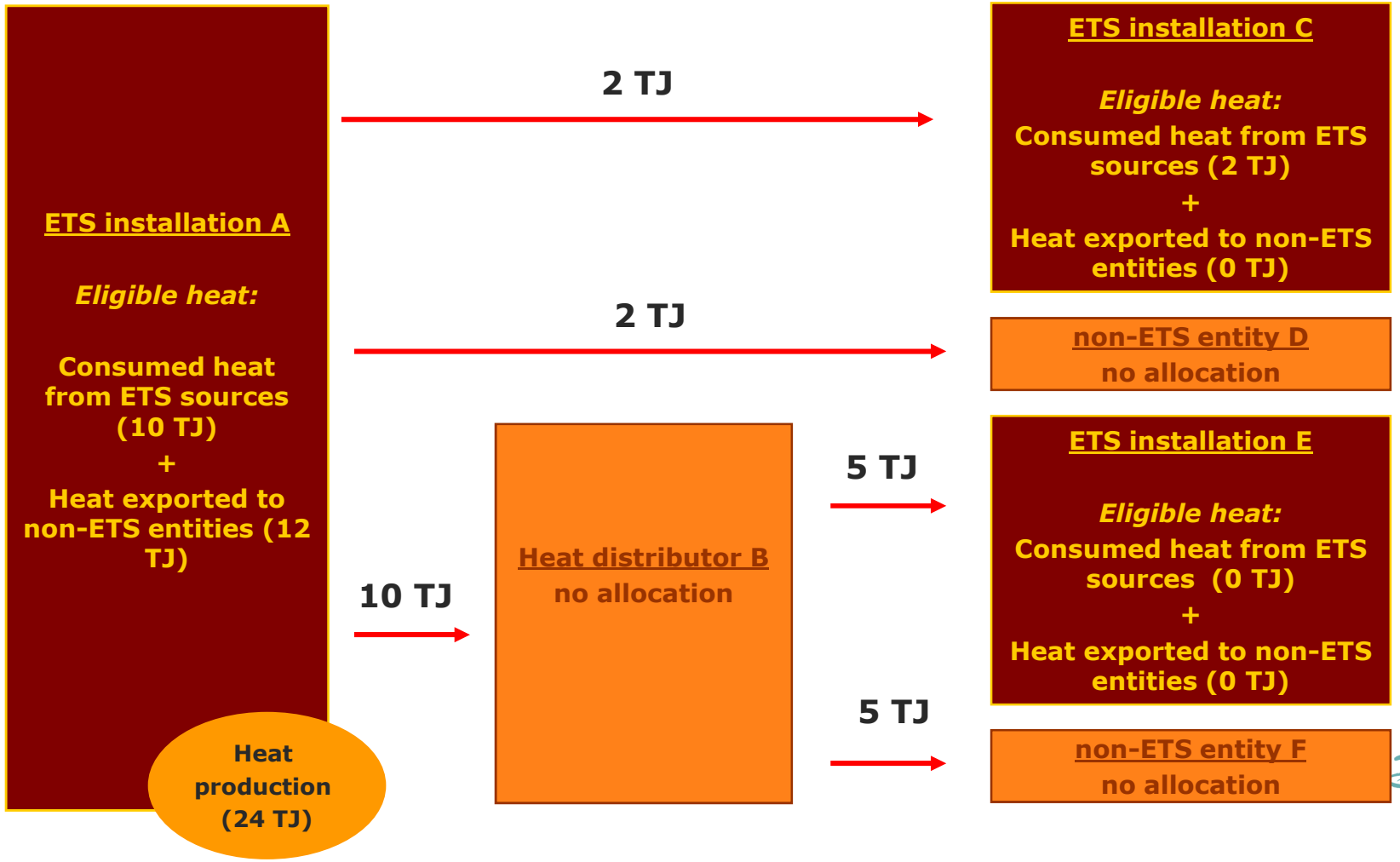
Method 3: The efficiency is the measured efficiency for heat production based on suitable measurements carried out under the supervision of the verifier which should refer to technical documentation of the installation, specifically the specific part load curve of the devices concerned.

Method 4: The efficiency is a reference efficiency ($\eta_{reference}$)

General guidance on determination of net measurable heat flows

- **Net heat flows are calculated as if all condensate is returned even if this not the case.**
  - In case condensate is not returned a reference temperature of 90°C is assumed for returned condensate.
  - The leads to same result in case all condensate is returned and in case not all condensate is returned. However, in case not all condensate is returned, the efficiency will be lower, so a smaller share of the emissions are allocated for free.
- **Steam that is vented to the atmosphere should not be part of the heat benchmark sub-installation;** if included in the calculated heat flow, it should be deducted.

Heat covered by heat benchmark sub-installation



Step 1 for fuel benchmark sub-installations

Step 1

- (If applicable) Define one or two fuel benchmark sub-installations (dependent on one or two CL-status)
- Attribute relevant inputs (= fuels) and outputs (= emissions from fuel combustion)

Fuel benchmark sub-installations cover:

- Fuel consumption outside the boundaries of a product benchmark sub-installation, provided that the fuel is used for:
  - Direct heating or cooling production *without* heat transfer medium
  - The production of products
  - The production of mechanical energy, which is not used for the production of electricity
- Provided that
  - The fuel is not used for the production measurable heat or electricity (directly of indirectly via production of mechanical energy)
  - The fuel is not flared (unless it is for safety flaring)

Step 1 for process emissions benchmark sub-installations

Step 1

- (If applicable) Define one or two process emissions sub-installations (dependent on one or two CL-status)
- Attribute relevant inputs and outputs (= process emissions)

Process emissions sub-installations cover three types of emissions

a. non-CO_2 greenhouse gas emissions covered by the ETS outside the boundaries of product benchmark sub-installations

b. CO_2 emissions produced by any of the activities below

c. Part of the emissions from the combustion of incompletely oxidized carbon emitted by any of the activities below

Definition of activity	Example
Chemical or electrolytic reduction of metal compounds in ores, concentrates and secondary materials	Production of copper from copper carbonate minerals
Removal of impurities from metals and metal compounds	Emissions from the oxidation of impurities of scrap emitted as part of a recycling process
Thermal decomposition of carbonates, excluding those for the flue gas scrubbing	Production of magnesia.
Chemical synthesis where the carbon bearing material participates in the reaction, for a primary purpose other than the generation of heat	Acrylic acid production, acetylene production (partial oxidation), acrylonitrile production (ammoxidation), formaldehyde production (partial oxidation/dehydrogenation) and melamine production (urea derivative)
Use of carbon containing additives or raw materials for a primary purpose other than the generation of heat	Emissions from the oxidation of organic additives to increase the porosity of ceramics products
Chemical or electrolytic reduction of metalloid oxides or non-metal oxides such as silicon oxides and phosphates	Production of silicon, reduction of phosphate ore

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Chemical synthesis where the carbon bearing material participates in the reaction to give the product its characteristic composition or properties or serves a purpose other than the generation of heat	Acrylic acid production, acetylene production (thermal oxidation), acrylonitrile production (ammoxidation), formaldehyde production (partial oxidation/dehydrogenation) and melamine production (urea derivative)
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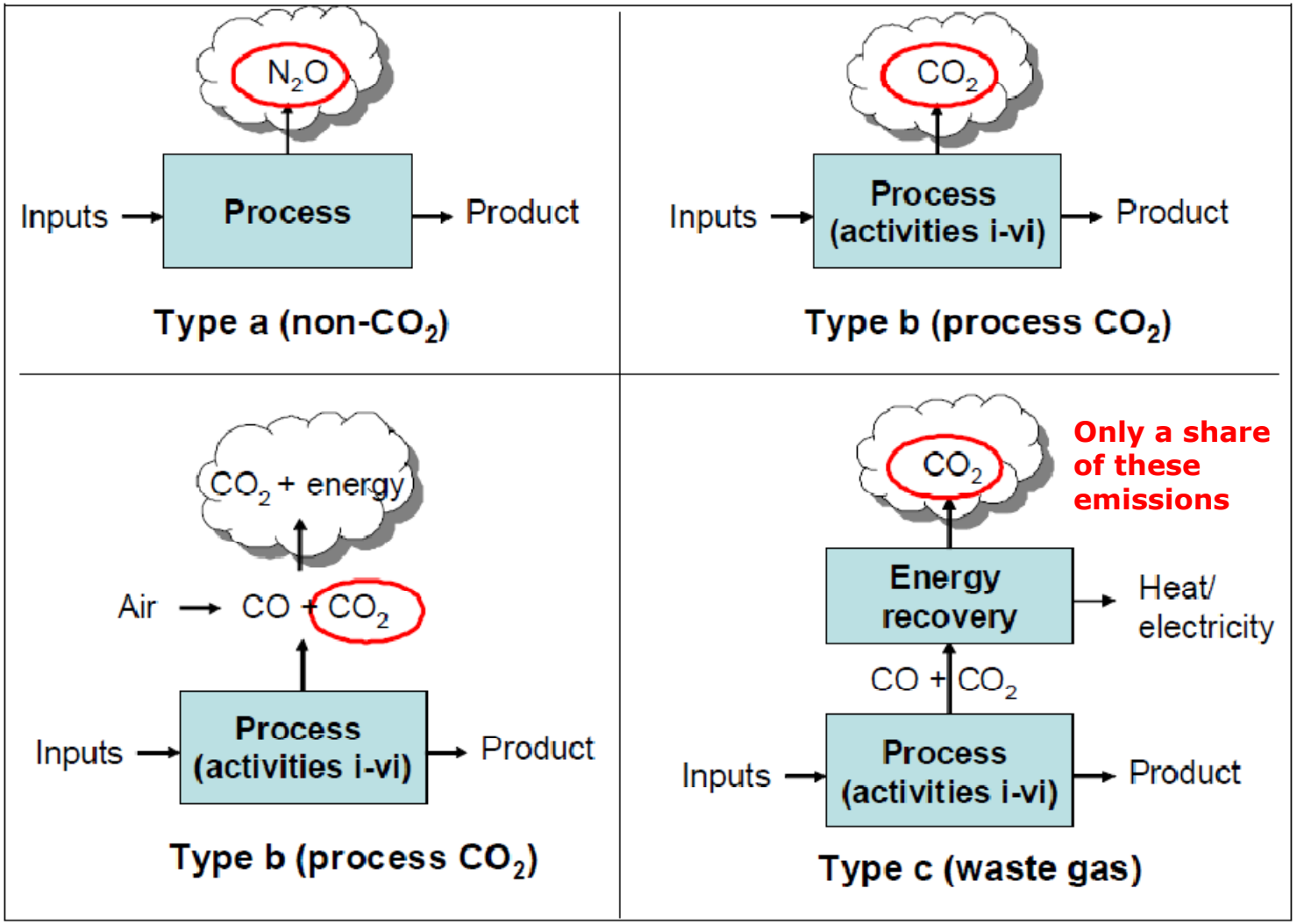
Chemical or electrolytic reduction of metalloid oxides or non-metal oxides such as silicon oxides and phosphates	Production of silicium, reduction of phosphate ore

Process emissions

≠

process emissions as defined in MRGs

Process emissions sub-installations cover



Stepwise approach to determine allocation

1. a) Define sub-installations and
   b) attribute relevant inputs /outputs
2. Determine historical activity level per sub-installation
3. Determine preliminary allocation
4. Determine total final allocation (not part of NIMs)

Unit of historical activity level

Sub-installations have different units of activity:

- Product benchmarks -> Unit of production (e.g. tonne)
- Heat benchmark -> TJ heat consumption
- Fuel benchmark -> TJ fuel consumption
- Process emissions -> tCO_2 process emissions

But the way to determine the historical activity level is the same for all.

Basic way to determine the historical activity level for each sub-installation

- The operator selects the baseline period *for the complete installation*:
  - 2005 – 2008 OR 2009 – 2010

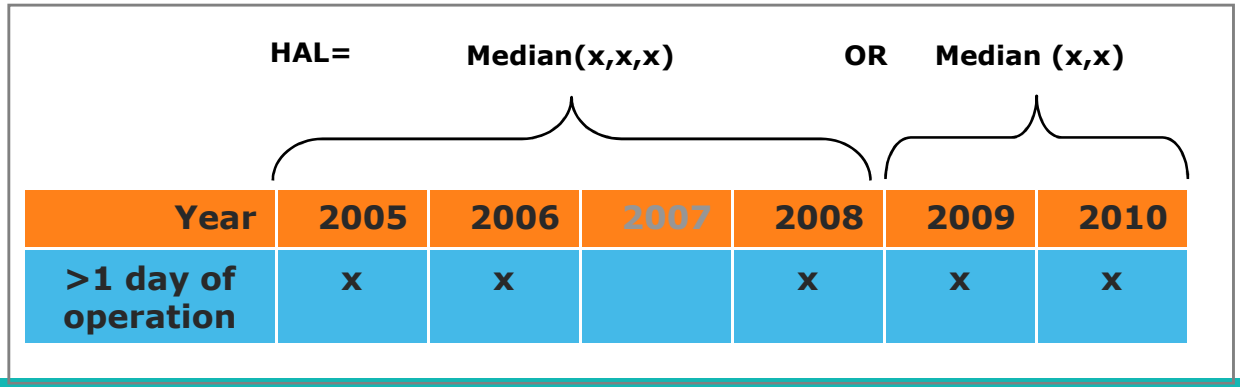
Median (1,2,5)=2

Median (0,2,4,10) = 3

$$HAL = median_{baseline}(\text{annual activity levels})$$

- Skip years in which the installation has not operated at least one day. *Note: this rule is not applicable for installations that by their nature operate only occasionally (e.g. installation kept in reserve or stand-by)*

Example: interrupted operation from 5 December 2006 to 2 January 2008



Year	2005	2006	2007	2008	2009	2010
>1 day of operation	x	x		x	x	x

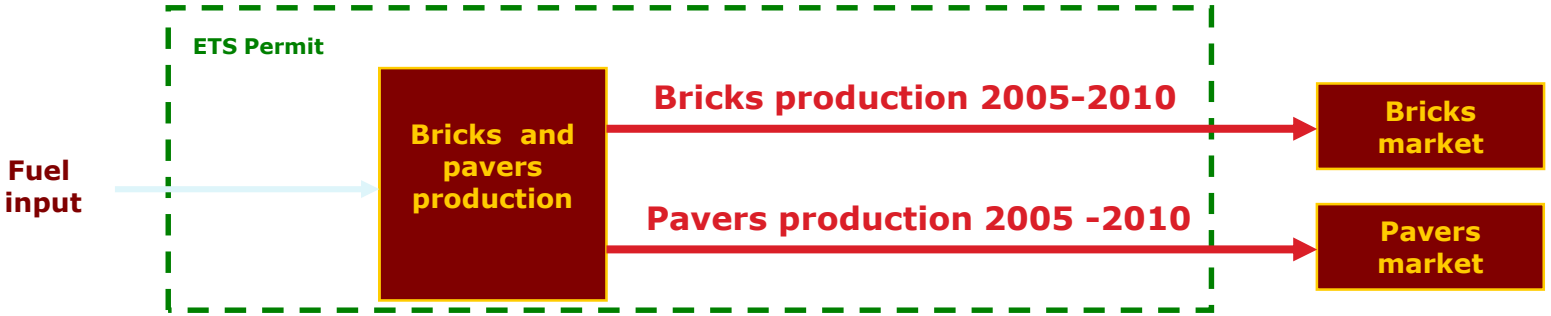
Example - Bricks and pavers production

- The chosen baseline is 2009-2010

	2005	2006	2007	2008	2009	2010
Bricks	4000	5000	2000	2000	**4000**	**6000**
HAL = median$_{2009\text{-}2010}$(4000,6000) =						**5000**

The rules apply to the entire installation, including all sub-installations

- The chosen baseline in is 2009-2010

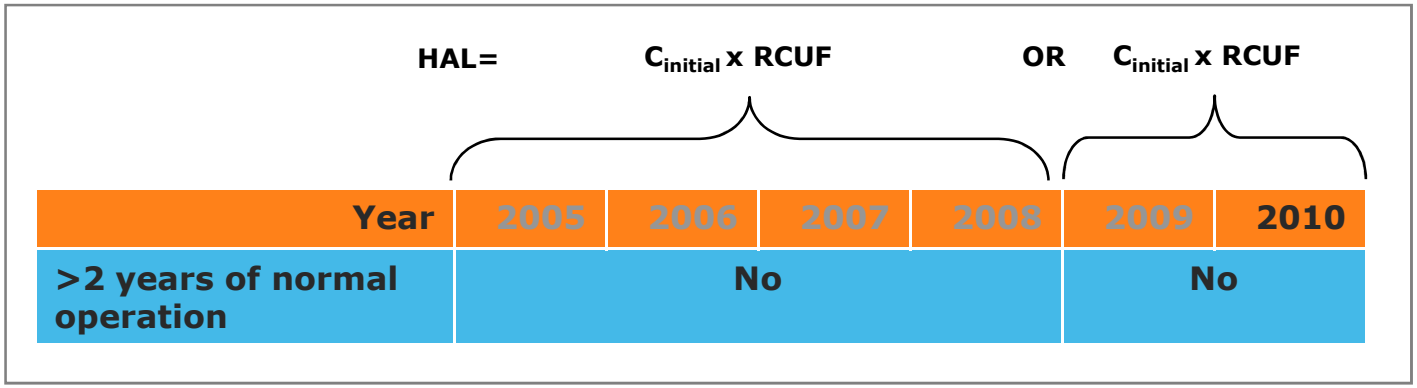


	2005	2006	2007	2008	2009	2010
Bricks sub-installation	7000	6500	6000	8000	**10000**	**13000**
Pavers sub-installation	1000	1500	1700	2000	**1500**	**1500**
HAL bricks = median$_{2009\text{-}2010}$(10000, 13000) =						**11500**
HAL pavers = median$_{2009\text{-}2010}$(1500, 1500) =						**1500**

Alternative approach for sub-installations that are part of an installation that started operation within the baseline period such that there are no two full calendar years of operation in the chosen baseline period.

HAL = Initial capacity x Relevant Capacity Utilisation Factor

Example: start of operation: 6 May 2009



- Note: for installations that by their nature operate only occasionally (e.g. installation kept in reserve or stand-by), the start of operation meant, is the first time that the installation operated.
- So if such an installation operated in 2004, stopped operation from 2005 to 2007, then the start of operation would not be in 2007.

The relevant capacity utilisation factor will be estimated by the operator and independently verified but eventually set by the CA

Based on:

- The installations intended normal operation
- The maintenance cycle
- Common production cycle
- Energy efficient techniques (for fuel and heat benchmark sub-installations)
- Greenhouse Gas efficient techniques (for process emissions sub-installations)

Data quality requirements:

- Plausibility: Should be checked against typical utilisation rates in the sector concerned
- Values > 100% should not be accepted
- Should be independently verified

More examples..

Start of operation on 3 March 2007

HAL= $C_{initial}$ x RCUF OR Median (x,x)

Year	2005	2006	2007	2008	2009	2010
>1 day of operation			x	x	x	x
>2 years of normal operation	No				Yes	

Start of operation on 3 March 2006

HAL= Median (x,x,x) OR Median (x,x)

Year	2005	2006	2007	2008	2009	2010
>1 day of operation		x	x	x	x	x
>2 years of normal operation	Yes				Yes	

The rules apply to the entire installation

Example: a paper mill consisting of two product benchmark sub-installations: coated and uncoated fine paper

Year	2005	2006	2007	2008	2009	2010
Activity level (Adt/year)						
Uncoated fine paper product benchmark sub-installation	400	450	0	500	800	700
Coated fine paper product benchmark sub-installation	0	600	1000	500	0	100
HAL						
Uncoated fine paper product benchmark sub-installation	Median (400,450,0,500) = 425				Median (800,700) = 750	
Coated fine paper product benchmark sub-installation	Median (0,600,1000,500) = 550				Median (0,50) = 25	

- Even though a sub-installation interrupted activity and had <2 years normal operation in 2009 and 10, the installation as a whole did not.
- There is one baseline period for the entire installation (either 2005 – 2008 OR 2009-2010)

This table gives an overview of possible situations

	Year	'05	'06	'07	'08		'09	'10
At least one day of operation in each year	HAL = median	x	x	x	x	OR median	x	x
No operation in 2006	HAL = median	x		x	x	OR median	x	x
Operation started on 1 January 2007 or before	HAL = median			x	x	OR median	x	x
Operation started between 2 Jan. '07 and 1 Jan. '09	HAL = Initial capacity x RCUF					OR median	x	x
Operation started on 2 January 2009 or later	HAL = Initial capacity x RCUF							

* 1st day of operation is included in the baseline period

In case of significant capacity changes..

$$HAL = HAL_{initial} + HAL_{change}$$

$HAL_{initial}$ = HAL related to capacity before change

HAL_{change} = HAL related to changed capacity

- What is a significant change in capacity?
- How to determine capacity?
- How to determine $HAL_{initial}$ and HAL_{change}?

Capacity

- Capacity is needed for
  - Product benchmark sub-installations (for determination of SCUF)
  - Sub-installations of on installation that operated <2 years in the baseline period
  - Sub-installation before and after a significant capacity change

- **There are two ways to determine capacity:**

Average of 2 highest monthly production volumes in a period x 12 months per year

OR

Experimental verification (48 hours continuous test)

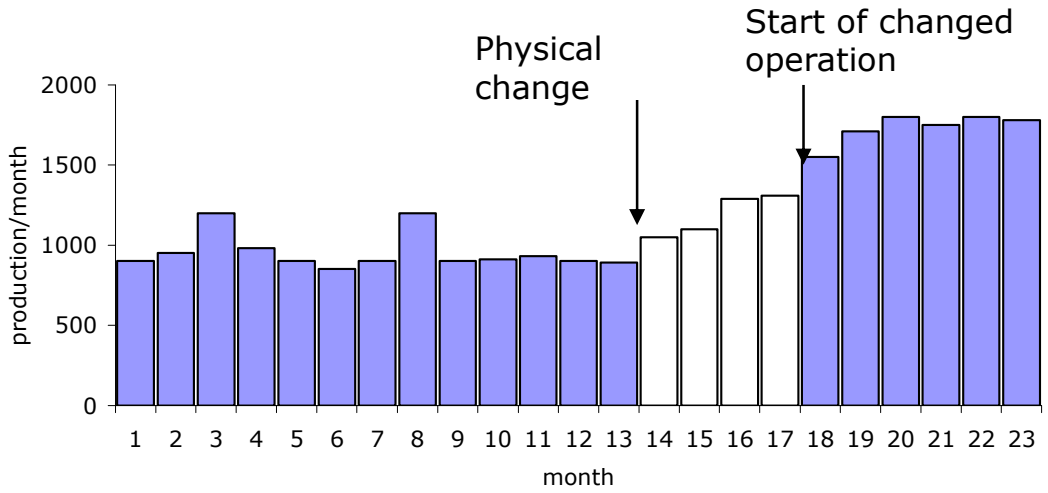
Overview of when to use what method

	Avg. of highest monthly production volumes in period	Exp. verification
Initial capacity of product benchmark sub-installations to determine SCUF	2005 – 2008 (or until significant capacity change), based on at least 6 months	Never
Initial capacity of sub-installations of on installation that operated <2 years in the baseline period	Start of operation – June 2011 (or until significant capacity change) based on at least 6 months, Period can be extended to 30 Sep. 2011 if needed to obtain 6 months	If other approach is not possible
Capacity of sub-installation before a significant capacity change	2005 (or after last capacity change) – Start of changed operation based on at least six months	If other approach is not possible
Capacity of sub-installation after a significant capacity change	Six months after start of changed operation	Never

The start of (changed) operation should be determined following a stepwise appoach

1. Determine added design capacity (extensions) or remaining design capacity (reductions)
2. From physical change onwards: monitor activity level related to added or remaining design capacity
3. Start of changed operation is the first day of a 90 day consecutive period in which this activity level on average is >40% of added or remaining design capacity;

   The usual production cycle of the sector concerned may not foresee continuous production. In that case the 90 day period should be split in production cycles

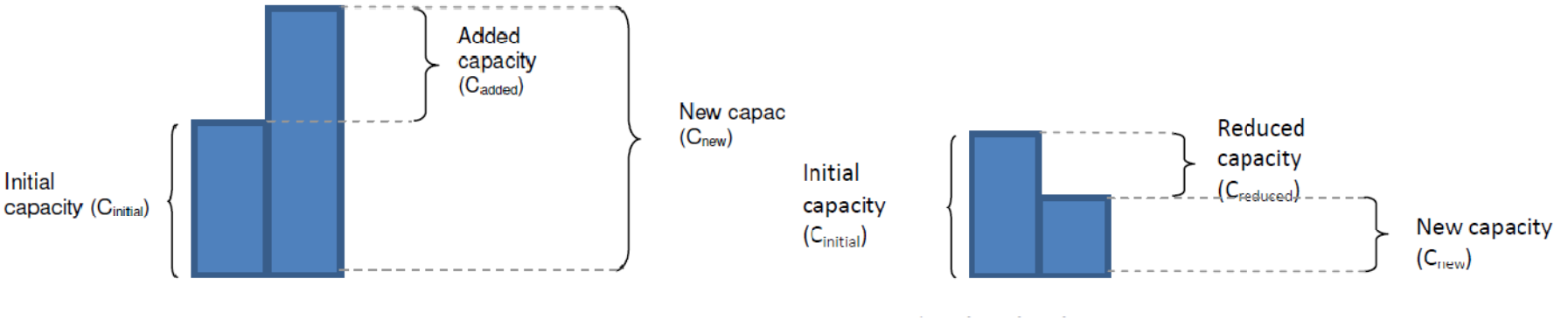


A significant capacity change is a change in the period 1-1-’05 and 30-6-’11 consisting of:

A. Physical change at the installation concerned AND changed capacity at least 10% of initial capacity

OR

B. Physical change at the installation concerned AND a changed activity level that would lead to a change in allocation of at least 50 000 allowances per year representing at least 5% of original allocation



Relation between the physical change and the capacity change

- There should be a causal relation between physical changes and capacity changes
- A physical change can only lead to one capacity change per sub-installation
- Measures that exclusively aim at increasing efficiency and not increasing output should not be regarded as physical changes.
- Only significant capacity changes which have been identified before 30 September 2011 should be considered (so with a start of changed operation before 30 March).
- Physical change *in* baseline period could lead to significant capacity change *after* the baseline period.

The historical activity level in case of significant capacity changes is

$$HAL = HAL_{initial} + HAL_{change}$$

$HAL_{initial}$ = HAL related to capacity before change

- HAL determined as before: $Median_{baseline}$ (annual activity levels)
- BUT, activity levels:
  - For capacity extensions: Activity level related to added capacity:
    - Based on actual activity level of extension
    - In case not feasible;

$$AL_{initial} = AL_{Total} \cdot \frac{C_{initial} \times (d_{prior\ change} + d_{after\ change})}{C_{initial} \times d_{prior\ change} + C_{added} \times d_{after\ change}}$$

AL = Annual activity level

C_i = Capacity

d = days in year

  - For capacity reductions: Activity level related to remaining capacity

The historical activity level in case of significant capacity changes is

$$HAL = HAL_{initial} + HAL_{change}$$

HAL_{change} = HAL related to changed capacity

- Determined as follows:

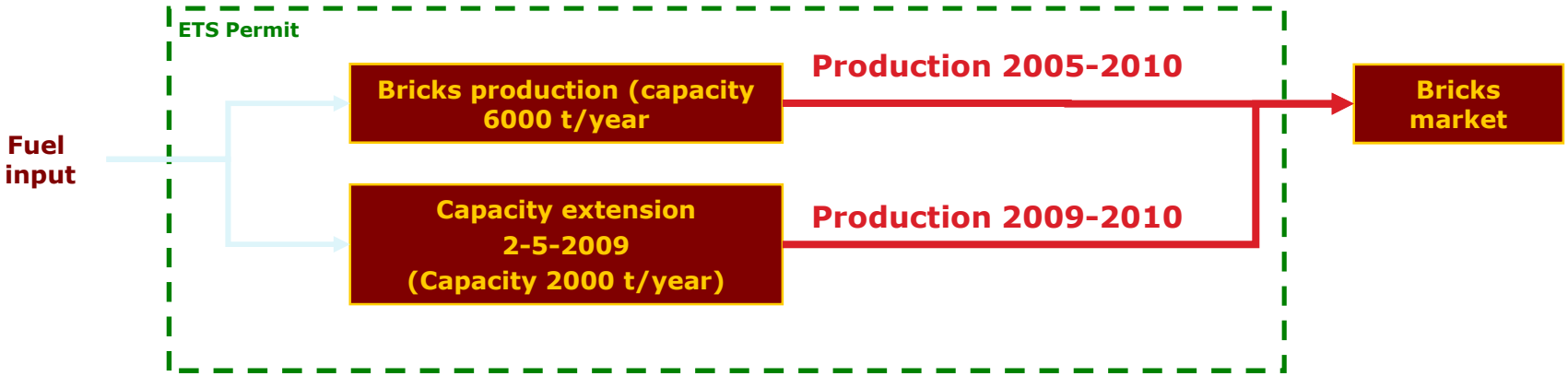
$$\mathbf{HAL_{change} = Changed\ capacity \times HCUF}$$

- HCUF = Historical Capacity Utilisation Factor

HCUF = (average annual activity level in calendar years before change)/Initial capacity

- If change is in 2005, then HCUF is based on monthly data.
- HCUF is only determined once before a first capacity change

Case Study - Bricks and pavers production



	2005	2006	2007	2008	2009	2010
Production related to initial capacity	4000	5000	2000	2000	**5500**	**4500**

$HAL_{initial}$= $median_{2009-2010}$ (5500,4500) =	**5000**
HAL_{added}= C_{added} x HCUF = 2000 x 0.54 = With HCUF = (average production in years before changes /initial capacity (4000+5000+2000+2000)/4)/ 6000 = 0.54	**1083**
HAL_{total} = $HAL_{initial}$ + HAL_{added}	**6083**

Stepwise approach to determine allocation

1. a) Define sub-installations and
   b) attribute relevant inputs /outputs
2. Determine historical activity level per sub-installation
3. Determine preliminary allocation
4. Determine total final allocation (not part of NIMs)

Determine preliminary total allocation

Not considering carbon leakage (CL) status

The allocation without considering CL-status is the same for each year

The allocation without considering CL-status is needed for the Commission to determine the need for a **cross-sectoral correction factor**

Product benchmark sub-installations: (a correction applies for consumption of heat from non-ETS sources or nitric acid sub-installations)	BM_P *[EAU/t product]* x HAL_P *[t product]** - BM_H [EAU/TJ heat] x $HAL_{Non\ eligible\ heat}$ [TJ heat]
Heat benchmark sub-installations:	BM_H *[EAU/TJ heat]* x HAL_H *[TJ heat]*
Fuel benchmark sub-installations:	BM_F *[EAU/TJ fuel]* x HAL_F *[TJ fuel]*
Process emissions sub-installations:	0.97 *[EAU/tCO_2]* x HAL_E *[tCO_2]*
Preliminary total allocation: ***(not considering CL-status)***	**Sum for all sub-installations**

BM: Benchmark
HAL: Historical activity level
EAU: Allowances

* In specific cases (listed in the CIMs) the allocation to a product benchmark sub-installation is corrected e.g. for exchangeability of fuel and electricity, see next slides and Guidance Doc. 9

Determine preliminary total allocation
Considering carbon leakage status

The allocation with consideration of CL-status can differ from year to year

The CL-status may change in the future

Product benchmark sub-installations: (a correction applies for consumption of heat from non-ETS sources or nitric acid sub-installations)	(BM_P *[EAU/t product]* x HAL_P *[t product]** - BM_H [EAU/TJ heat] x $HAL_{non\text{-}eligible\ Heat}$ [TJ heat]) x CLEF
Heat benchmark sub-installations:	BM_H *[EAU/TJ heat]* x HAL_H *[TJ heat]* x CLEF
Fuel benchmark sub-installations:	BM_F *[EAU/TJ fuel]* x HAL_F *[TJ fuel]* x CLEF
Process emissions sub-installations:	0.97 [EAU/tCO2] x HAL_E [tCO2] x CLEF
Preliminary total allocation: ***(considering CL-status)***	**Sum for all sub-installations**

BM: Benchmark
HAL: Historical activity level
EAU: Allowances
CLEF: Carbon leakage exposure factor

Stepwise approach to determine allocation

1. a) Define sub-installations and
   b) attribute relevant inputs /outputs
2. Determine historical activity level per sub-installation
3. Determine preliminary allocation
4. Determine total final allocation (not part of NIMs)

Determine final total allocation (not in NIMs)

Cross-sectoral correction for installations that are not "electricity generators" (pursuant to Art 3(u)):

Final allocation = $F_{instal,prel.}$ (k) x CSF (k)

$F_{instal,prel.}$(k): Preliminary allocation considering CL-status in year k
CSF (k): Cross-sectoral correction factor in year k

Linear reduction for "Electricity generators" (pursuant to Art 3(u)):

Final allocation = $F_{instal.prel}$(k) – 0.0174 x $F_{instal.prel}$(2013) x (k – 2013)

$F_{instal,prel.}$(k): Preliminary allocation considering CL-status in year k
0.0174 Linear reduction factor

Note: electricity generators do not receive allocation for electricity generation, but could receive allocation for other activities.