The Carbon Border Adjustment Mechanism eLearning module

CBAM in the electricity sector

Course takeaways

This eLearning course on CBAM in the electricity sector offers a comprehensive exploration of the Carbon Border Adjustment Mechanism (CBAM) specifically within the context of the electricity industry.

By the end of this course, the learner will understand CBAM's general aspects, the criteria specific to the electricity sector, emissions measurement and reporting requirements, and the IT system. They will be well-equipped to navigate the challenges and opportunities presented by CBAM in the electricity industry and comply with the legal obligations.

This is a quick and handy summary of the most relevant module information:

1. Introduction

1.1 Did you know?

The Carbon Border Adjustment Mechanism (CBAM) is an instrument implemented by the European Union to address the risk of carbon leakage. The EU's ambition is to become climate neutral by 2050, and CBAM will aim to ensure that imported goods are subject to a carbon price equivalent to the carbon price of domestic production in the EU.

CBAM affects the electricity sector by putting a price on emissions associated with electricity produced in countries outside the EU and **imported into the EU**. It aims to encourage sustainable practices and reduce carbon footprint.

For electricity importers, compliance with CBAM initially involves reporting direct emissions associated with electricity production as imported good from third countries on a quarterly basis, relying on supplier information. However, from 1 January 2026, importers of electricity have to buy CBAM certificates for emissions in imported electricity, just like in the Emissions Trading System in the EU.

Nevertheless, these costs can be minimized by choosing suppliers who have implemented sustainable practices and reduced their carbon emissions.

Overall, CBAM provides an opportunity for the electricity sector to embrace sustainability and contribute to environmental protection by positioning businesses as socially responsible and environmentally conscious players in the market.

1.2 Learning objectives

This course is addressed to any person who operates or controls production installations in third countries, importers, indirect customs representatives (acting as reporting declarants), trade partners and competent authorities or anyone who needs to understand and work with CBAM obligations in the electricity sector.

At the end of this course, you will have achieved the following learning objectives:

- Understand the general aspects of CBAM and rules for reporting declarants.
- Understand the main criteria for CBAM in the electricity sector, including relevant emissions and the formula to calculate specific embedded emissions.
- Be able to calculate the formula for specific embedded emissions in the transitional period.
- Understand reporting requirements and how they are applied in the IT system (CBAM Transitional Registry).
- Demonstrate confidence and competence in the use of the CBAM Transitional Registry.

2 General aspects of CBAM

2.1 Overview

The European Union has adopted the Carbon Border Adjustment Mechanism (CBAM) to support the goal of achieving climate neutrality by 2050. CBAM will work alongside other measures in the 'Fit for 55' package and will reduce the risk of carbon leakage as the EU moves towards achieving its climate targets.

Carbon leakage

Carbon leakage occurs when companies move carbon-intensive production from the EU to countries where less stringent climate policies are in place than in the EU, or when EU products get replaced by more carbon-intensive imports. CBAM aims to gradually replace existing measures designed to prevent carbon leakage, particularly the allocation of free emission allowances under the EU Emissions Trading System (ETS). It seeks to establish an equivalent carbon price for both domestic and imported production of specific goods.

Sectors

CBAM will apply to the following sectors: aluminium, cement, electricity, fertilisers, hydrogen and iron and steel. During the transitional period, the reporting for these sectors includes both direct and indirect emissions, except for electricity, which only includes direct emissions.

Certificates

Each year, from 1 January 2026, authorised CBAM declarants (importers or indirect customs representatives) will have to buy and surrender CBAM certificates that correspond to the embedded emissions in the imported goods. The European Commission will calculate the price of CBAM certificates based on the average weekly price of ETS auctions. This ensures that CBAM certificates remain closely aligned with the price of ETS allowances. Additionally, this approach maintains a manageable system for administrative authorities overseeing the process. But for now – you only need to provide information on the emissions.

2.2 Timeline

Transitional phase: October 2023 - December 2025

CBAM focuses on monitoring and reporting only. It does not involve any financial adjustments or the need to purchase certificates. The goal is to ensure a seamless and uninterrupted rollout of the mechanism. Importers of CBAM goods, or their appointed customs representatives, will need to submit a quarterly CBAM report outlining the embedded emissions associated with goods imported, as well as any carbon pricing due. To prepare for the post transitional phase, it is possible to apply to become an authorized CBAM declarant from 1 January 2025. Applications must be submitted in the Member State of establishment.

Review and scope extension: 2025

The European Commission will use the reported information for general analysis and review of the CBAM. The conclusions will be presented in reports to the European Parliament and the Council before

the end of the transitional period. Those reports will look into different topics on the implications, implementation and functioning of the CBAM. This includes the possibility for extension of the scope to other goods, specifying the methodology and progress made in the international discussions.

Post transitional phase: 2026 - 2034

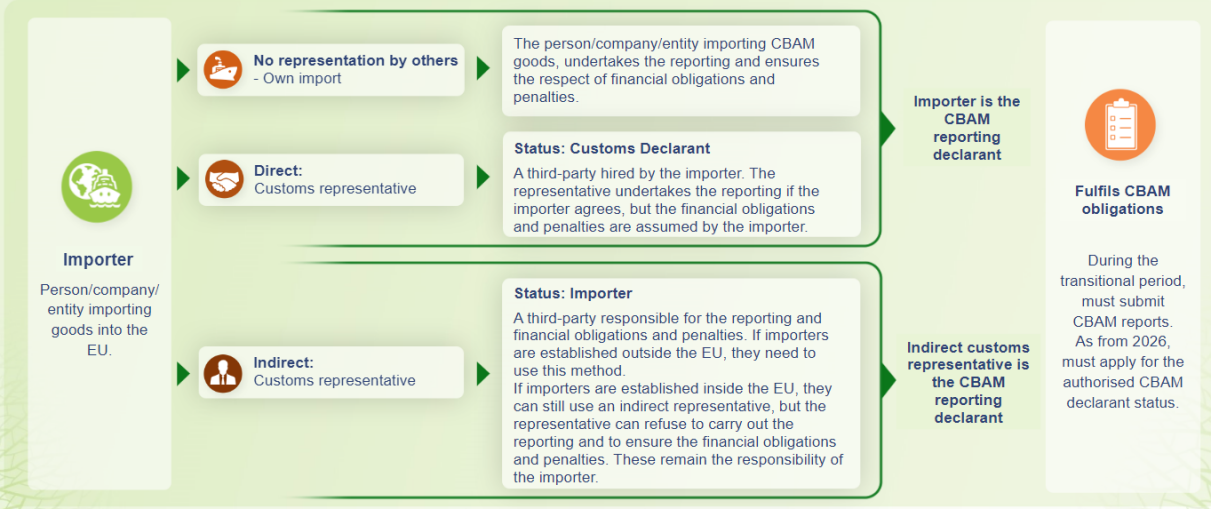
From 1 January 2026, only authorised CBAM declarants will be able to import CBAM goods into the European Union. Authorised CBAM declarants will have to buy CBAM certificates that correspond to the emissions in the goods imported. To ensure coherence with ETS, the CBAM certificates are phased in gradually and in line with the phase out of free allowances in the ETS.

2.3 Rules for representatives

How do importers know who the person responsible for the reporting obligations is?

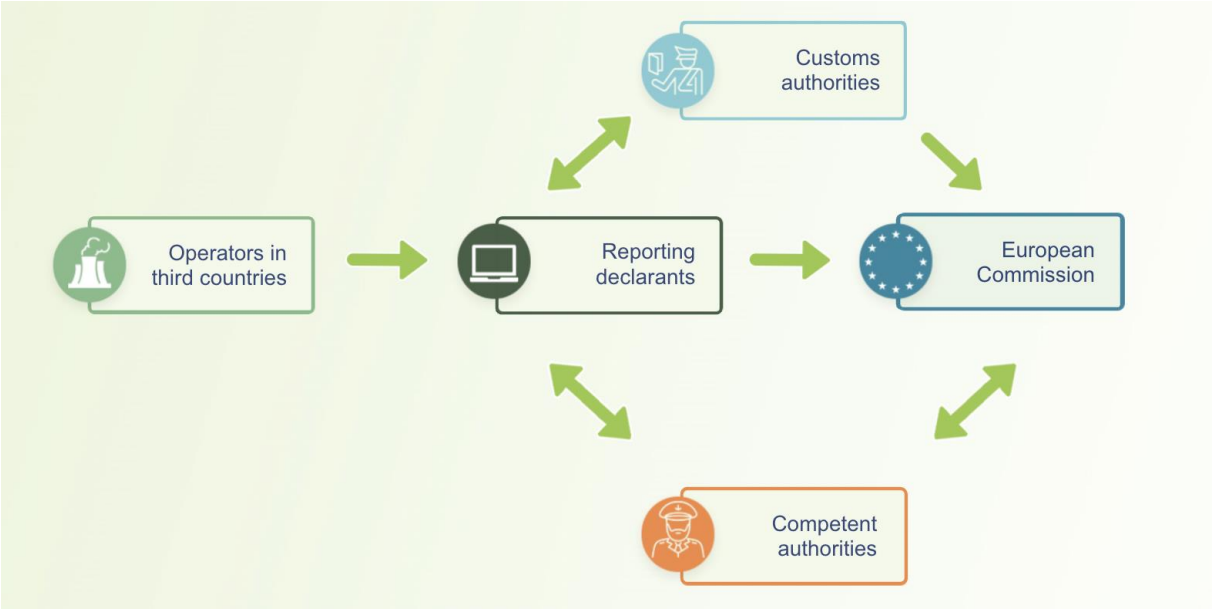
When importers import on their own, that is, with no representation by others, or use a direct representative, then the importer must be the reporting declarant. Note that direct customs representation is not possible if the importer is located outside the EU.

When the importer uses an indirect customs representative, then this representative is the one responsible for the reporting obligations. In this case the indirect customs representative is the reporting declarant.



2.4 Interactions between the reporting declarants and officials

During the transitional phase of CBAM, there is no specific authorisation process in place. Instead, a simplified procedure is applied to facilitate the initial stages of CBAM implementation. This transitional phase is designed to provide time for stakeholders to adjust and prepare for full compliance with CBAM requirements.



Operators in third countries

Operators gather and provide the necessary data related to the direct and indirect emissions associated with the imported goods. This data includes information on the production processes, specific embedded emissions, and other relevant factors.

Reporting declarants

Reporting declarants are responsible for compiling and submitting CBAM reports. They may receive the data from the operators. They analyse and process the data to ensure its accuracy and compliance with CBAM requirements. They then submit the CBAM reports to the European Commission.

Customs authorities

Custom authorities will automatically provide information to the reporting declarants to ensure that these have a clear understanding of their obligations. Additionally, customs authorities collaborate with the European Commission by sharing accurate and detailed information on imports, including customs declarations and associated CBAM-related data.

European Commission

Once the European Commission receives and reviews the CBAM reports submitted by the reporting declarants, a communication process takes place with competent authorities. This process during the transitional period will help improve the implementation of CBAM in the definitive period. Also, data exchanges with customs authorities allows the European Commission to monitor the implementation of CBAM, verify compliance, and assess the effectiveness of CBAM.

Competent authorities

During the transitional period, competent authorities carry out verifications and give feedback to the declarants about the CBAM reports. This serves to clarify any issues, address discrepancies, and ensure

compliance with CBAM requirements. As from 2025 they will deliver the authorisation to become authorised CBAM declarants.

3 CBAM methodology in the electricity sector

3.1 Calculating embedded emissions in electricity as a good

3.1.1 Which aspects of the electricity sector will be covered in CBAM

For electricity as CBAM good, there is only one aggregated goods category, which has one primary greenhouse gas (GHG) associated.

Aggregated goods categories refer to goods that are grouped based on their similar characteristics. These categories are created to simplify the administration and implementation of CBAM. Instead of assessing and monitoring goods individually by their CN codes, goods within the same aggregated goods category are treated and evaluated collectively. For electricity as CBAM good, there is only one CN code and therefore also one aggregated goods category.

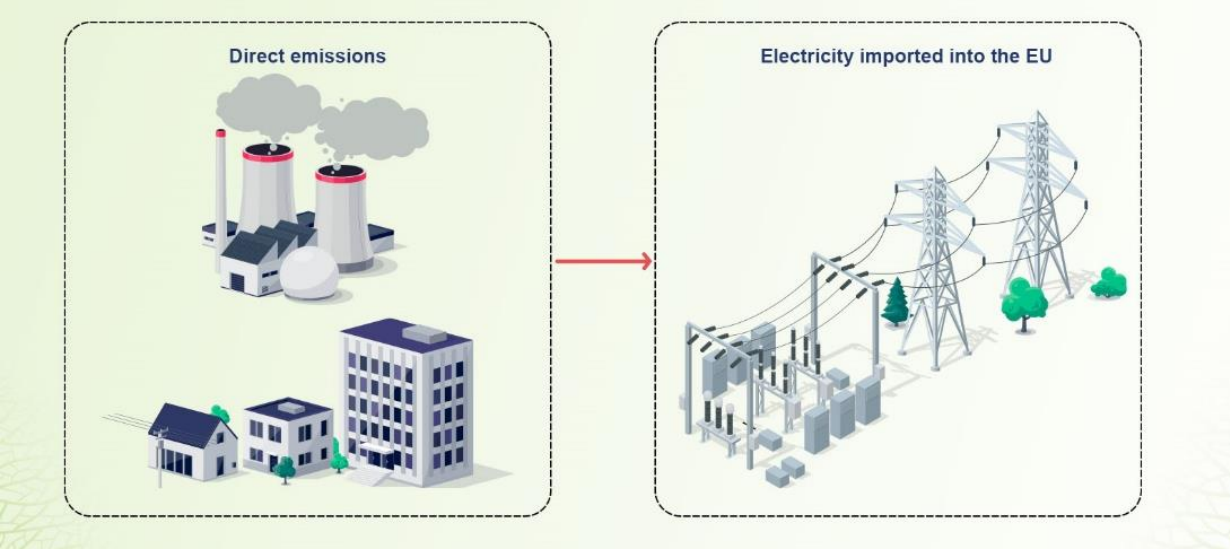
The **greenhouse gases** that need to be monitored have been defined according to the activities and emissions of the greenhouse gases listed in Annexes I Directive 2003/87/EC. In the electricity sector, only carbon dioxide (CO_2) is relevant, as it is the primary greenhouse gas emitted during the production of electricity.

The **Combined Nomenclature** (CN) is presented in the form of an organized catalogue that codifies goods which are the subject of trade and takes account on the specific characteristics of the good in question, particularly: the type of product, what is it made of, its function and how it is presented or packaged.

CN Code	Aggregated goods category	Greenhouse gas
Electricity		
2716 00 00 – Electrical energy	**Electricity**	Carbon dioxide

3.1.2 Embedded emissions in the electricity sector

Here is an overview of the emissions to monitor and report under CBAM in the electricity sector.



Direct Emissions

To determine the embedded emissions of electricity as imported goods, only direct emissions will be applicable. Direct emissions are the greenhouse gas emissions released directly during the production process at the installation level, including CO2 emissions from combustion and raw materials use.

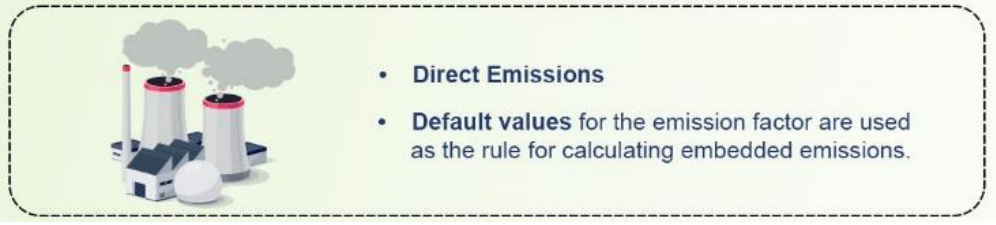
Electricity imported into the EU

For these emissions, the amount of electricity imported into the EU should be monitored. Embedded emissions are calculated by multiplying the amount of electricity with the respective emission factor.

For the calculation of emissions of electricity as a CBAM good, default values of emission factors are the main rule during the transitional period, although it is possible for declarants to report on actual embedded emissions.

3.1.3 Electricity as a good imported into the EU

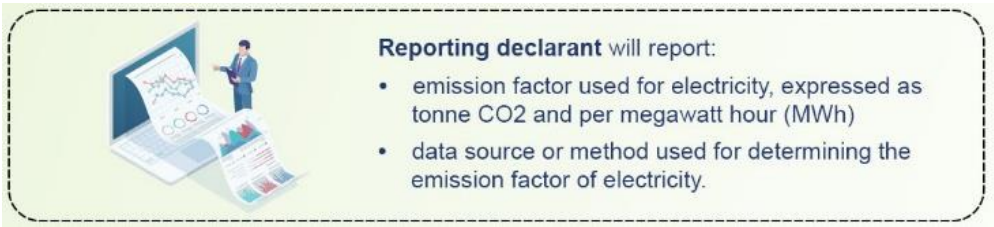
The physical characteristics of electricity are the reason for a different approach within the CBAM as compared to other goods. Where electricity is imported into the EU as a good on its own (and not included in the indirect emissions of a tangible good), specific rules apply. Firstly, only direct emissions account. Secondly, default values for the emission factor are used as the rule to calculate embedded emissions, instead of actual emissions.



For electricity as imported good, the reporting declarant will report the following information:

- the emission factor used for electricity, expressed as tonne CO_2 e per megawatt hour (MWh).
- the data source or method used for determining the emission factor of electricity.

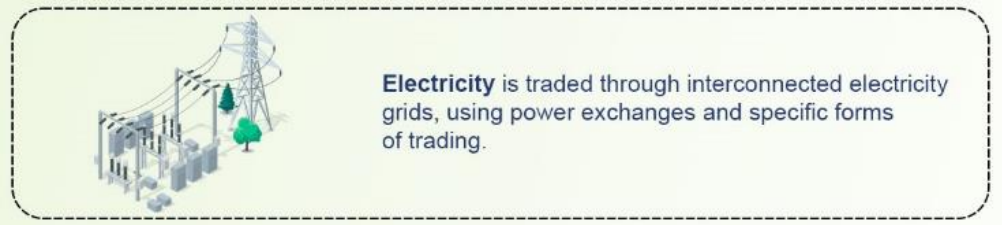
To produce electricity, the activity level refers to net electricity leaving the system boundaries of the power plant or cogeneration unit, after subtraction of internally consumed electricity.



Default values should generally be used**,** but it is possible to apply actual embedded emissions under clearly specified conditions. Electricity trade is different from trade in other goods, in particular because it is traded through interconnected electricity grids, using power exchanges and specific forms of trading. Market coupling is a specific, densely regulated form of electricity trade which enables the aggregation of bids and offers across the involved countries.

Imports of electricity from non-EU countries are covered by the CBAM. These imports are not covered by the CBAM if the electricity market of the non-EU country is integrated with the EU internal market through market coupling.

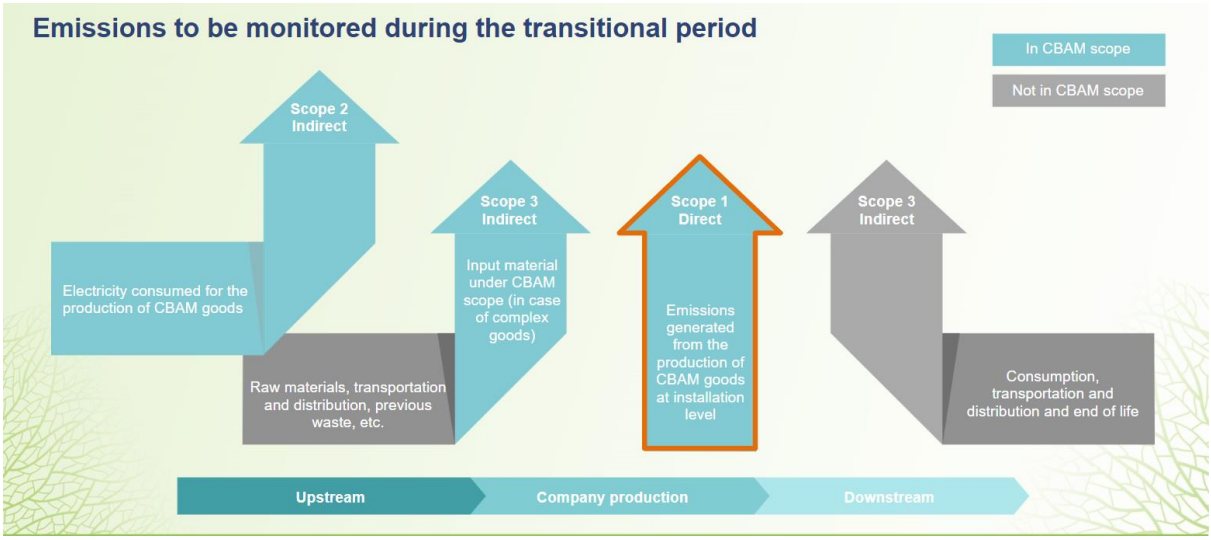
This exemption only applies if a technical solution to apply the CBAM to these imports cannot be found, and if the imports comply with the conditions outlined in Article 2.7 of the CBAM Regulation.



3.2 Collecting data

3.2.1 Emissions to be monitored during the transitional period

The EU importer or its representative is obliged to report the embedded greenhouse gas emissions of the imported goods. They get the data from the third-country installation, which does the monitoring and calculations in a primary report. In the case of the electricity sector, only direct emissions need to be monitored during the transitional period.



Scope 1 - Direct emissions:

Direct emissions refer to the greenhouse gas emissions released directly during the production at the installation level. The focus is on carbon dioxide (CO2), the most significant greenhouse gas in electricity manufacturing. It can be produced resulting from any combustion emissions and process emissions from flue gas treatment. In the electricity sector, direct emissions are relevant if actual embedded emissions are applied, and not default values.

Under CBAM, direct emissions also include emissions from the production of heating and cooling irrespective of the location where they are produced. In other contexts, these emissions fall under the category of scope 2 emissions.

3.2.2 Methodologies for monitoring and quantifying CO2 emission factor

The CO2 emission factor is the result of the division of the CO2 emission data of the electricity sector by the gross electricity generation based on fossil fuels in the relevant geographic area. The emission factor for calculating the specific actual embedded emissions of electricity is established as follows.

1. **CO2 emission factor based on specific default values**

The **specific default value for a third country**, group of third countries or region within a third country, as the relevant CO2 emission factor is used. These CO2 emission factors are based on data from the International Energy Agency (IEA) and provided by the Commission.

2. **CO2 emission factor of the EU**

When **no specific default value is available**, the CO2 emission factor in the EU is based on data from the IEA and will be provided by the Commission in the CBAM Transitional Registry.

3. **CO2 emission factor based on reliable data demonstrated by the reporting declarant**

This factor can be applied when the reporting declarant demonstrates that the CO2 emission factor in the third country from where electricity is imported is lower than the values in accordance with the CO2 emission factor based on specific default values and the CO2 emission factor of the EU.

The reporting declarant should submit sufficient evidence based on official and public information, in order to calculate the yearly CO2 emission factor per fossil fuel technology and its respective gross electricity generation in the third country exporting electricity to the EU.

The reporting declarant will then calculate the CO2 emission factor as a moving average of five years starting with the current year minus two (weighted average of the CO2 emission factor for the five-years period ending two years before the reporting).

This quantification of CO2 emission factor is aiming to reflect the impact of decarbonisation policies, such as the increase in renewable energy production, as well as climatic conditions, particularly in cold years.

4. **CO2 emission factor based on actual CO2 emissions of the installation**

A reporting declarant may apply actual embedded emissions (instead of default values) for the calculation of embedded emissions of the imported electricity, if the calculation is based on data determined by the producer of the electricity (calculated using CO2 emission factor based on reliable data), and the following cumulative criteria are met:

a) the amount of electricity is covered by a power purchase agreement between the reporting declarant and a producer of electricity located in a third country.
b) the installation producing electricity is either directly connected to the Union transmission system or it can be demonstrated that at the time of export there was no physical network congestion at any point in the network between the installation and the Union transmission system.
c) the installation producing electricity does not emit more than 550 grammes of CO2 of fossil fuel origin per kilowatt-hour of electricity.
d) the amount of electricity has been firmly nominated to the allocated interconnection capacity by all responsible transmission system operators in the country of origin, destination and, if relevant, each country of transit. The nominated capacity and the production of electricity by the installation refer to the same period of time (no longer than one hour).
e) the fulfilment of the above criteria is certified by an accredited verifier, who should receive at least monthly interim reports demonstrating how those criteria are fulfilled.

3.3 Calculating specific embedded emissions in the electricity sector

The formula for calculating specific embedded emissions in the electricity sector is as follows:

Specific embedded emissions = (Total CO2 Emissions from Electricity Production) / (Total Electricity Production)

- The numerator, “Total CO2 Emissions from Electricity Production”, represents the sum of carbon dioxide (CO2) emissions released during the entire electricity production process.
- The denominator, “Total Electricity Production”, refers to the overall amount of electricity produced within a specific timeframe. It is usually measured in megawatts and represents the total quantity of electricity produced during that period.

By dividing the total CO2 emissions from electricity production by the total electricity production, the formula provides a measure of specific embedded emissions, which represents the amount of CO2 emitted per unit of electricity produced and helps to assess the carbon emissions associated with electricity production.

It's important to note that the determination of the direct emissions for electricity requires more comprehensive methodologies that are explained in more detail in the Guidance Documents and Communication Template.

4 Reporting in the CBAM Transitional Registry

4.1 Relevant reporting requirements during the transitional phase

Information requirements regarding the electricity imported into the EU:

- quantity of imported electricity
- country of origin
- direct emissions

Reporting timetable:

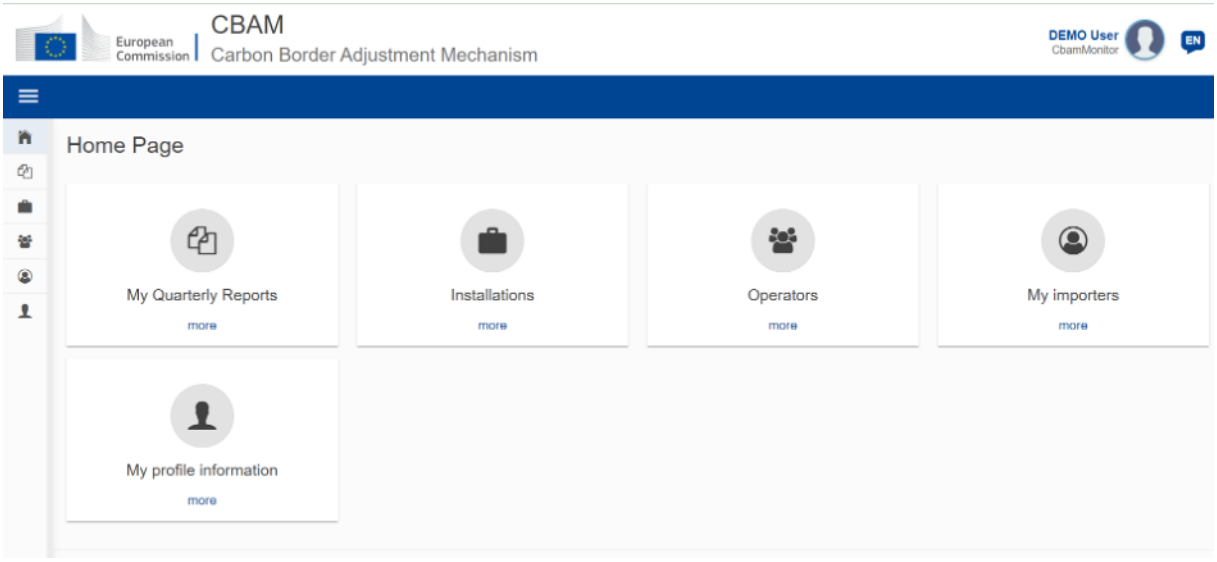
- From October 2023 to December 2025, submit reports quarterly
- First CBAM report is due by 31 January 2024
- First two reports may be modified and corrected until July 2024

Benefits of data collection:

1. helps refine the methodology for reporting and for calculating the default values
2. integrates the carbon pricing mechanisms being applied in third countries
3. addresses any difficulty faced by reporting declarants
4. ensures that the system is as user-friendly as possible

4.2 Introducing the CBAM Transitional Registry

Please note: to understand how to access the CBAM Transitional Registry, please see course Uniform User Management and Digital Signatures (UUM&DS)



My quarterly reports
All open and closed reports will be displayed on this screen. Here, you can also create new reports or rectify past reports.

Installations
The “installation” is the physical facility or industrial plant that carries out specific production processes. It can be a manufacturing plant, a power station, or any facility involved in activities covered by CBAM. For example, in the electricity sector, an installation would be a power plant. On this screen you can create a registry of the installations you import your goods from, so you can easily look them up when submitting a new report. That way you will save time as most of the information will automatically fill in.

Operators
The “operator” or “installation operator" is the entity responsible for operating the installation and carrying out the production processes. They are accountable for complying with emissions monitoring and reporting and other CBAM requirements associated with the production of goods within that installation. In the electricity sector, the installation operator would be the company managing the electricity production facility. On this screen you can create a registry of the operators associated with the installations you import your goods from, so you can easily look them up when submitting a new report. That way you will save time as most of the information will automatically fill in.

My importers
On this screen you can see the list of your importers and access their profiles.

My profile information
On this screen you can see your profile details but cannot edit the information.

4.3 Reporting in the CBAM Transitional Registry

Please refer to the course to see the demo.

Remember, this is a quick and handy summary of the most relevant course information. Only the European Union legislation published in the Official Journal of the European Union is deemed authentic. The Commission accepts no responsibility or liability whatsoever with regard to the training.

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