German Environment Agency

30. May 2023

Introduction of a Carbon Border Adjustment Mechanism (CBAM) in the EU

Overview of the functioning of CBAM

The CBAM will be introduced on the 1 October 2023 according to Regulation (EU) 2023/956[1]. The aim is to address the risk of carbon leakage if differences in levels of ambition worldwide persist as the EU accelerates its reduction targets. The purpose of the CBAM is to therefore ensure the same carbon price will be paid for the GHG emissions associated with certain imported goods as in the European Emissions Trading System (EU ETS). This factsheet provides an overview of the key design features of the CBAM and how it is expected to function.

The most important elements of CBAM at a glance

- The main idea of the CBAM is to apply the same carbon price to imported emission-intensive goods as if they had been produced under the European Emissions Trading System (EU ETS). Thereby, the CBAM aims at strengthening climate action by broadening the carbon price signal and at the same time preventing the risk of carbon leakage. It also aims at encouraging industry outside the EU and its international partners to reduce emissions, and to contribute to enhanced climate policy ambition more broadly.
- The CBAM seeks to replace current measures against carbon leakage in the EU: free allocation of EU allowances (EUAs) in the EU ETS and – in the future – the financial compensation for indirect EU ETS costs in electricity prices.
- The CBAM applies to direct embedded GHG emissions associated with certain imported goods (basic materials and basic material products) such as cement, electricity, fertilisers, hydrogen, iron and steel and aluminium sectors. Indirect emissions will also be covered by the CBAM for the electricity, cement and fertiliser sectors.
- The CBAM is proposed to start with a transitional period without financial obligations and with simplified reporting requirements between October 2023 and the end of 2025. From 2026 on, importers are required to purchase and surrender CBAM certificates corresponding to the embedded emissions in imported goods. The CBAM price is based on average EUA auction prices from the previous week. The CBAM surrendering obligation is phased in at the same pace as free allocation to EU producers of those goods is reduced. By 2034 free allocation is phased out completely for these products and the CBAM obligation applies to 100% of embedded emissions.
- Imports from countries linked to the EU ETS are excluded. Further countries could be excluded in case agreements ensure a higher degree of effectiveness and ambition to achieve decarbonisation of a sector.

[1] Official Journal of the EU (L 130), 16th May 2023 (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2023:130:FULL)

- Some important design aspects will be clarified in subsequent implementing acts (e.g. on the detailed methods for reporting and calculating the surrendering obligation).

1 Key elements of the CBAM

1.1 Objective

The objective of the CBAM is to prevent the risk of carbon leakage, i.e. the shifting of industrial production, investments and resulting emissions to jurisdictions with lower or no carbon prices. The CBAM is thus intended to strengthen climate action, in particular the EU ETS. It may also encourage the climate actions of third countries and the use of more emissions-efficient technologies by producers. From 2026 onwards, the CBAM will progressively become an alternative to current measures against carbon leakage.

1.2 Scope

The CBAM shall apply to certain direct GHG emissions for products defined under the Combined Nomenclature (CN) classification for the electricity, cement, iron and steel, fertilisers, hydrogen and aluminium sectors that are listed in Annex I of the CBAM regulation (see Table 2 of this factsheet). It covers CO_2 emissions as well as N_2O from the production of certain chemicals and PFC emissions from the production of aluminium. Certain downstream products are also included within the scope of the CBAM (i.e. such as screws), despite their low level of direct emissions during the last manufacturing step, as 'their exclusion would increase the likelihood of circumventing the inclusion of steel products in the CBAM by modifying the pattern of trade towards downstream products' (recital 38). Indirect emissions will also be covered by the CBAM for the electricity, cement and fertiliser sectors (Annex II of the CBAM regulation). The EU Commission will evaluate before 2026 whether to further expand the scope of covered goods under the CBAM. For example, to include organic chemicals and polymers and to expand the coverage of indirect emissions to include the iron and steel, aluminium, and hydrogen sectors.

The CBAM regulation also has provisions for the inward processing procedure that gives businesses the possibility to process goods imported from outside the customs territory of the EU without any import duties even before they decide, according to logistical, commercial or other conditions, whether to sell the finished products within the EU or outside. Processed products from CBAM goods resulting from the inward processing procedure are also covered by the CBAM regulation even if the processed products are not listed in Annex I of the CBAM Regulation (Article 2(1), Article 34(1)).

Countries covered by or linked to EU ETS are excluded from the application of CBAM. Agreements with third countries could be considered as an alternative to CBAM if 'the carbon price paid in the country in which the goods originate is effectively charged on the greenhouse gas emissions embedded in those goods without any rebates beyond those also applied in accordance with the EU ETS' (Article 2(6)).

1.3 Transitional period

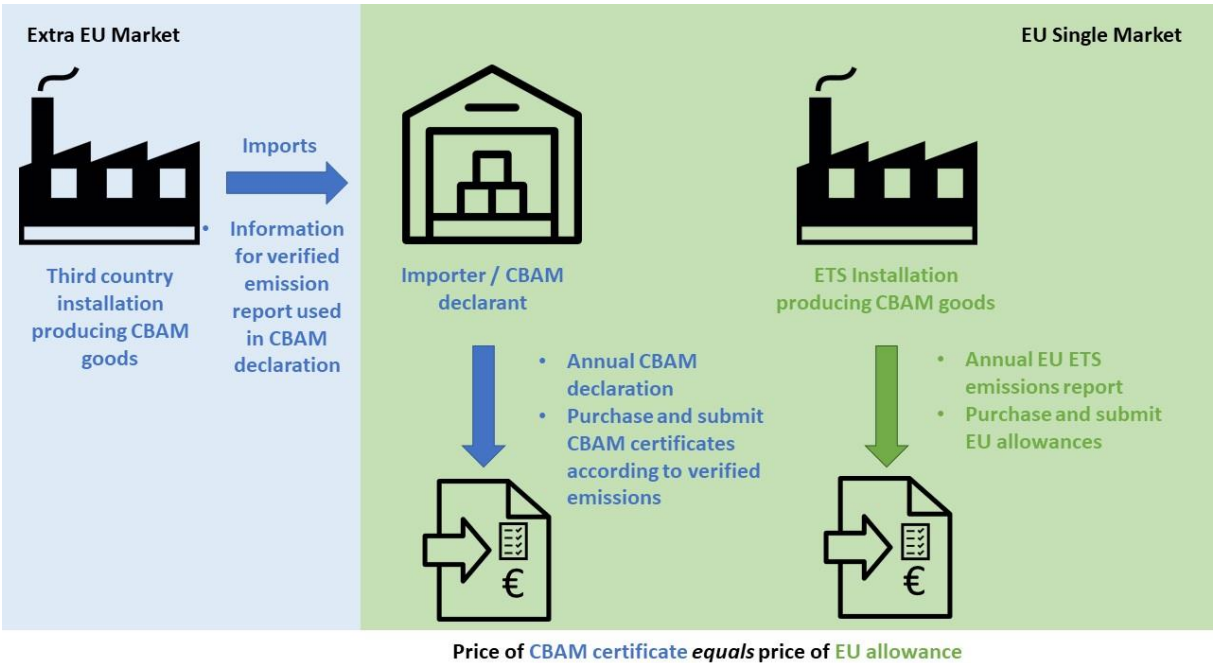
In order to allow businesses to adjust to the CBAM it is proposed to initially start with a transitional period without obligations to surrender certificates from the 1st of October 2023 until the end of 2025. During this time period, importers will be required to submit a CBAM report each quarter of a calendar year to the EU Commission. The CBAM report shall include information on the goods imported in terms of volume, embedded direct and indirect emissions and the carbon price due in a country of origin for the embedded emissions in the imported goods, which is not subject to a rebate or other form of compensation on exportation. There will be simplified rules for calculating embedded emissions and no verification is necessary, but incomplete or incorrect reports might be subject to a correction procedure. Before the end of the transitional period, the EU Commission will collect the information necessary to extend the

CBAM to other goods than those initially listed (refer to Table 2 in the Annex) and to further develop methods to calculate embedded emissions.

1.4 How the CBAM works from 2026

The fundamental element of the proposed CBAM is that importers of certain goods (or their indirect customs representatives) will be required to surrender a number of CBAM certificates corresponding to their total embedded emissions considering a potential carbon price paid abroad and free allocation in the EU. Only authorised CBAM declarants may import CBAM goods into the EU from 1 January 2026 on. A simplified overview of how the CBAM is expected to function is illustrated below in Figure 1.

Figure 1 Overview of the implementation of the CBAM



Source: Own illustration

Importers will need an authorisation as CBAM declarant for importing CBAM goods into the EU. The EU Commission will set up a CBAM registry accessible automatically and in real time to customs authorities and competent authorities from Member States. Through the CBAM registry, CBAM certificates will be surrendered by the authorised CBAM declarant based upon their CBAM declaration submitted by the 31st of May each year, for the calendar year preceding the declaration. The CBAM declaration shall include the following information (Article 6):

- The total quantity of each type of goods imported during the preceding calendar year, expressed in megawatt hours for electricity and in tonnes for other goods.
- The total embedded emissions, in those goods, expressed in tonnes of CO_2e emissions per megawatt-hour of electricity or, for other goods, in tonnes of CO_2e emissions per tonne of each type of goods.
- The total number of CBAM certificates corresponding to the total embedded emissions, to be surrendered, after the reduction due on the account of the carbon price paid in a country of

origin and the adjustment necessary to reflect the extent to which EU ETS allowances are allocated free of charge.

- Copies of verification reports issued by accredited verifiers.

CBAM certificates will be sold to authorised declarants at the price of an EU ETS allowance via a common central platform that shall be established and managed by the EU Commission. However, an authorised declarant can request before the 30th of June each year, for the EU Commission on behalf of the relevant competent authority to re-purchase the excess of CBAM certificates remaining on the account of that authorised declarant but only up to one third of the total CBAM certificates purchased by the declarant during the previous calendar year. Furthermore, the re-purchase price for each CBAM certificate shall be the price paid by the authorised declarant for that certificate at the time of purchase. Any CBAM certificates that were purchased during the year before the previous calendar year that remain on the accounts in the CBAM registry of the authorised declarants will then be cancelled by the EU Commission by the 30th of June of each year without any compensation.

The price of CBAM certificates will be determined by the EU Commission, based upon the average price of the closing prices of EU ETS allowances on the common auction platform for each calendar week.

1.5 Calculating the CBAM obligation

The surrendering obligation is calculated as follows:

Surrendering obligation = Embedded emissions – reduction for carbon price paid abroad – adjustment to reflect free allocation within the EU.

The three elements are described below.

1.5.1 Determining embedded emissions

Embedded emissions in goods other than electricity shall be determined based on the actual emissions distinguishing in Annex IV of the CBAM regulation between 'simple goods' (i.e. refers to goods produced in a production process requiring exclusively input materials and fuels having zero embedded emissions) and 'complex goods' (i.e. refers to all goods other than simple goods).

1.5.1.1 Simple goods

For determining the specific actual embedded emissions of simple goods produced in a given installation, direct and, where applicable, indirect emissions shall be accounted for based on the following equation:

Specific embedded emissions of the good (in terms of CO_2e per tonne) = Attributed emissions of the good / Activity level of the good

The attributed emissions refer to the part of the installation's emissions during the reporting period that are caused by the production process (within the system boundaries that will be defined in subsequent implementing acts pursuant to Article 7(7)). The activity level refers to the amount of goods produced during the reporting period in that installation.

1.5.1.2 Complex goods

For determining the specific actual embedded emissions of complex goods produced in a given installation, the following equation is to be applied:

Specific embedded emissions of goods (in terms of CO_2e per tonne) = (Attributed emissions of the good + embedded emissions of the input materials (precursors) consumed in the production process) / Activity level of the good

In addition to the previous calculation, a complex good also takes into consideration the embedded emissions of input materials consumed in the production process. Only materials listed as relevant to the system boundaries (that will be defined in subsequent implementing acts pursuant to Article 7 (7)) of the production process are to be considered.

Default values will be used to determine embedded emissions in goods other than electricity when actual emissions cannot be adequately determined. These values 'shall be set at the average emission intensity of each exporting country and for each of the goods listed in Annex I other than electricity, increased by a proportionately designed mark-up' (see Annex IV, 4.1 of the CBAM regulation), the latter to be subsequently determined via an implementing act. If reliable data for the exporting country cannot be applied for a type of goods, the default values shall be instead based on 'the average emission intensity of the X per cent worst performing EU installations for that type of goods.' The value of X shall be subsequently determined via an implementation act.

Embedded emissions in imported electricity shall be determined based on specific default values that shall be set at the CO_2 emission factor in the third country, group of third countries or region within a third country, based on the best data available to the EU Commission. If those values are not available, the alternative default value for electricity shall be set at the CO_2 emission factor in the EU. The authorised declarant may also choose to determine the embedded emissions based on the actual emissions under particular circumstances.

1.5.2 Adjustment to reflect free allocation in the EU ETS

The CBAM certificates to be surrendered shall be adjusted to reflect the extent to which EU ETS allowances are allocated free of charge under EU ETS (Article 31). A higher free allocation in the EU ETS therefore lowers the CBAM obligation for importers, a lower free allocation leads to a higher CBAM obligation. The allocation of free allowances will be phased out gradually in order to allow economic operators to adjust. The reduction of free allocation will be implemented by applying a declining factor over time for installations producing CBAM goods (refer to Table 1).

Table 1 The phasing out of free allocation for CBAM goods

	2026	2027	2028	2029	2030	2031	2032	2033	2034
CBAM factor	97.5 %	95 %	90 %	77.5 %	51.5 %	39 %	26.5 %	14 %	0 %

Source: Article 10a (3) of Directive (EU) 2023/959, Official Journal of the EU 16th May 2023

Free allocation for the production of goods covered by the CBAM will be phased out from the start of the full implementation period in 2026 up until 2034.

1.5.3 Crediting of CO_2 prices paid abroad

Article 9 of the CBAM regulation includes a provision to credit CO_2 prices paid abroad by the authorised declarant. Indeed, the number of CBAM certificates that are required to be surrendered by the authorised declarant may be reduced if the declarant can provide in its CBAM declaration sufficient evidence showing that the declared emissions are already subject to a carbon price in the country of origin of the good and that the associated carbon cost has been paid in the country of origin and cannot be subject to an export rebate or other form of compensation linked to the fact that the good is exported. The EU Commission is empowered to

adopt implementing acts on the crediting of prices paid abroad including reporting requirements and further details such as the conversion rate of foreign currency to Euro.

2 Outlook

The final set of rules for applying the CBAM will be further specified in implementing acts to be adopted by the CBAM Committee, made up of representatives from EU Member States. There will also be two review reports before the end of the transitional period, one due already by the end of 2024 (Article 30(3)), the second one by the end of 2025 (Article 30(2)). Some of the aspects that need to be addressed in the short and medium term are outlined below.

Aspects that need to be addressed in the short and medium term:

- **Setting of detailed rules for implementation:** The administrative tasks in the implementation of CBAM will be shared between the EU Commission, the customs authorities and the national competent authorities. In setting the detailed implementation rules, it is important to keep administrative complexity at a minimum and to ensure that administrative burdens on the importers concerned as well as national administrations remain manageable. Implementing acts will regulate, for example, the following aspects:
  - The standard format and the procedure for submitting the CBAM declaration;
  - The calculation of embedded emissions (see subsequent paragraph);
  - The information and documents needed to demonstrate that the declared embedded emissions were subject to a carbon price in the country of origin of the goods;
  - The methodology to calculate the adjustment to account for free allocation;
  - The sale and re-purchase of CBAM certificates;
  - The process for applying and granting an authorisation;
  - The application of verification principles;
  - The accreditation of verifiers;
  - Rules applicable in the transitional period.
- **Introduction of monitoring, reporting and verification (MRV) systems for embedded emissions in imported CBAM goods:** The detailed rules for the calculation of embedded emissions have yet to be fully resolved including determining system boundaries of production processes and relevant precursor materials, emission factors, installation-specific values of actual emissions and default values. Determining default values for simple and complex goods will require further agreement on the mark up value to apply to the average emission intensity of imported goods from third countries and, if such data is not reliably available, then what alternative default value to use based on a certain percentage of the worst performing EU installations still needs to be agreed upon. Moreover, importers and their suppliers have to develop processes and business relations for reporting and verifying actual embedded emissions of imported CBAM goods. Simplified methods and flexibilities will apply in the transitional period.

- **International cooperation and possible WTO disputes:** The EU Commission considers CBAM to be fully compatible with WTO principles. However, trading partners could potentially challenge CBAM before WTO bodies. Time will show how foreign trading partners will react to EU's CBAM initiative. It also remains to be seen how CBAM will be integrated into other international initiatives such as a climate club. The EU Commission and Member States need to engage proactively with trading partners on a political and technical level in order to raise awareness for CBAM, offer guidance on MRV-aspects and assist partner countries in building capacities and decarbonising their emission-intensive industries. The EU has also yet to decide on how exactly to use the CBAM revenues. This aspect could play an important role for the international perception of CBAM as a climate protection instrument.

- **Extension of the scope:** Based upon a review of the data collected during the transition phase a decision will be taken before 2026 on whether to extend the scope to other goods at risk of carbon leakage. Already by 2024, the EU Commission will present a report that identifies products further down the value chain that could be included in the scope of CBAM. By 2025, the EU Commission shall assess the possibility to include indirect emissions embedded in goods listed in Annex II. For these goods, CBAM would replace the compensation for indirect carbon cost. Would CBAM provide an adequate protection against the risk of carbon leakage? The introduction of the CBAM may provide an incentive for non-EU producers to re-route goods produced with low-carbon electricity to the EU and goods produced with high-carbon electricity to alternative markets. Such a 'resource-shuffling' would not necessarily lead to a decline of global emissions. Furthermore, the EU Commission will assess to extend the scope to other goods at risk of carbon leakage, for instance organic chemicals and polymers with the aspiration to include all goods covered by the EU ETS by 2030. However, there are some technical limitations in defining the embedded emissions of goods in these more complex sectors that would need to be overcome.

- **Protection of EU exports:** As free allocation is gradually being replaced by the CBAM, which only offers protection against carbon leakage within the EU borders, competitive disadvantages may arise for export-oriented companies. The EU Commission will assess the impact of CBAM on exports in a report by the end of 2024 and present a legislative proposal if it concludes that there is a risk of carbon leakage for goods exported to third countries.

- **Promoting innovation to support decarbonisation in industry:** On top of addressing carbon leakage risks, new provisions in the EU ETS directive aim at speeding up the decarbonisation of industry. The new EU ETS rules stipulate that those sectors covered by CBAM will also receive special attention for funding innovative low-carbon technologies via the Innovation Fund. The Innovation Fund supports investments into decarbonising relevant sectors, including the scaling-up of low- and zero-carbon processes and technologies.

- **Circumvention:** Refers to practices that change the pattern of trade in goods, for which there is insufficient due cause or economic justification other than avoiding obligations relating to the CBAM. For example, a potential means of circumvention could involve slightly modifying the goods concerned to make those goods fall under CN codes that are not listed in Annex I of the CBAM regulation, except where the modification alters their essential

characteristics. If there are sufficient reasons to believe that this practice is occurring in one or more Member States according to an established pattern as a result of an investigation by the EU Commission, then the EU Commission may adopt delegated acts in accordance with Article 28 to amend Annex I by adding the relevant slightly modified products for anti-circumvention purposes.

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"Scientific monitoring of the review of the market stability reserve"

A Annex

Table 2 provides an overview of sectors and products that will initially be covered by the CBAM according to Annex I of the CBAM regulation.

Table 2: Overview of the sectors and products initially covered by the CBAM

Sector	CN Code	Description	
Cement	*2507 00 80*	*Other kaolinic clays*	*CO_2*
	2523 10 00	*Cement clinkers*	*CO_2*
	2523 21 00	*White Portland cement, whether or not artificially coloured*	*CO_2*
	2523 29 00	*Other Portland cement*	*CO_2*
	2523 30 00	*Aluminous cement*	*CO_2*
	2523 90 00	*Other hydraulic cements*	*CO_2*
Electricity	*2716 00 00*	*Electrical energy*	*CO_2*
Fertilisers	*2808 00 00*	*Nitric acid; sulphonitric acids*	*CO_2, N_2O*
	2814	*Ammonia, anhydrous or in aqueous solution*	*CO_2*
	2834 21 00	*Nitrates of potassium*	*CO_2, N_2O*
	3102	*Mineral or chemical fertilisers, nitrogenous*	*CO_2, N_2O*
	3105	*Mineral or chemical fertilisers containing two or three of the fertilising elements nitrogen, phosphorus and potassium; other fertilisers; goods of this chapter in tablets or similar forms or in packages of a gross weight not exceeding 10 kg - Except: 3105 60 00 – Mineral or chemical fertilisers containing the two fertilising elements phosphorus and potassium*	*CO_2, N_2O*
Iron and steel	72	Iron and steel Except: 7202 2 – Ferro-silicon; 7202 30 00 – Ferro-silico-manganese; 7202 50 00 – Ferro-silico-chromium; 7202 70 00 – Ferro-molybdenum; 7202 80 00 – Ferro-tungsten and ferro-silico-tungsten; 7202 91 00 – Ferro-titanium and ferro-silico-titanium; 7202 92 00 – Ferro-vanadium; 7202 93 00 – Ferro-niobium; 7202 99 – Other: 7202 99 10 – Ferro-phosphorus; 7202 99 30 – Ferro-silico-magnesium; 7202 99 80 – Other; 7204 – Ferrous waste and scrap; remelting scrap ingots and steel	CO_2
	2601 12 00	Agglomerated iron ores and concentrates, other than roasted iron pyrites	CO_2
	7301	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; welded angles, shapes and sections, of iron or steel	CO_2

Sector	CN Code	Description	
	7302	Railway or tramway track construction material of iron or steel, the following: rails, check-rails and rack rails, switch blades, crossing frogs, point rods and other crossing pieces, sleepers (cross-ties), fish- plates, chairs, chair wedges, sole plates (base plates), rail clips, bedplates, ties and other material specialised for jointing or fixing rails	CO_2
	7303 00	Tubes, pipes and hollow profiles, of cast iron	CO_2
	7304	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel	CO_2
	7305	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406,4 mm, of iron or steel	CO_2
	7306	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	CO_2
	7307	Tube or pipe fittings (for example, couplings, elbows, sleeves), of iron or steel	CO_2
	7308	Structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge-sections, lockgates, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, shutters, balustrades, pillars and columns), of iron or steel; plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures, of iron or steel	CO_2
	7309 00	Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquefied gas), of iron or steel, of a capacity exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	CO_2
	7310	Tanks, casks, drums, cans, boxes and similar containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	CO_2
	7311 00	Containers for compressed or liquefied gas, of iron or steel	CO_2
	7318	Screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter pins, washers (including spring washers) and similar articles, of iron or steel	CO_2
	7326	Other articles of iron or steel	CO_2
Aluminium	7601	Unwrought aluminium	CO_2, PFCs
	7603	Aluminium powders and flakes	CO_2, PFCs
	7604	Aluminium bars, rods and profiles	CO_2, PFCs
	7605	Aluminium wire	CO_2, PFCs

Sector	CN Code	Description	
	7606	Aluminium plates, sheets and strip, of a thickness exceeding 0,2 mm	CO_2, PFCs
	7607	Aluminium foil (whether or not printed or backed with paper, paper-board, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0,2 mm	CO_2, PFCs
	7608	Aluminium tubes and pipes	CO_2, PFCs
	7609 00 00	Aluminium tube or pipe fittings (for example, couplings, elbows, sleeves)	CO_2, PFCs
	7610	Aluminium structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge-sections, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, balustrades, pillars and columns); aluminium plates, rods, profiles, tubes and the like, prepared for use in structures	CO_2, PFCs
	7611 00 00	Aluminium reservoirs, tanks, vats and similar containers, for any material (other than compressed or liquefied gas), of a capacity exceeding 300 litres, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment.	CO_2, PFCs
	7612	Aluminium casks, drums, cans, boxes and similar containers (including rigid or collapsible tubular containers), for any material (other than compressed or liquefied gas), of a capacity not exceeding 300 litres, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	CO_2, PFCs
	7613 00 00	Aluminium containers for compressed or liquefied gas	CO_2, PFCs
	7614	Stranded wire, cables, plaited bands and the like, of aluminium, not electrically insulated	CO_2, PFCs
	7616	Other articles of aluminium	CO_2, PFCs
Chemicals	2804 10 00	Hydrogen	CO_2

Note: The sectors formatted above in italics (i.e. cement, fertilisers and electricity) indicate that both direct and indirect embedded emissions are initially covered within the scope of the CBAM during the transitional period. For the other sectors, only direct emissions are initially covered.

Source: CBAM Regulation (EU)