CBAM STEP – BY – STEP GUIDELINE

Dr Radman Šelmić
Mr Aleksandar Simić
Mr Dušan Stokić
Mr Siniša Mitrović

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СТОПАНСКА КОМОРА НА СЕВЕРНА МАКЕДОНИЈА
ECONOMIC CHAMBER OF NORTH MACEDONIA

VANJSKOTRGOVINSKA KOMORA BOSNE I HERCEGOVINE
СПОЉНОТРГОВИНСКА КОМОРА БОСНЕ И ХЕРЦЕГОВИНЕ
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With the main contribution from the Green Economy Center, certain parts of this guideline were developed as a collaborative effort by the Union of Chambers of Commerce and Industry of Albania, the Foreign Trade Chamber of Bosnia and Herzegovina, the Kosovo Chamber of Commerce, the Chamber of Economy of Montenegro, the Economic Chamber of North Macedonia, the Chamber of Commerce and Industry of Serbia, and the Western Balkans 6 Chamber Investment Forum, within the framework of the Chamber Partnership Western Balkans and Vienna Institute for International Economic Studies. Financial support was provided by the Federal Ministry for Economic Cooperation and Development (Germany).

CONTENT

LIST OF ABBREVIATIONS

AFEP – French Association of Large Companies

CBAM – Carbon Border Adjustment Mechanism

CEMBUREAU – European Cement Association

EEA – European Environment Agency

EPA – United States Environmental Protection Agency

EPRS – European Parliament Research Service

ETS – Emission Trading System

IEA – International Energy Agency

OJEU – Official Journal of the European Union

GDCIIOO – Guidance document on CBAM implementation for installation operators outside the EU

1.1. HISTORIC STEP – EU CARBON TAX FOR THE REST OF THE WORLD

The 10th of May 2023 marked a historic day for the European Union in the domain of green agenda – the EU Parliament and the Council formally adopted the CBAM (Carbon Border Adjustment Mechanism) Regulation. This Regulation went into effect on the 1st of October 2023 with numerous and long-term consequences both for economies in the EU as well as economies outside the economic block which are EU's trade partners, in particular when it comes to the goods affected by the Regulation. The transitional phase of the CBAM Regulation will last until the end of 2025 and during this period companies in the EU importing CBAM-related goods and products will be obliged to report about embedded emissions (direct and indirect), without any financial obligations in terms of buying and surrendering certificates.

The aim of this ***Guideline*** is threefold: firstly, to elaborate in great detail the broader geo-economic context as well as causes and consequences concerning the CBAM regulation; secondly, to present thoroughly and clearly technical and technological details of the Regulation and therefore be a useful manual for companies (and all other relevant stakeholders) from the Western Balkan Six region which are affected by the CBAM; thirdly, to encourage users either from the private or the public sector, to think strategically about the changes and challenges this Regulation is bringing about and consequently make adequate steps and timely actions in terms of decarbonization and adaptation of their business processes and models.

In order to understand the reasons behind adoption of such a complex EU mechanism, we have to recall first that the EU has decisively marked its strategic development towards a carbon neutral continent through the Paris Agreement signed in 2015, and in particular through the Green Deal adopted in 2019 by the EU Commission. The Green Deal defined the year 2050 as the threshold for the abovementioned ambitious plans regarding the strategic continent-wide carbon neutrality, and also 2030 as the point in time when a reduction of 55% of GHG emission in comparison to the level from 1990 should be achieved (Fit for 55). Nevertheless, in order to achieve such ambitious goals, the EU has to significantly reduce emissions in numerous sectors or substantially change most of the industries, in particular, the carbon and energy intensive ones, in addition to all the other changes such as the implementation of circular economy, the intensification of industrial symbiosis, the improvement of energy and material efficiency, switching to renewable energy resources etc.

The CBAM is a carbon and customs related tax mechanism which serves several strategic economic, technological, environmental and geo-economic purposes:

- It prevents so-called carbon leakage from the EU, when companies from the EU outsource their energy and carbon-intensive production outside the EU in countries with less strict environmental standards, in order to avoid carbon related taxation. As stated in the OJEU, "such situations could lead to an increase in the total global emissions, thus jeopardizing the reduction of greenhouse gas emissions that is urgently needed if the world is to keep the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1,5°C above pre-industrial levels. As the Union increases its climate ambition, that risk of carbon leakage could undermine the effectiveness of Union emission reduction policies" (2023:54).
- It levels the playing field between the EU companies in the ETS/CBAM affected industries and companies in the same industries but outside the EU. We should keep in mind that, until 2030, the CBAM Regulation will apply to all the ETS defined industrial sectors (Morgado Simoes, EPRS, 2023).
- It puts pressure on industries inside the EU - but also on economies/countries outside the EU which are its trade partners - to consider decarbonization through a change of business processes but also through the inception of a national carbon tax or joining the EU ETS.
- It is a strategically important step of the EU towards the goals defined in the EU Green Deal from 2019 and the Paris Agreement signed 2015.

The document states the following: "This Regulation establishes a carbon border adjustment mechanism (the 'CBAM') to address greenhouse gas emissions embedded in the goods listed in Annex I on their importation into the customs territory of the Union in order to prevent the risk of carbon leakage, thereby reducing global carbon emissions and supporting the goals of the Paris Agreement, also by creating incentives for the reduction of emissions by operators in third countries" (OJEU, 2023:64). Therefore the Annex I of the OJEU precisely defines through a list of CN codes which goods (simple and complex) are affected by the CBAM Regulation, that is, for which goods their importers have to report during the transitional period regarding embedded (direct and indirect) emissions.

These goods and products which are precisely defined are from the following energy and resource intensive industries:

- Iron and Steel
- Aluminium
- Cement
- Fertilizers
- Hydrogen
- Electricity

This ***Guideline*** will focus on Iron, Steel, Aluminium, Cement, Fertilizers and, to certain extent, Electricity. Namely, the domain of electricity – although undoubtedly exceptionally important in the context of CBAM, as discussed below – is dealt with not only by the private sector but also and predominantly by the public sector. In addition, the Electricity segment still contains some uncertainties in terms of prospective regulation and consequently options for WB6 economies. Finally, hydrogen, at the moment, is not produced and exported in the EU from the WB6 region in any significant quantities.

1.2. CBAM AND ETS – TWO SIDES OF A SAME COIN

The companies/stationary installations in the EU which have already been exposed to the EU Emission Trading System (ETS) - incepted in 2005 - have directly obliged themselves to a carbon tax (energy and heat generation, but also energy-intensive industry sectors, including oil refineries, steel works, and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids, bulk organic chemicals and, from 2024, air transport within the EU Economic Area and maritime transport). Consequently, production within the EU has been getting more expensive and strict in terms of fulfilling the requirements of environmental legislation and international standards. The EU ETS is a "cap and trade" system which applies to around 10,000 stationary installations and manufacturing industrial entities, which has reduced overall emissions in the European Economic Area (EU plus Norway, Liechtenstein and Iceland). However, these industries have already been under pressure from competition outside the EU precisely because most of the non-EU companies have not been directly and strictly affected by any of these national emission-related regulatory constraints and taxes. In order to alleviate, to some extent, the unfavorable competition – between companies in the EU which are under the ETS system and companies outside the economic block with no carbon taxes whatsoever– the EU has been allocating every year a certain amount of free allowances to companies in these sectors. Namely, the EU ETS offers companies to obtain allowances either through auctions at the beginning of the year, or through the abovementioned free allowance allocation.

It should be underlined that the EU ETS, from stationary installations, accounted for 37% of the total GHG emissions in the EEA in 2022 (see EEA, 2024) and also that in 2023 the Emission Trading System (EU ETS) has been extended to new sectors – emission from fuels used for combustion in buildings, road transport and additional sectors (mostly small industry not covered by the existing EU ETS). This so called ETS2 will be fully operational in 2027 while monitoring and reporting phase will commence in 2025. The CBAM and the EU ETS are two sides of the same coin with one substantial difference to be emphasized: the EU ETS applies to stationary installations and manufacturing sites and therefore – among others – to production of raw materials (such as iron, steel, aluminium etc) as well as electricity. Therefore, when these materials are used for production of goods

and complex products in the EU, one can argue that the carbon related tax has already been paid at the very beginning of the value/supply chain. Meanwhile, the CBAM is designed to tax importers in the EU for so-called embedded emissions for products and goods made of these raw materials, so the final goal is to make the production of the raw materials and goods outside the EU as if it is located in the EU. As it is pointed out in the OJEU, "in order to preserve its effectiveness as a measure to prevent carbon leakage, the CBAM needs to reflect closely the EU ETS price. While on the EU ETS market the price of allowances released onto the market is determined through auctions, the price of CBAM certificates" – once they are introduced in 2026 after the end of the transitional period – "should reasonably reflect the price of such auctions through averages calculated on a weekly basis. Such weekly average prices reflect closely the price fluctuations of the EU ETS" (2023:76).

In order to do so, the EU will be gradually reducing the amount of the abovementioned free allowances and increase the percentage paid by the CBAM declarants (importers). As stated in the OJEU, "the CBAM seeks to replace those existing mechanisms by addressing the risk of carbon leakage in a different way, namely by ensuring equivalent carbon pricing for imports and domestic products. To ensure a gradual transition from the current system of free allowances to the CBAM, the CBAM should be progressively phased in while free allowances in sectors covered by the CBAM are phased out" (2023:53). Therefore, importers in the EU – which are formal declarants of the CBAM – will not be paying after the transitional phase at the beginning of 2026, the full price of the emissions as if the products are made in the EU. Namely, the price will be gradually increased with the final aim that in 2034 CBAM for import will be paid in full (by CBAM declarants) and there will not be any free ETS allowances. It is also essential to be underlined that the price that declarants will be paying after the transitional period will be reduced for the amount of any carbon related tax which is already paid in the third country. However, the EU should formally recognize the concrete national carbon tax system. Here is the dynamic of the increase of the CBAM-related financial obligations, that is to say, the reduction of free allowances in the EU: the CBAM will gradually replace the EU ETS free emissions allowances mechanism, by means of a 9-year phasing-out of the free allowances under the EU ETS from 2026 to 2034, and a corresponding phasing-in of the CBAM. During this period, free emissions allowances will be reduced initially at a slower rate, which will increase as the period comes to an end. The reduction rate for free allowances, according to the EU ETS, is as follows: 2026: 2.5 %; 2027: 5 %; 2028: 10

%; 2029: 22.5 %; 2030: 48.5 %; 2031: 61 %; 2032: 73.5 %; 2033: 86 %; and 2034: 100 % (see Morgado Simoes, 2023).

1.3. WHO IS REPORTING AND WHAT IS REPORTED?

The CBAM is an EU Regulation and therefore companies registered in the EU, importing goods listed in the Annex I of the Regulation, are obliged to report regarding the embedded emissions in goods and products they are importing, that is, in goods produced along their supply chains or embedded emissions in the final products (if they are importing finished goods). In addition, they are obliged during the transitional period to do that quarterly. As the Regulation document explains in a reference to the transitional period: "For that purpose, the CBAM should apply without financial adjustment, with the objective of facilitating its smooth roll-out, thereby reducing the risk of disruptive impacts on trade. Importers should have to report on a quarterly basis the embedded emissions in goods imported during the previous quarter of the calendar year, setting out direct and indirect emissions as well as any carbon price effectively paid abroad. The last CBAM report, which is the report to be submitted for the last quarter of 2025, should be submitted by 31 January 2026" (OJEU, 2023:60).

So, during the transitional period, the EU importers are obliged quarterly to upload on the EU CBAM central registry all necessary data, for which the EU has provided adequate templates for reporting. The CBAM declaration formally uploaded by the EU Declarant should contain the following:

- the type of goods in accordance with the CN codes, and total quantity of each type of goods imported during the preceding reporting period, expressed in megawatt-hours for electricity and in tonnes for other goods
- the total embedded emissions in the goods expressed in tonnes of CO2e emissions per megawatt-hour of electricity or, for other goods, in tonnes of CO2e emissions per tonne of each type of goods, calculated in accordance with Article 7

In addition, the following three important aspects must be underlined. The first is that, during the transitional period, verification of reports is not mandatory, but starting from 2026, all CBAM-related reports will have to be verified by accredited verifiers. The second is that any inadequate reporting or missing of the formal duty by the Declarant (importer) will be fined and these fines, during the transitional period, range from EUR 10 to 50 per ton of undeclared embedded emissions. The fines could reach EUR 100 per ton by 2026. The third aspect is that there will not be – generally speaking – any exemptions from the CBAM payment starting from 2026, however, two cases should be elaborated. As a study (see Allert, Larina and Glasser,

2023) points out, there are certain conditions under which a country (companies registered in the country) or companies can be exempt from paying the CBAM fee or paying it in full: "first, if a country is participating in the EU ETS, it is exempt. Second, if a trading partner country has implemented a domestic carbon price in the relevant sectors, this price will be deducted from the CBAM fee. For example, if the EU ETS carbon price is EUR 90 per tonne of CO2e (a realistic level) and the national carbon tax (applied to a relevant sector) in a country X is EUR 40 per tonne of CO2e, the CBAM fee will be EUR 50 per tonne. The same applies to export duties based on the carbon content of products, if they are (or will be) implemented" (2023:5).

Nevertheless, in order to report timely and adequately, every single EU Declarant has to know, in great detail, these data for each of his suppliers affected by the CBAM regulation. For the first two reporting periods, until July 2024 of the transitional period, Declarants/ and exporters were allowed to use default values for all the direct and indirect emissions. After that period, these default values are allowed to be used for the calculation of indirect emissions for precursors in complex goods (just up to 20%), and must be used for electricity export. Therefore, as the GDCIIOO clearly states, "the quarterly report should summarize the embedded emissions in goods imported during the previous quarter of the calendar year, splitting out direct and indirect emissions, as well as any carbon price due outside the EU. For deciding at what date a good was imported, the "release to the market" (i.e. the clearance by the customs authorities) is relevant" (2023:27).

Furthermore, in terms of reporting standards used during the transitional period, the EU has provided certain flexibility. Namely, for the first year of the transitional period, that is until the 31st of December 2024, companies can select one of the following reporting (MRV) standards:

- full reporting according to the new CBAM methodology (the EU method)
- reporting based on equivalent third country national systems
- reporting based on reference/default values (minimum)

However, after that period, only the EU method will be accepted and according to that standard the following principles are affirmed:

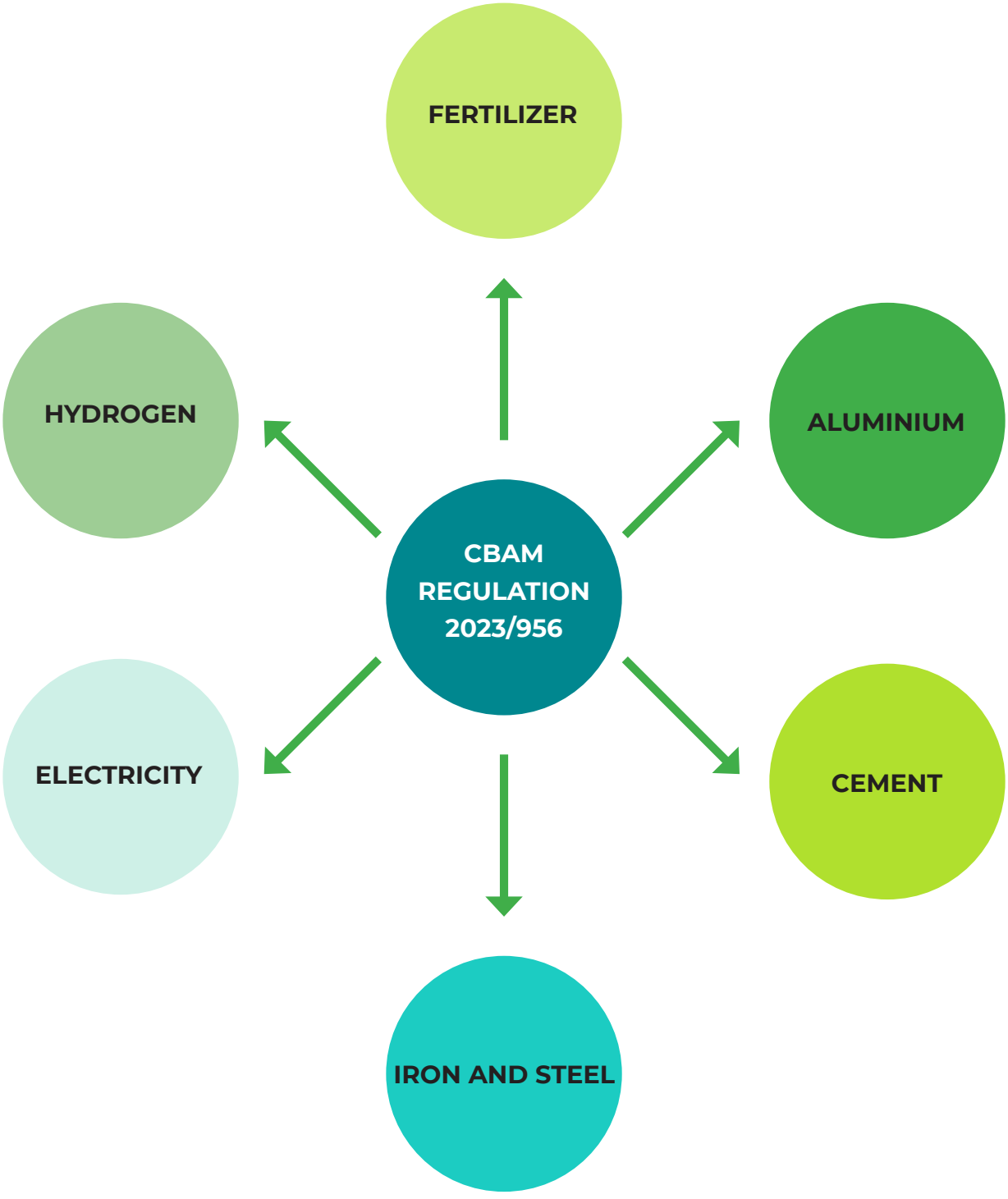
- **Direct emissions** are considered to be emissions from the production processes of goods, including emissions from the production of heating and cooling that are consumed during the production processes, irrespective of the location of the production of the heating or cooling
- **Indirect emissions** are emissions from the production of electricity which is consumed during the production processes of goods, irrespective of the location of the production of the consumed electricity (see KPMG, 2023).

1.4 WHAT ARE EMBEDDED (DIRECT AND INDIRECT) EMISSIONS?

In order to report adequately, companies have to understand, in depth, what the direct and indirect emissions are. Direct emissions are related to the site of production and installation(s), that is to say, all the emissions generated directly through technological processes such as:

- Heating
- Cooling
- Thermal processing of certain materials
- Heat and waste gases
- Precursors (produced either at the same manufacturing site or somewhere else)

Therefore, it is exceptionally important for installation operators (that is, entities doing reports) to define the boundaries of the installation. In terms of defining and determing the boundaries of the installation, the principles are similar for all the abovementioned CBAM-affected industries. As the GDCIIOO explains: “the first element is the monitoring of direct emissions of the installation. However, monitoring of an installation’s emissions is only the initial part of determining embedded emissions of a product. Whenever an installation produces several different products, the emissions must also be appropriately attributed to the individual products. Due to the specific rules for attributing emissions to goods, there is also a need to determine certain flows of heat (steam, hot water, etc.) to and from the installation, and between relevant production processes. The same applies to so-called “waste gases” (e.g. blast furnace gas in the steel industry). Both heat and waste gases contribute to the direct emissions. You must also monitor and report to the reporting declarant(s) the quantities of specific input materials which themselves have embedded emissions (the so-called “relevant precursors”, which are themselves CBAM goods) used in the manufacturing process, and determine the embedded emissions of these precursor materials. Where you purchase precursors to produce other CBAM goods, you need to obtain data on the embedded emissions from the supplier of these precursors” (24-25). In relation to precursors, it is vital understand that precursors should be included in total embedded (direct emissions) if the precursor(s) is on the list of CBAM goods defined in Annex I of the Regulation. If this is the case, the operator of the installation has to carefully include these emissions if the precursor is produced at that site, but, if it is not, the operator has to ask its supply chain partner to provide them with the total embedded emissions for that particular precursor(s).


FERTILIZER
HYDROGEN
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CBAM REGULATION 2023/956
ELECTRICITY
CEMENT
IRON AND STEEL

CBAM also applies to indirect emissions. These are related to electricity used in the production process, or, to put it more precisely, to emissions related to the production of electricity which is used for the concrete manufacturing process. In addition, the indirect emissions are related to heating or cooling processes of the very site, even if the source of the heating or cooling is not at the production site. Therefore, it is clear that the source of electricity – whether from renewable energy resources, from a coal power plant or from a hydro power plant – does affect the carbon balances of a company, and consequently, its CBAM report. As the document points out: "indirect emissions are the emissions arising from the generation of electricity used to produce the goods to which this Regulation applies. The inclusion of indirect emissions would further enhance the environmental effectiveness of the CBAM and its ambition to contribute to fighting climate change. Indirect emissions should, however, not be taken into account initially for the goods in respect of which financial measures apply in the Union that compensate for indirect emissions costs incurred from greenhouse gas emission costs passed on in electricity prices" (OJEU, 2023:54).

1.5. MONITORING AND REPORTING CBAM PARAMETERS (IN 4 STEPS)

STEP 1: Define system boundaries, production processes and production routes

In order to determine the embedded emissions of the aggregated commodity categories covered by Section 2 of Annex II of the Implementing Regulation, the operator must define the boundary of the goods production system. Determining the boundary of the goods production system includes:

- all relevant production processes or equipment used during the production of CBAM goods
- all fuel, energy (electricity, thermal energy or waste gases) and material flows entering and leaving these production processes
- GHG sources emitted directly from these production processes and, if relevant, during the production of spent energy and precursors

Note:

- "Installation" means a stationary technical unit where the production process takes place
- "Production process" means parts of the plant where chemical or physical processes are carried out for the production of goods within the aggregated (summary, unified) category of goods and its specific system boundaries in terms of inputs, outputs and corresponding emissions
- "Aggregated (summary, unified) category of goods" means a set of goods with different CN codes, but which is suitable to be covered by common monitoring rules, where each "Aggregated category of goods" corresponds to one production process
- "Production route" means the specific technology used in the production process for the production of goods within the collective category of goods

STEP 2: Determine the reporting period

The reporting period is the period for determining embedded emissions and this period is not the same for plant operators and importers.

For the plant operator - the default reporting period is 12 months to collect representative data reflecting the plant's performance on an annual basis. It can be:

a) a calendar year, which is the default option

or

b) a fiscal year, if the data for the fiscal year is more precise or to avoid unreasonable costs

As an alternative, the plant operator can take the last three months for the reporting period, if the plant is within a qualified MRV (Monitoring, Reporting, Verification) system and the reporting period matches the requirements of that MRV system. The twelve-month period is considered representative as it reflects seasonal variations in plant operation, as well as any periods of process downtime resulting from planned annual outages (e.g. for maintenance) and start-ups.

For the importer - during the transitional period, the reporting period for importers (reporting declarants) is quarterly, namely:
a) the first quarterly report is for the period October-December 2023, with the obligation to submit the report by January 31st, 2024
b) the last quarterly the report is for the period October-December 2025, with the obligation to submit the report by January 31st, 2026.

STEP 3: Determine which parameters should be monitored

1. Monitoring of direct emissions from the plant. Whenever a facility produces several different` products, these emissions must also be appropriately attributed to the individual products according to the rules for attributing emissions to goods.

Note:
Direct emissions include emissions from combustion and processes for the plant, but also emissions produced during the production of thermal energy consumed in the plant, in case the plant receives heat from neighboring installations or from the district heating network.

2. Monitoring of indirect emissions released due to the use of electricity consumed during the production of all CBAM products must be attributed to the manufactured goods. Also, emissions embedded in precursors must be included where relevant.

Note:
Indirect emissions include emissions related to the electricity consumed in the plant. If the installation itself produces electricity, the fuels consumed in the production of electricity are counted as direct emissions of the installation.

3. Monitoring and reporting on the quantities of specific input materials (so-called "precursors") that by themselves have built-in emissions used in the production process and determining the built-in emissions of these precursors;

Note:
When precursors are purchased, it is necessary to obtain data from the suppliers of these precursors on the embedded emissions of the precursors used in the production of CBAM goods.

If the precursor is produced in your installation, all relevant monitoring has already been done. When calculating the total incorporated emissions in the final product it is only necessary to consider the incorporated emissions of the precursor.

If the precursor is purchased from other suppliers, data needs to be requested from the relevant manufacturers in the same way that data is requested from you when your goods are imported into the EU.

If one has both purchased and self-produced precursors, it is necessary to track the amount of each precursor used during the reporting period for each of the production processes.

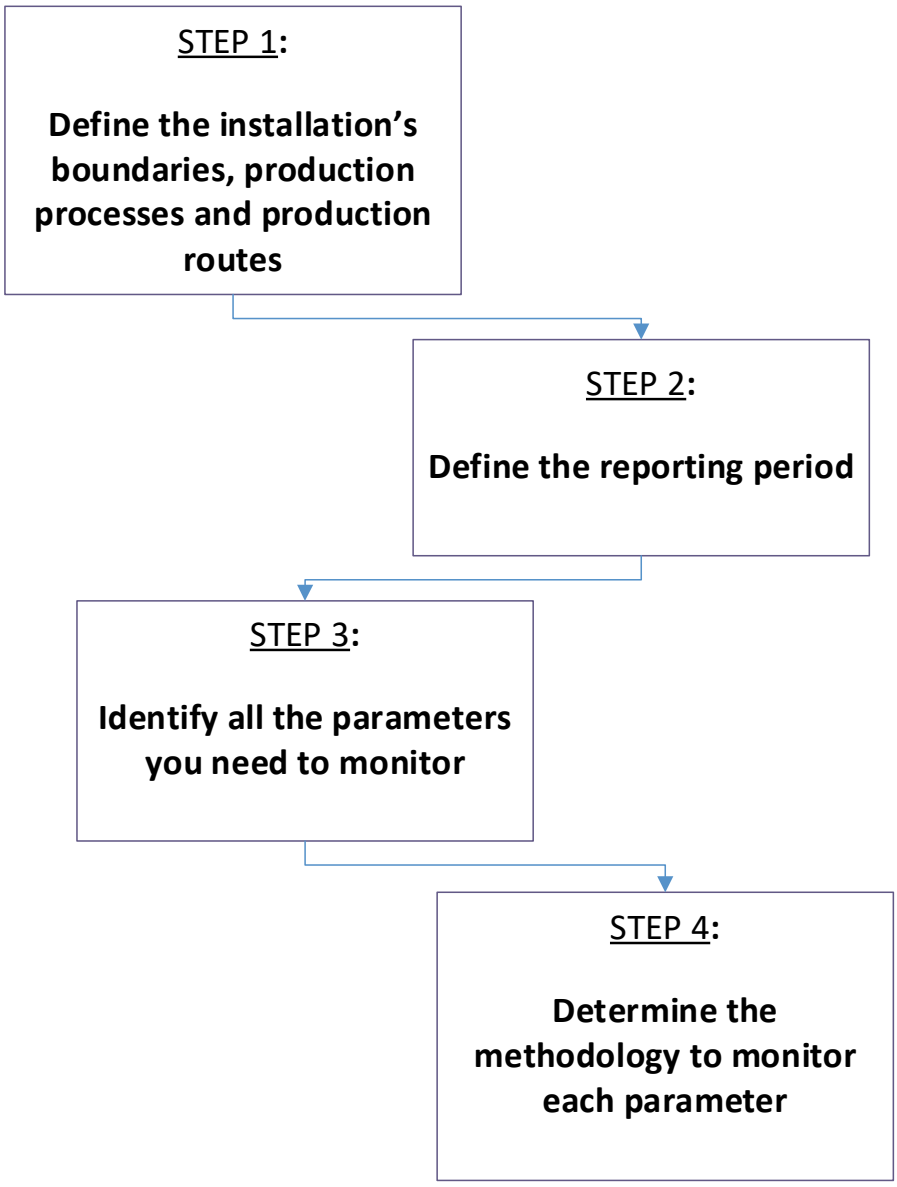
STEP 4: Determine the methodology for monitoring each parameter

- For the amount of fuel and materials consumed (including precursors), measuring instruments that provide data during the reporting period can be used, or this data can be obtained from purchase records and stock measurements at the end of each period.
- For the calculation factors (e.g. carbon content of the fuel or material), "standard values" from the relevant literature (in particular, the National GHG Inventory compliant with the UNFCCC/Paris Agreement or from

Annex VIII of the Implementing Regulation) can be used, or they can be determined on the basis of laboratory analyses, according to the rules from B.5 Annex III of the Implementation Regulation.

•For continuous measurements of emissions, heat flows and electricity, the instruments to be used must also be defined, with appropriate calibration and maintenance measures applied to this equipment.

What do you need to monitor?



As a last resort, if you have no other methods available to monitor the embedded emissions of your goods, and, in particular, if the manufacturer of the precursors you have used do not provide the necessary data, you can use the default values for the embedded emissions of CBAM goods (which include

all relevant precursors) that the European Commission places on disposition for that purpose. For more details on the use of default values, see the following useful link on the website of the Chamber of Commerce and Industry of Serbia: https://pks.rs/strana/sekcija/cbam-default-vrednosti-cbam

1.6. FORM AND STRUCTURE OF REPORTING

Section 6.11 of the Guidance document on CBAM implementation for installation operators outside the EU (December, 2023) explains the reporting template, i.e. the template which the European Commission provides for communication between operators of installations producing CBAM goods and EU importers to provide the data the latter require for producing 'quarterly CBAM reports', i.e. for complying with the CBAM Regulation. That template is also proposed for communication between operators producing complex goods and their suppliers of precursor materials.

Reporting template

While considering how an operator should account for and report production and embedded emissions during the CBAM transitional period, it should be noted that there is no formal reporting obligation, but only the need to *communicate* the emissions data to EU importers of exporters' goods. The key sections in the Implementing Regulation for reporting relevant for the CBAM transitional period are:

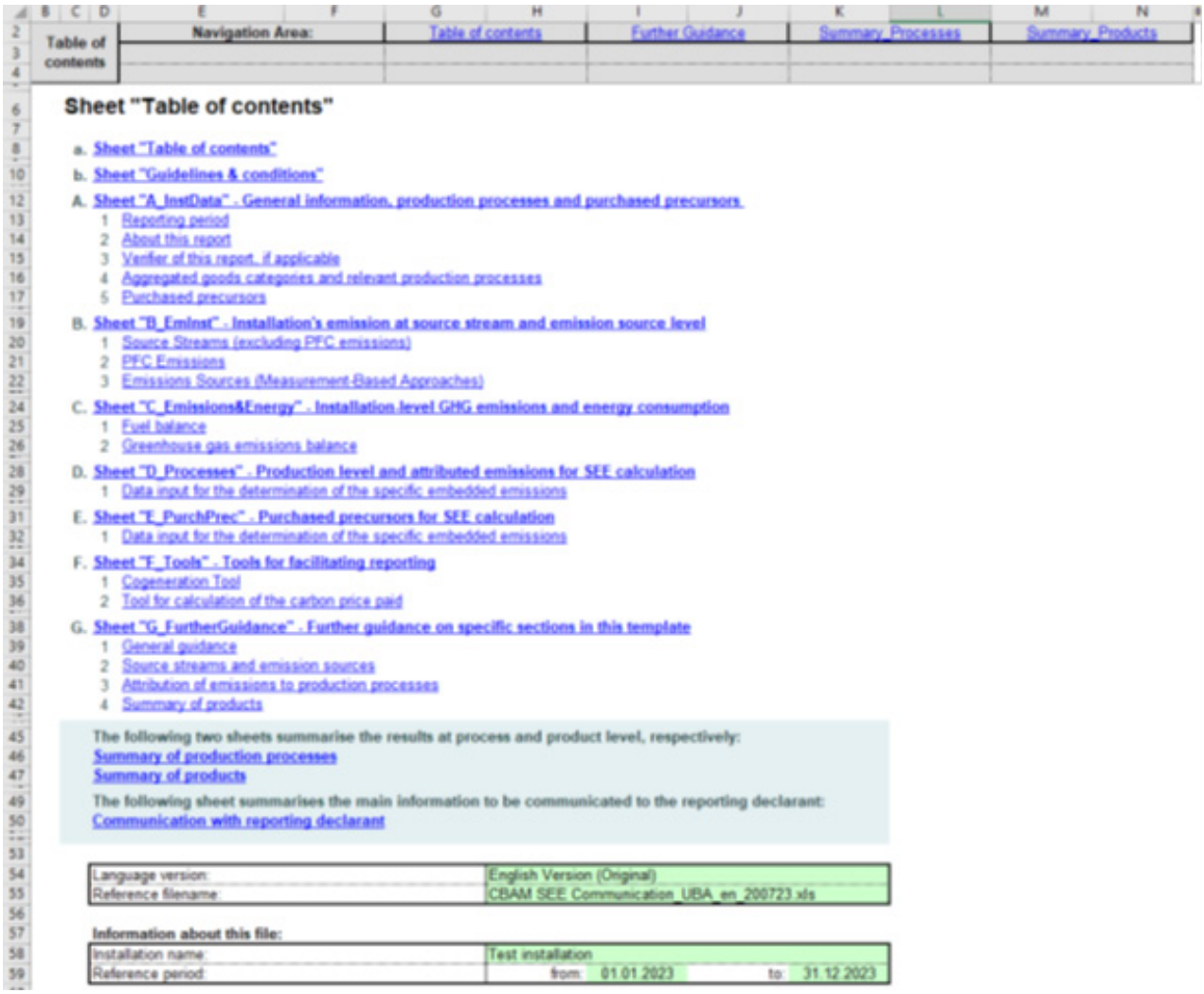
- Annex II, Section 1 Definitions
- Annex III, Section F Rules for attributing emissions from an installation to goods
- Annex III, Section I Communication by the operator of the data for the use by the reporting declarant in the CBAM report
- Default values for the calculation of embedded emissions, determined by the European Commission and published on their dedicated website for the CBAM

Installation operators are responsible for monitoring and reporting the

embedded emissions of goods they have produced and are exporting to the EU to the importers of these goods.

An electronic version of the **Emissions data communication template**, in spreadsheet format, has been developed by the European Commission to help operators. This is introduced by the following *Figure 6-6* and the spreadsheet tool is available from the European Commission's dedicated website for the CBAM.

Voluntary electronic data communication template



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4 Summary of products

The following two sheets summarise the results at process and product level, respectively:
Summary of production processes
Summary of products
The following sheet summarises the main information to be communicated to the reporting declarant:
Communication with reporting declarant

Language version:	English Version (Original)
Reference filename:	CBAM SEE Communication_UBA_en_200723.xls

Information about this file:

Installation name:	Test installation
Reference period:	from 01.01.2023 to 31.12.2023

Verification

The verification of the CBAM reports is not mandatory during the transitional period. However, the Informal Expert Group on the CBAM announced on the 1st meeting in April 2024 that verification and accreditation is expected to be defined by the end of 2024 by two documents: 1) Implementing Act on accreditation scope and verification principles and 2) Delegated Act on accreditation process.

1.7. ELECTRICITY

In the context of the CBAM Regulation, electricity is exceptionally relevant due to several factors. Namely, not only is the export of electricity from the WB6 (and the rest of the world) into the EU directly defined and affected by the Regulation, but it also, through indirect emissions, affects the carbon balances of companies which are producing goods on the CBAM list (Annex I of the Regulation). The export of electricity is not the primary subject of this ***Guideline*** because it is predominantly designed for companies in the WB6 exporting other goods. Nevertheless, the following important aspects will be discussed below:

- The first is related to the aforementioned indirect emissions, that is, the amount of electricity used in the production processes expressed in tonnes of CO2 emissions per megawatt per hour, if the electricity is taken from a grid or even generated at the production site. This brings us to the question of the source of the electricity - namely, if the electricity is taken from a grid, what is the structure of the energy mix of the particular economy? Alternatively, the electricity may be generated with renewable energy sources, such as from wind turbines or solar systems. Only after taking into account these two aspects – the amount of electricity used and its origin – can a company understand in great detail its own carbon balances.
- The second aspect is related to the current export of electricity into the EU under the CBAM Regulation, considering the price for export after the transitional period, and further taking into account the unfavorable energy mix of several economies in the region
- The third aspect is related to a rather macroeconomic issue – how the potential national or regional WB6 Emission Trading System for electricity will impact regional economies in terms of costs and benefits. Let us underline that the very Regulation offers leeway for local economies, so that they could get exemption for electricity in the context of CBAM under the presumption that they commit themselves to forming a sort of ETS by 2030. However, the

costs and consequences of the national or regional ETS are, in our view, not discussed enough in public.

With regards to the first aspect, it should be understood that Guidance document on CBAM implementation for importers of goods into the EU clearly states that if "the electricity comes from the grid, you use the default emission factor provided by the European Commission based on IEA11 data. If you produce electricity yourself in your installation (you are an "autoproducer"), you need to monitor the emission of the power plant or CHP plant12 in the same way as you monitor other direct emissions of yours" (2023:71). Therefore, the emission factors for individual economies are defined by the IEA (International Electricity Agency) whereas for autoproducers these emissions should be monitored and defined. Due to the aforementioned emission factor which is individual for every single economy (national electro – energy system), it is clear that the macro status (in terms of energy mix and what percentage of electricity is coming from coal power plants) is replicated on the micro level of every single company affected by the CBAM (which takes electricity from a grid). This brings additional challenges to companies coming from economies with an unfavorable energy mix (with a high emission factor) and makes their competitiveness on the EU market more complicated. This is going to be the case particularly after the transitional period in 2026.

Regarding the second aspect of the electricity related discussion, it should be underlined that the Regulation defines the possibility for certain economies or even regions to be exempted from the CBAM obligation for the export of electricity but only after strict conditions are met. These conditions are as follows: "Once the electricity markets of third countries are closely integrated into that of the Union through market coupling, technical solutions should be found to ensure the application of the CBAM to electricity exported from those countries into the customs territory of the Union. If technical solutions cannot be found, third countries whose markets are coupled with that of the Union should benefit from a time-limited exemption from the CBAM until 2030 with regard solely to the export of electricity, provided that certain conditions are met. Those third countries should, however, develop a roadmap and commit to implementing a carbon pricing mechanism providing for a price that is equivalent to the EU ETS, and should commit to achieving carbon neutrality at the latest by 2050 as well as to align with Union legislation in the areas of environment, climate, competition and energy. Such exemption should be withdrawn at any time if there are reasons to believe that the country in question does not fulfil its commitments

or if it has not adopted by 2030 an emissions trading system equivalent to the EU ETS" (OJEU, 2023:56). Addressing the potential CBAM exemption brings us to the final, exceptionally important aspect – considering the price of the integration of the national electro energy systems for economies with such an unfavorable energy mix into the EU Emission Trading System. Certain rough calculations are estimating that the cost would be – even under an optimistic scenario of the progressive development of renewable energy sources and the subsequent reduction of the percentage of coal plant-produced electricity – relatively high and would consequently be channeled down towards the real sectors and citizens.

2.1. METAL SECTOR - GENERAL CONSIDERATIONS

It is essential for every operator outside of the EU to check whether their product falls under the CBAM regulation. Operating in one of the six relevant industries doesn't necessarily mean that a produced good is relevant to CBAM. The CBAM Regulation, Annex I and Implementing Regulation, Annex II give an integral list of relevant CN codes. The overall principle is simple - if the product is listed there, it is mandatory to report on it.

The second step in the CBAM calculation is to determine the system boundaries. During this process, several key criteria must be considered:

- The system boundaries should encompass the physical units executing sequential process steps to manufacture the product

- Any other dedicated units constituting 100% support to the production process and enabling it to attain and sustain full production capacity should be encompassed within the system boundary

- Units employed by more than one production process need to be virtually split by treating their emissions separately

- Only stationary units are within the system boundary; emissions from vehicles operating between different production sites are excluded from the system boundary of a production process. Nevertheless, emissions from vehicles operating within the gate of a production site/installation should be included in the overall emission balances

A special case that needs to be considered is so-called inward processing. Within this mechanism, non-Union goods are imported to be used in the customs territory of the Union in one or more processing operations, such as for the purposes of manufacturing or repair. When imported, such goods are not subject to:

1. Import duty
2. Other taxes related to their import, such as VAT and/or excises
3. Commercial policy measures[1]

This means that a good is imported into the EU for processing with the suspension of import duties and VAT. After the processing operations, the products or the original imported goods can then be either re-exported or released for free circulation in the EU. The latter would imply the obligation to pay import duty and taxes, as well as the application of commercial policy measures. The same principles are reflected in the CBAM. If, after processing, an inward processing good is re-exported from the EU, there is no need for CBAM reporting. If, however, this good is relaesed on the EU market (processed or in the original state), CBAM obligation automatically arises. In the case of cogeneration (CHP), which is considered a single process, the split of emissions between heat and power must be calculated using certain assumptions and formulae to allocate emissions to each output (Guidance chapter 6.8.4).

Waste gases, especially in the iron and steel sector, can often be utilized. Being a mixture of CO_2, incompletely oxidized carbon and sometimes hydrogen and other gases, they have an energy content that can be used. Their recovery actually lowers embedded emissions since it avoids emissions that would otherwise be produced through the combustion of another fuel to produce this energy. Waste gases that are recovered are either used in the production process or installation in which they originate, or are transferred to a different production process or installation.

[1] https://taxation-customs.ec.europa.eu/customs-4/customs-procedures-import-and-export-0/what-importation/inward-processing_en

In ensuring comprehensive coverage of relevant emissions, the following principles apply:

- For an installation with a single production process, all relevant emissions from the installation (100%) should be attributed to the CBAM good production process
- For an installation with multiple relevant production processes, the operator should, when necessary, allocate shared equipment, 'source streams,' and emission sources among the identified production processes

Consequently, all inputs, outputs, and corresponding emissions within your installation should be assigned to a production process unless they pertain to any non-CBAM good

Depending on the operator's country of origin and the consequential energy mix within it, indirect emissions, arising from the production of electricity that is consumed during the production of CBAM goods, could represent a significant portion of embedded emissions, especially in countries that heavily rely on fossil fuels for electricity production. An operator's options in this regard, i.e. lowering indirect emissions, are quite limited. Aside from general measures of improving energy, material and operational efficiency, changing technology (in most cases regarded as non-economic) and inability to change the emission factor of the power grid (location-based) supplying electricity to the operator, the only other option is a market-based approach. This offers two options. One is the production of renewable energy by the operator itself. Since the scope of the CBAM is narrower than that of the life cycle assessment or carbon footprint of a product, CBAM considers emissions from renewable sources to generally have zero emissions since it does not consider upstream or downstream emissions (only the direct CO_2 emissions during the production of the electricity). The other option is a power purchase agreement which is not legally determined in many countries outside of the EU. Some of the market-based mechanisms, like Guarantees of Origin or Green Certificates, already widely established, cannot be used to justify the use of actual emission factors. So, if the operator has obtained Green Certificates, for example, in its country of origin, these cannot be used to claim zero indirect emissions (in proportion to the quantity of the Green Certificates purchased) under the CBAM mechanism.

Location-based power grid CO_2 emission factor is calculated based on the weighted average of the CO_2 emission factor for the five-year period ending two years before the reporting. This data is published by the International Energy Agency (IEA). They are provided by the Commission in the CBAM Transitional Registry. The final option for the emission factor (electricity or CO_2) is to use publicly available data for the national grid.

It is very important to notice the differences in reporting direct and indirect emissions during the transitional and definitive periods. During the transitional phase, importers must report both direct and indirect emissions for all goods covered by the CBAM. However, once the definite phase commences on January 1st, 2026, the CBAM scope will only encompass direct emissions for iron/steel, aluminium and hydrogen. Importers of cement and fertilizers will still be required to declare both direct and indirect emissions.

One option that does not require of the operator to change used technology, allowing at the same time the reduction of direct emissions, is carbon capture and use/storage (CCUS). These techniques are becoming increasingly available on the markets to reduce GHG emissions. What is important is that such emission reductions can be considered when determining embedded emissions in CBAM goods. Captured CO_2 must be used for production in which it is permanently chemically bound or that the captured CO_2 is transferred to a long-term geological storage site. Allowing CCUS in the CBAM offers a wide area of possible paths in lowering embedded emissions. The downside are the costs, which are still significant.

An important aspect of calculation, especially in the region of the Western Balkans, is the usage of biomass. It can be used as a process input or as a fuel. If used as a process input (charcoal as a reducing agent in a blast furnace, for example), emissions from biomass use are not accounted for. If used as a fuel, consequential emission must be accounted for unless criteria from the Renewable Energy Directive (EU) are a met.

2.2. IRON AND STEEL SECTOR

The implementing Regulation references relevant to the CBAM transitional period in the Iron and Steel sector, are:

> Annex II, Section 2, Table 1 Mapping of CN codes to aggregated goods categories
> Annex II, Section 3 Production routes, system boundaries, and relevant precursors, as specified in sub-sections: 3.11 – Sintered ore; 3.12 – Ferro-manganese, Ferro-chromium, Ferro-nickel; 3.13 – Pig iron; 3.14 – DRI; 3.15 – Crude steel; and 3.16 – Iron or steel products

The volume of imported goods from the iron and steel sector into the EU should be stated in metric tonnes and reported separately for each type of sector goods, by the installation or production process in the country of origin. Associated activities are production, melting or refining iron or steel or ferrous alloys, and the manufacture of semi-finished and basic steel products. The only relevant GHG is carbon dioxide (CO_2). Direct emissions should be expressed in tonnes (metric) of CO_2e and data gathered for indirect emissions should encompass the quantity of electricity consumed (MWh), the source and emissions factor used to calculate the indirect emissions in Tonnes (metric) of CO_2 or CO_2e. It is important to note that indirect emissions are to be reported separately during the transitional period. Embedded emissions must be expressed in tonnes CO2e emissions per tonne of goods and reported separately for each type of goods by installation in the country of origin.

For practical examples of the calculation of specific embedded emissions (SEE) values for iron to steel products, it is noteworthy that the Guidance document on CBAM implementation for installation operators outside the EU (further Guidance), Section 7.2.2, publicly available on EC CBAM web site, provides various case studies. These values are determined using the mass balance method because of the need to account for the difference between the total amount of carbon that enters a system (raw materials) and the ones that leaves the system (goods and scrap). Additionally, the section outlines the methodology for calculating the embedded emissions of imports into the EU. Subsequent sections detail how the system boundaries for goods in the iron and steel sector should be defined. They also specify the components of the production process that must be included for the purpose of monitoring and reporting.

The following table gives the aggregated goods categories that encompass both finalized products and precursor goods (intermediate products) utilized in the manufacturing of iron or steel products and the relevant precursors.

Table 1: Iron& Steel - aggregated goods categories, their production routes and possibly relevant precursors

Aggregated Goods Category	Relevant precursors
Sintered Ore	None
Ferro alloys (FeMn, FeCr, FeNi)	Sintered ore, if used in the process
Pig iron (blast furnace route, smelting reduction)	Hydrogen, sintered ore, ferro alloys, pig iron/DRI (the later if obtained from other installations or production processes and used in the process)
Direct Reduced Iron (DRI)	Hydrogen, sintered ore, ferro alloys, pig iron/DRI (the latter if obtained from other installations or production processes and used in the process)
Crude steel (basic oxygen steelmaking, electric arc furnace)	Ferro alloys, pig iron, DRI, crude steel (the latter if obtained from other installations or production processes and used in the process)
Iron or steel products	Ferro alloys, pig iron, DRI, crude steel, iron or steel products (if used in the process)

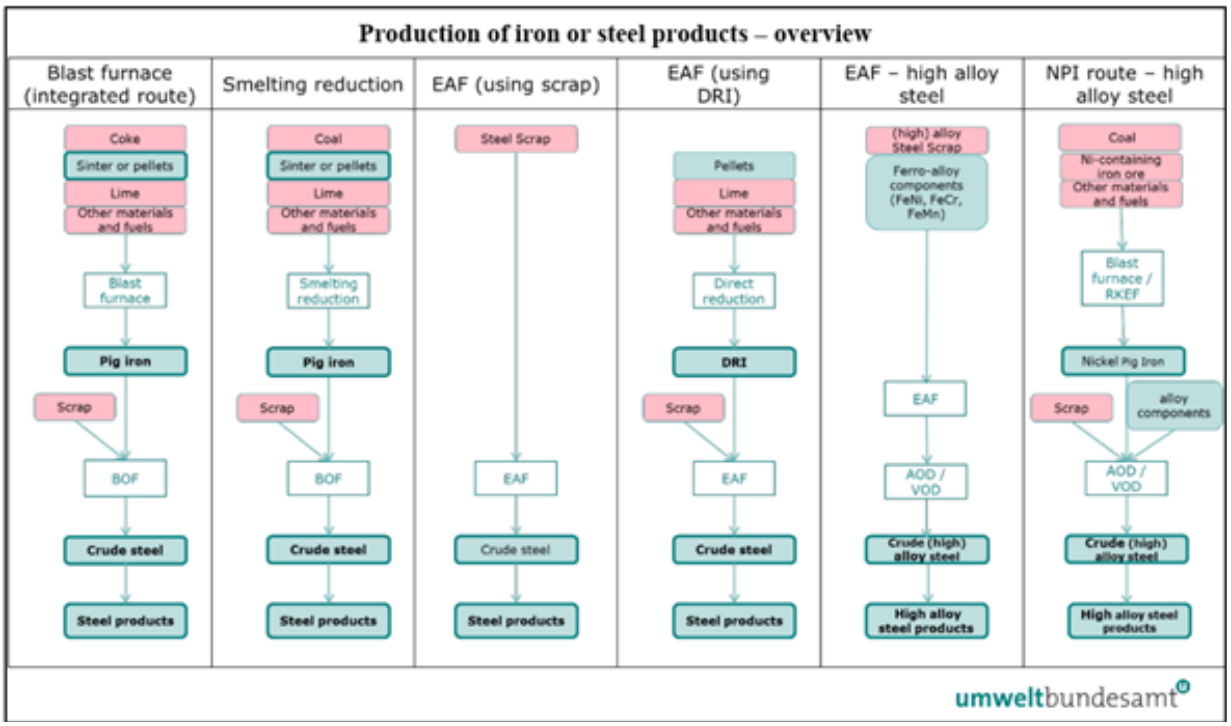
When accounting for the specific embedded emissions of a precursor, it is very important to have exact information about the ratio of the input mass of a precursor (and the potential recycled content) and the mass of the final product because this number heavily impacts the final SEE.

Certain examples from the Western Balkans have shown that a precursors embedded emissions have the greatest impact on the reported specific embedded emissions. The actual precursor's SEE are preferably reported by its producers (from within or outside of the EU, as explained further below- the precursor's specific direct and indirect embedded emissions have to be communicated) or taken as a default value (for a limited time) and, aside from choosing suppliers based on the SEE of their products, operators do not have a way to influence those. What they can do is exploit the fact that a precursor's SEE is multiplied by the mass ratio of the precursor used in the production process and the total goods produced. So, if the percentage of recycled materials (carrying zero embedded emissions) that are entering the production process instead of the precursor is high, the mentioned mass ratio will be low, and therefore the total contribution of the precursor's SEE will be proportionally lower.

When considering emissions embedded in precursors, special attention should be made to their country of origin. Following CBAM founding principles and complementarity with the EU ETS, during the transitional period, importers report details of both the carbon price (expressed as euros per tonne of CBAM good) and also the CBAM products covered by the price, as reported by the operators producing the CBAM goods. If the precursors originate from the EU, their embedded emissions need to be accounted for, but the carbon price already paid in the EU will also be reflected in the CBAM report. Chapter 6.10 of the Guidance lists parameters that need to be reported regarding the carbon price in the country of origin. This information will give importers a rebate in the amount otherwise due to be paid by the person liable for the CBAM obligation. If the precursors originate from outside of the EU, respective producers should communicate their embedded emissions and already-paid carbon price to the operators using those precursors. For complex goods, where relevant precursors are consumed by the production process, the carbon price due by the supplier should be added to that determined for the complex CBAM good, and the resulting carbon price calculated. If the information about the carbon price from a supplier is not provided, the assumption is that the carbon price due for the precursor is zero. The procedure for monitoring and calculating the effective carbon price should be included in the monitoring methodology documentation. Additionally, if relevant precursors from another installation are used in the production process, you also need to obtain the same information from the supplier for each precursor good supplied.

An overview of the iron and steel production processes is graphically represented in Guidance and Figure 1. Materials which are considered to have no embedded emissions are shown in red boxes, while materials with embedded emissions (relevant precursor materials and final products, i.e. goods under the CBAM) are in green boxes. Simple goods are shown in a normal font, and complex goods in bold font.

Figure 1: System boundaries and value chain for the production of iron or steel product; taken from - Guidance document on CBAM implementation for installation operators outside the EU, page 58, figure 5 – 5, EU Commission website



2.3. ALUMINIUM SECTOR

Implementing Regulation references relevant for the CBAM transitional period in Aluminium sector are:

Annex II, Section 2 Table 1 Mapping of CN codes to aggregated goods categories

Annex II, Section 3 Production routes, system boundaries, and relevant precursors, as specified in sub-sections: 3.17 – Unwrought aluminium and 3.18 – Aluminium products

All reporting units that apply to the iron and steel sector are also relevant for the aluminium sector with one important addition. Aside from CO_2, relevant GHGs for aluminium production are perfluorocarbons PFCs (CF4 and C2F6). These emissions arise from anode effects and are only relevant for primary aluminium production. According to the available information, the last facility of that sort in the Western Balkans was closed in Montenegro in May 2023, making monitoring and aluminium-related calculation of PFCs in the WB region not needed.

Similar to the iron and steel sector, during the transition period, the aluminium industry needs to document indirect emissions separately. The following table shows the aggregated goods categories that encompass both finalized products and precursor goods (intermediate products) utilized in the manufacturing of aluminium products and the relevant precursors.

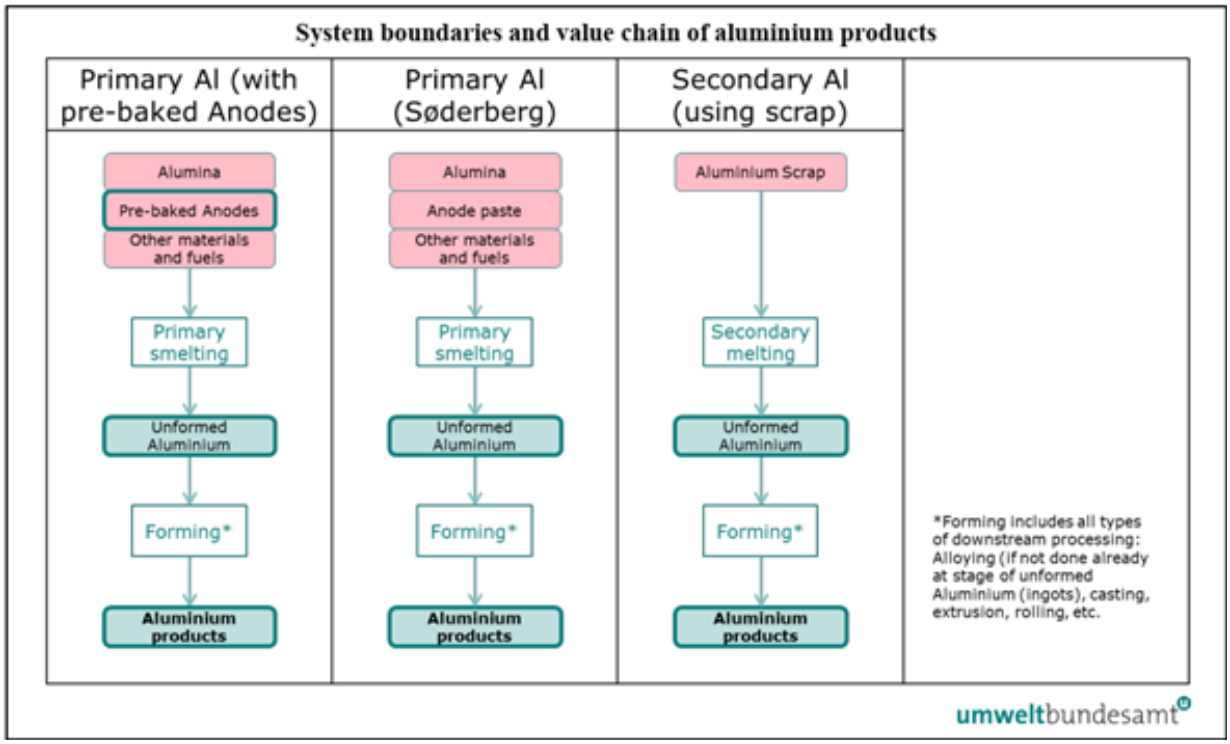
Table 2: Aluminium- aggregated goods categories, their production routes and possibly relevant precursors

Aggregated Goods Category	Relevant precursors
Unwrought aluminium (Primary aluminium, Secondary aluminium)	None for primary aluminium For secondary aluminium – unwrought aluminium from other sources, if used in the process (if the product from secondary aluminium production route contains more than 5% alloying elements, the embedded emissions of the product shall be calculated as if the mass of alloying elements were unwrought aluminium from primary smelting)
Aluminium products	Unwrought aluminium (differentiated between primary and secondary aluminium, if known), other aluminium products (if used in the production process)

The system boundaries of the precursor unwrought aluminium and of aluminium products are distinct and may, under certain conditions, be added together to include all processes directly or indirectly linked to the production processes for these goods, including input activities to, and output activities from, the process.

An overview of the aluminium production processes is graphically represented in the Guidance and Figure 2.

Figure 2: System boundaries and value chain for the production of aluminium product from - Guidance document on CBAM implementation for installation operators outside the EU, page 78., figure 5 – 14, EU Commission website



There are no PFC emissions from the secondary aluminium or aluminium products forming processes. Aluminium scrap is the main material input to the secondary melting production route. Scrap (whether pre-consumer or post-consumer) is treated as a raw material and thus has zero embedded emissions. For products that contain more than 5 % by mass of other materials, e.g. insulation materials in CN code 7611 00 00, only the mass of aluminium shall be reported as the mass of the goods produced. Also, if an installation makes a category of complex good and its precursor, and where this precursor is wholly used to make the complex good, a joint (single) production process system boundary may be defined within the installation ("bubble approach"). In addition to the aforementioned points, specific simplifications are applicable to certain sectors during the transitional period, particularly for:

- Iron and steel installations that produce two or more goods from specific product groups (sintered ore, pig iron, FeMn, FeCr, FeNi, DRI, crude steel, iron or steel products). These installations may monitor and report embedded emissions by defining a single joint production process, as long as none of the precursor materials produced are sold separately. Therefore, the "bubble approach" may be employed

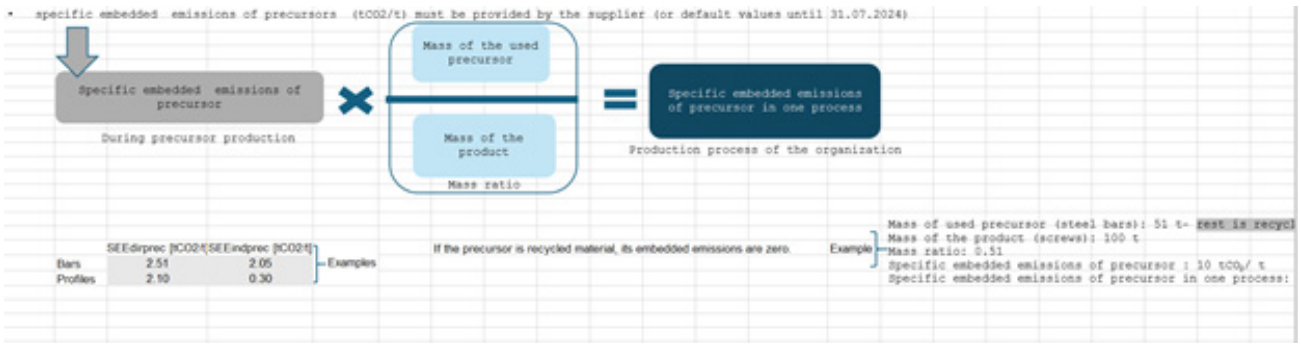
- Aluminium installations engaged in the production of two or more goods from unwrought aluminium or aluminium product groups. Similar to the iron and steel sector, these installations have the option to monitor and report embedded emissions by defining a joint production process, provided none of the precursor materials are sold separately. The utilization of the "bubble approach" is permissible in this context as well.

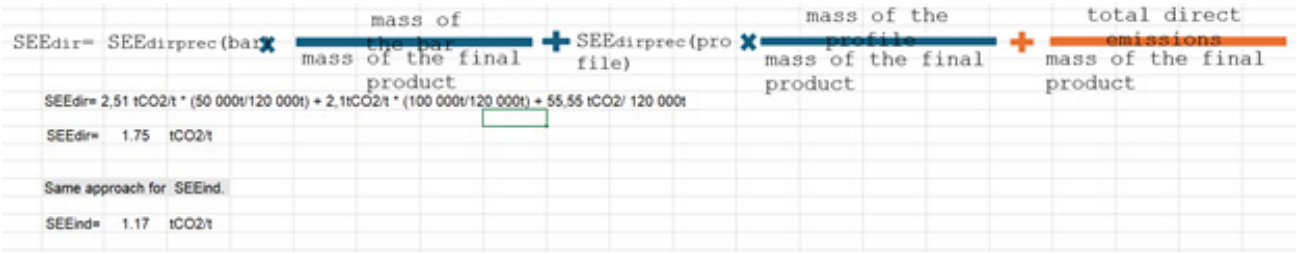
2.4. EXAMPLE OF CALCULATION:

Simplified example refers to the production of screws. Mass balance approach is used for calculation of total direct emissions. Inputs are precursors (bars and profiles) acetylene and welding wire that are used for welding and fossil fuels (lignite and natural gas) for heating and production of process heat. Outputs and final product (screws), scrap steel and slag. Choice of input and output materials and their quantities does not reflect real processes. They are only used for the sake of an example. Variable labels are in line with CBAM regulation.

Direct emissions							Indirect emissions	
Input							Consumed electrical energy [MWh]	Emission factor of BiH [tCO2e/MWh]
Source streams	Quantity [t]	CC- carbon content [%]	Net calorific value NCV [TJ/Gg]	Emission factorEF [tCO2/TJ]	Emissions [tCO2e]	Note	10,000	0.78024
Bars [t]	50,000.00	0.20			366.40			
Profiles [t]	100,000.00	0.20			732.80			
Acetylene [l]	5,000.00	92.24	48.00	70.40	0.02			
Welding wire [t]	150.00	0.07			0.38			
Natural gas [m3]	300.00		56.10	48.00	0.55			
Lignite [t]	50.00		11.90	101.00	60.10	More precise data are usually available on the national level		
Σ					1,160.25			
Output								
Final product [t]	120,000.00	0.20			879.36			
Scrap steel [t]	20,000.00	0.20			146.56			
Slag [t]	10.00	0.20			0.07328			
Lignite ash [t]	7.50	20			5.496	Assumption-15% ash in lignite and 20% CC. It has to be substantiated with evidence.		
Σ					1,031.49			
Total direct emissions [tCO2e]					128.7584		Total indirect emissions [tCO2e]	7,802.4000

The ratio of the molar masses of CO2 and C	3.664	t CO2/t C	constants
Acetylene density	1.10	kg/m3	
Natural gas density	0.68	kg/m3	





The mass balance is implemented by calculating emissions corresponding to each source stream as follows: $Em_k = f \cdot AD_k \cdot CC_k$ (Equation 12)

Where:

AD_k … activity data [t] of material k; for outputs, AD_k is negative;

f is the ratio of the molar masses of CO_2 and C: f = 3.664 t CO_2/t C, and

CC_k is the carbon content of material k (dimensionless and positive).

If the carbon content of a fuel k is calculated from an emission factor expressed in t CO_2/TJ, the following equation shall be used: $CC_k = EF_k \cdot NCV_k / f$ (Equation 13)

If the carbon content of a material or fuel k is calculated from an emission factor expressed in t CO_2/t, the following equation shall be used: $CC_k = EF_k / f$ (Equation 14)

3.1. CBAM FOR FERTILIZERS

"The inclusion of fertilizers in the EU CBAM is intended to support efforts to make production more energy efficient" (Karen Hansen-Kuhn, 2021:4)

The European Association of Fertilizer Producers expresses the fear that in the case of full application of the CBAM regulation (without additional measures - export solutions), they could end up in a distinctly unequal position compared to competition that does not apply the ETS. Namely, the further increase of ambitions through the EU ETS (to bring emissions down by 62% by 2030 compared to 2005 levels) coupled with the progressive reduction of free allowances through the CBAM mechanism, according to the analysis of this association, would lead to a drastic reduction in the competitiveness of companies that export fertilizers from the EU and, at the same time, importing products with a significantly larger carbon footprint.

The fertilizer industry, according to the existing EU ETS system, is entitled to free CO_2 allowances up to a benchmark which is taken on the basis of the best 10% of installations in this industry. For the fertilizer industry, at the moment, in the production of ammonia and nitric acid, about 80% of production is covered by free allowances, which amounts to about EUR 500 million in annual costs for the remaining production not covered by free allowances (costs calculated on the basis of an average price of EUR 80 /tCO_2) (see Fertilizers Europe, 2023).

3.2. ETS REFORM AND IMPACT ON FERTILIZER TRADE

According to the data from the International Fertilizer Society, compared to the current reference values for the top 10% of installations in the EU fertilizer industry, it is estimated that around 1.57 mt CO_2/mt NH3 produced is avoiding paying the carbon tax (see, McDonald, 2023). If we take a typical European ammonia plant that emits 1.9 mt CO_2/mt NH3 as an example, this practically means that 0.3 mt CO_2 would be above the reference value. With an average price of 80 EUR/tCO_2, and if there is no carbon tax in the country of origin, the costs of CBAM would be around 24 EUR/mt NH3 produced (see McDonald, 2023). On the other hand, at the global level, the average emission from the installation is about 2.2 mt CO_2/mt NH3. which leads to a cost of 48 EUR/mt.

Mass production of food, animal feed and biofuels are increasingly dependent on the use of sintetic fertilizers, which generate significant emissions. Nitrogen fertilizers create nitrous oxide (N2O) which is estimated to account for about 6% of global greenhouse gas emissions using carbon dioxide (CO_2) equivalents. But these emissions have a huge impact on global warming. According to the US Environmental Protection Agency, "Nitrous oxide molecules remain in the atmosphere for an average of 114 years before being removed to a sink or destroyed by chemical reactions. The impact of N2O on the global warming of the atmosphere is almost 300 times greater than that of carbon dioxide. Global N2O emissions have increased by 30% since 1980, with two-thirds of that increase coming from agriculture. Emissions from fertilizers are the result of excessive fertilizer application by farmers around the world and the production process itself, which uses significant energy from fossil fuels" (see, US EPA, 2024)).

Annual Consumption (nitrogen fertilizer nutrient, million tonnes)
(See: Sectoral Deep Dive, 2021)

EU 27	11,3
Global	107,7

No. of EU Installations covered in CBAM
(See: Sectoral Deep Dive, 2021)

Ammonia	29
Nitric acid	34

No. of plants in value chain

Fertilizer & ammonia: 173

Trade Patterns (all fertilizers) (See: Sectoral Deep Dive, 2021)

Imports as a Share of Domestic Consumption (%)	29,5%
Exports as a Share of Domestic Production (%)	21,3%

Main Sources of Fertilizer Imports (% of total imports, by value)

Russia (31,1%)	Egypt (8,8%)	Belarus (8,4%)	Algeria (7,7%)	Morocco (7,4%)

The fertilizer industry, as part of the wider chemical industry sector, has a special economic importance for the European and the world economy. Of the three key elements in fertilizers - nitrogen, phosphates, potassium - nitrogen has the greatest impact in terms of greenhouse gases and their impact on global warming, and is also the only element of these three that is included in the EU ETS. Within the ETS system, the activities for which there are benchmarks are: ammonia production and nitric acid production.

The average age of EU plants in the fertilizer industry is about 45 years old, and it can be stated that there have been no significant investments in this area in recent years. Taking into account the green transformation and climate goals by 2050, investments in this industry in the next 10 or so years will be of great importance.

3.3 CN CODES FOR FERTILIZERS

CN code	**Greenhouse gas**
2808 00 00– Nitric acid; sulphonitric acids	Carbon dioxide and nitrous oxide
2814– Ammonia, anhydrous or in aqueous solution	Carbon dioxide
2834 21 00– Nitrates of potassium	Carbon dioxide and nitrous oxide
3102– Mineral or chemical fertilizers, nitrogenous	Carbon dioxide and nitrous oxide
3105– Mineral or chemical fertilizers containing two or three of the fertilizing elements nitrogen, phosphorus and potassium; other fertilizers; 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 fertilizers containing the two fertilizing elements phosphorus and potassium	Carbon dioxide and nitrous oxide

(REGULATION (EU) 2023/956, Annex I, pp 39)

3.4. SPECIFICITIES REGARDING FERTILIZERS

In the transitional period, the Implementing Regulation 2023/1773 refers to segments dealing with issues specific to the fertilizer sector. Those are:

- Annex II Section 2, Table 1 Mapping of CN codes to aggregated goods categories
- Annex II: Section 3 Production routes, system boundaries, and relevant precursors, as specified in sub-sections: 3.7 – Ammonia; 3.8 – Nitric acid; 3.9 – Urea; 3.10 – Mixed fertilizers

Regarding fertilizer sector goods imported into the EU, the production units should be expressed in metric tonnes. Further, these quantities have to be reported separately for each type of sector goods, by an installation or production process in the country of origin. It should be noted that for certain goods, the imported quantities need to be converted to standardised tonnes. For example, for nitric acid, hydrous solutions of ammonia and nitrogen-containing fertilizers, there will be a need to explicitly state the reference concentration / nitrogen content (and form of nitrogen).

Producing chemical precursors for nitrogenous fertilizer production, producing nitrogenous fertilizers by physical mixing or chemical reaction, and processing into their final form, are seen as associated activities. The relevant greenhouse gas emissions are carbon dioxide (CO_2) and nitrous oxide (N2O).

While direct emissions are expected to be expressed in tonnes (metric) of CO_2e, indirect emissions related to the quantity of electricity consumed should be expressed in MWh, and the source and emissions factors used to calculate the indirect emissions in Tonnes (metric) of CO_2 or CO_2e. These are to be reported separately during the transitional period. Units for embedded emissions are Tonnes CO_2e emissions per tonne of goods, and should be reported separately for each type of goods, by installation in the country of origin

It should be noted that the example for the fertilizer sector given in section 7.3.2. is relevant and could be very illustrative for the operators, showing how direct and indirect specific embedded emissions (SEE) values are derived for the mixed fertilizer production process, and how the embedded emissions of imports into the EU are calculated. The finished nitrogenous fertilizer goods and chemical precursor goods (intermediate products) that are consumed in the production of fertilizer are included in the aggregated goods categories, but only input materials listed as relevant precursors to the system boundaries of the production process as specified in the Implementing Regulation are to be considered. The following Table 3 provides the possible precursors by aggregated goods category and production route.

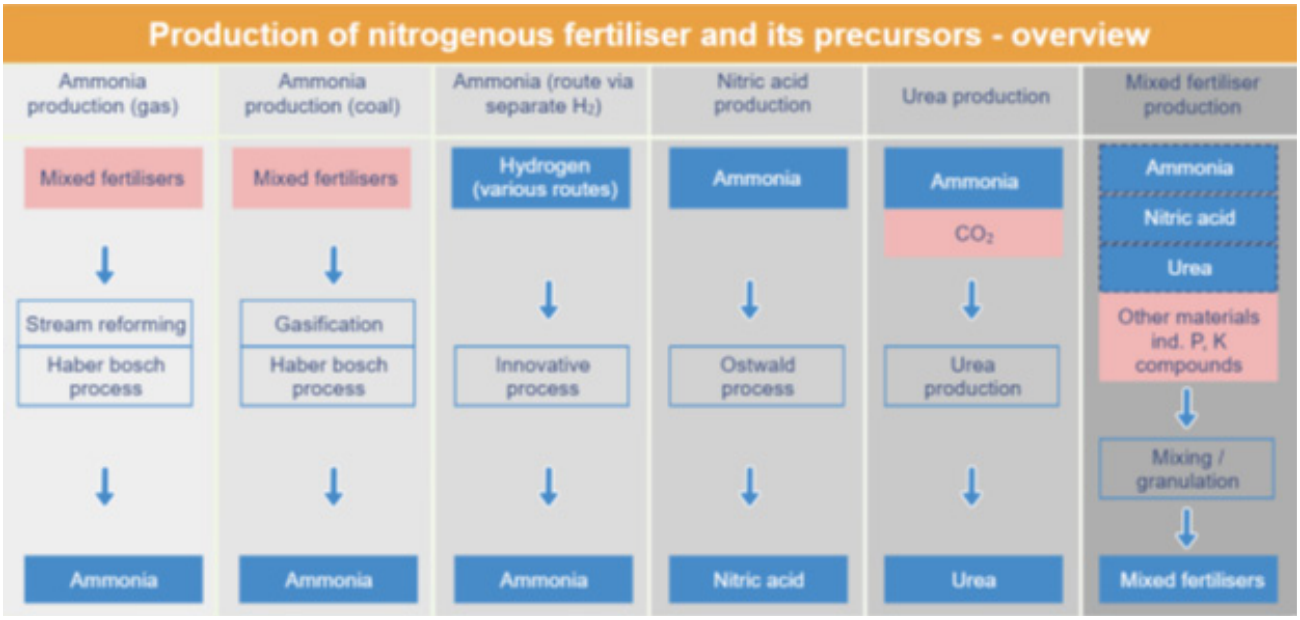
Aggregated Goods Category	**Relevant precursors**
Ammonia - Haber Bosch with steam reforming - Haber Bosch with gasification	Hydrogen, if separately produced for use in the process*
Nitric Acid	Ammonia (as 100% ammonia)
Urea	Ammonia (as 100% ammonia)
Mixed fertilizer	If used in the process: - ammonia (as 100% ammonia) - nitric acid (as 100% nitric acid) - urea, - mixed fertilizers (in particular salts containing ammonium or nitrate)

* Where hydrogen from other production routes is added to the process, it shall be treated as a precursor with its own embedded emissions

Also, in the case of mixed fertilizer itself, as an aggregated goods category, it may be used as a precursor for its own category, depending on the final formulation of the mixed fertilizer product required.

Processes and process routes for the production of nitrogenous fertilizer and its relevant precursorsare described in Figure 3

Figure 3: System boundaries and value chain for the production of nitrogenous fertilizer and its precursors – overview; from - Guidance document on CBAM implementation for installation operators outside the EU, page 48., figure 5 – 4, EU Commission website



Starting from the well-known fact that urea has a high nitrogen content, it should be noted that in addition to its use as a precursor in the production of mixed fertilizer, it may also be used as a convenient fertilizer on its own.

3.5. MONITORING AND REPORTING IN THE FERTILIZERS SECTOR

Generally, while identifying the parameters needed to be monitored for direct emissions of the installation, in the case of N2O emissions from nitric acid production, the measurement-based method is compulsory. In principle, for fertilizers, the relevant emissions that should be monitored and reported are:

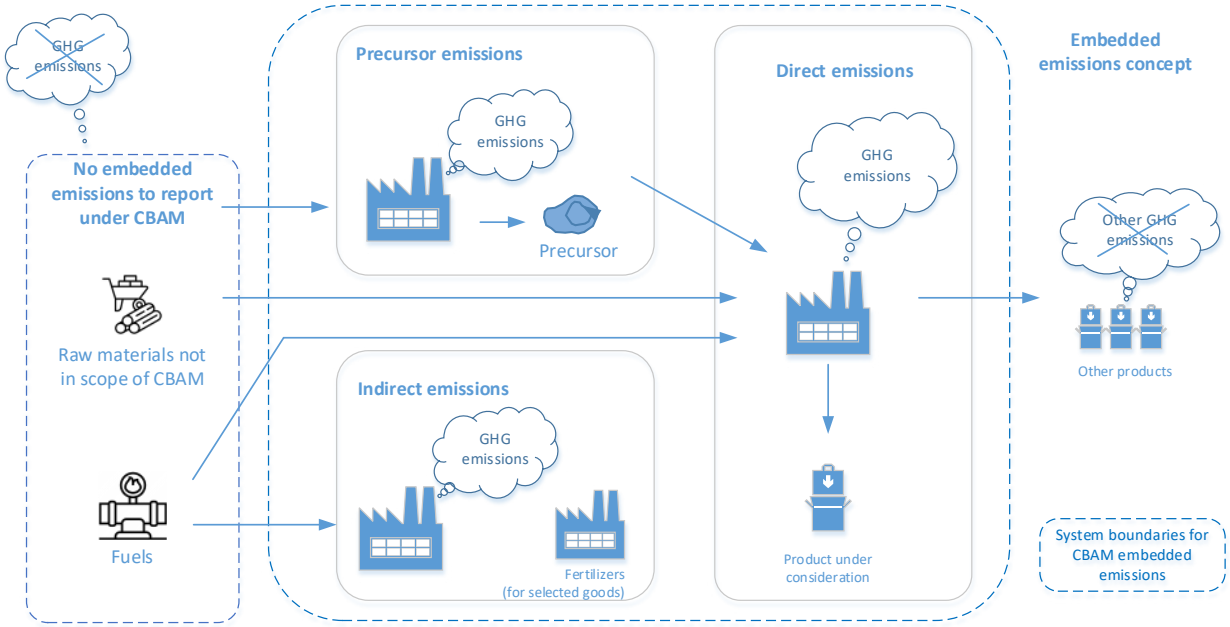
1. Carbon dioxide direct emissions from the fuel combustion process, from stationary plants only
2. Carbon dioxide and nitrous oxide (N2O) direct emissions from the process
3. Carbon dioxide direct emissions resulting from the production of measurable heating (e.g. steam) and cooling that is consumed within the system boundaries of the production process
4. Carbon dioxide direct emissions resulting from emissions control (e.g. from carbonate raw materials such as soda ash used for acidic flue gas cleaning)

Also, indirect emissions from electricity consumed have to be reported separately from direct emissions, but at the same time other N2O emissions resulting from the combustion of fuels are excluded from the system boundaries.

1. The emissions to monitor and report for the aggregated goods category "mixed fertilisers" are as follows:Direct emissions for the production of the mixed fertilisers
2. Indirect emissions linked to the electricity used in the production process
3. Direct and indirect emissions for the production of precursors used for the production of fertilisers (e.g. ammonia and nitric acid)

Note that emissions generated by the production of fuel and of raw materials that are not in the scope of CBAM are not supposed to be reported.

Figure 4: Actual specific embedded emissions for the aggregated goods category 'mixed fertilizers' (see: European Commission, 2023) (adapted from The Carbon Border Adjustment Mechanism (CBAM), fertilizers sector - Course Takeaways, European Commission, 2023)



Further, additional rules for fertilizers, such as the attribution of emissions for mixed fertilizers, measurable heat produced from exothermic chemical processes, the production of electricity, transfers of CO_2 between production processes and ameasurement-based approach for monitoring N2O emissions are described in detail in Section 7.3.1.2 of Guidance.

However, it should be pointed out that during the transitional period, and due to the complexity of production processes in the fertilizer sector, installations producing mixed fertilizers may simplify the monitoring of the respective production process by determining one uniform value of embedded emissions per tonne of nitrogen contained in the mixed fertilizers, irrespective of the chemical form of nitrogen (ammonium, nitrate or urea forms).

At the same time, in emissions data communication between operator and importer, there are additional reporting requirements, presented in Table 4

Table 4: Additional fertilizer sector parameters requested in the CBAM report

Aggregated Goods Category	**Reporting requirement in the quarterly report**
Ammonia	Concentration, if hydrous solution
Nitric Acid	Concentration (mass %)
Urea	Purity (mass % urea contained, % N contained)
Mixed fertilizer	Content of different forms of nitrogen in mixed fertilizer: - Content of N as ammonium (NH4+); - Content of N as nitrate (NO3–); - Content of N as Urea; - Content of N in other (organic) forms

Resume: Calculating the specific embedded emissions in the fertilizer sector

Specific embedded emissions in the fertilizers sector are calculated via this formula:

$$\text{Specific embedded emissions} = \frac{\text{(Total } CO_2 \text{ Emissions from Fertilizers Production)}}{\text{(Total Fertilizers Production)}}$$

where,

Total CO_2 Emissions from fertilizer production represents the sum of carbon dioxide (CO_2) emissions released during the entire fertilizer production process in tonnes and it encompasses both direct and indirect emissions

Total Fertilizer production refers to the overall amount of fertilizer produced within a specific timeframe (usually measured in tonnes) and represents the total quantity of fertilizer manufactured during that period

The result, the specific embedded emissions, represents the amount of CO_2 emitted per unit of fertilizers produced.

3.6 CASE STUDIES

Case study of Egyptian companies

Egyptian companies are currently developing their carbon footprint and have received reporting templates from their exporting agents. They are also assessing the various decarbonization measures: energy efficiency, capturing CO_2 in urea, melamine or soda ash and the partial replacement of NG with green hydrogen (see Elshishini S, 2024).

A number of decarbonization options have been proposed for the fertilizer industry:

- Implementing energy efficiency projects such as hydrogen recovery from purge gas, minimizing steam losses, increasing efficiency of generator, boiler and furnace, all of which can reduce fuel consumption by about 2.00-3.00%. Ammonia embedded emissions will be reduced from 1.62 to 1.58 t CO_2/t NH3
- Reaching the BAT benchmark for process emissions (1.24 t CO_2/t NH3) by maximizing ammonia production through replacement of catalysts to increase conversion efficiency, recovering amonia from purge gas, and optimizing operating conditions in reactors. Total emissions will be reduced from 1.62 to 1.42 t CO_2/t NH3 (see Elshishini S, 2024)

• The impact of replacing 15.00% of hydrogen used for ammonia synthesis by green hydrogen can be calculated as follows: Each kg of grey ammonia requires 4.5 kg NG (NREL, 2009) and a reduction of 15.00% of grey hydrogen will reduce requires NG by 15.00%=4.5×0.15=0.675 t NG corresponding to a CO2 reduction of 0.25 t CO2/t NH3 causing a reduction in CO2 embedded emissions from 1.62 to 1.37 t CO2/t NH3 (see Elshishini S, 2024).

By applying all three measures, the **ammonia embedded emissions will become 0.92 t CO2/t NH3.**

Case study of ammonia production plant

A Haber-Bosch ammonia production plant, designed and optimized with traditional features, consumes approximately 7.9 kWh.kg-1 from fossil fuels. However, as the ammonia production capacity decreases, this production value does not decrease linearly, and energy consumption is expected to be higher due to increased heat losses. In ammonia synthesis by the electrochemical method, the amount of energy required for the electrolysis of water varies between 54 kWh and 44.7kWh per kg H2, and its value corresponding to 1 kg ammonia production varies between 9.9 kWh and 11.5 kWh. If the Hydrogen produced in the process is produced through a solid oxide electrolysis cell that uses the heat of the process, the amount of energy needed will likely be even less (see A.E. Yüzbasıoglu et al., 2021).

Currently, the biggest cost share in ammonia production with the Haber-Bosch process is the amount of raw materials and energy used. While energy production costs are constantly changing in today's conditions, the approximate cost of Haber-Bosch production process for hydrogen production from fossil fuels is $90 per 1 ton of ammonia, while the cost of hydrogen production by electrochemical method is $232 for 1 ton of ammonia. However, with the rapid decline in renewable energy prices, the difference between renewable energy sources and energy production from fossil fuels will decrease while the importance of capital costs will increase (see A.E. Yüzbasıoglu et al., 2021).

4.1. CBAM and the cement industry

Production of Portland cement is a complex technological process that consists of two basic steps. In the first step, through heat processing, raw materials are fundamentally altered creating cement clinker. In the second step, by grinding and milling clinker with gypsum, the final product - cement - is manufactured.

The general technological scheme of the production of Portland cement, which includes processes with raw materials and the final product consist of the following eight phases:

- extraction of raw materials used in cement production
- preparation of raw materials (including grinding and mixing)
- warehousing of meal
- baking of raw material meal (production of clinker)
- maturing of clinker
- milling of clinker into cement
- warehousing of cement
- packing and dispatch

Raw materials:

The basic raw materials used to prepare the mixture which through baking converts into clinker are:

- raw materials of carbonate character (limestone and some kinds of marl with a high content of CaCO3)
- raw materials of an acid character (clays, shales, marl clay, tuff, pozzolana and others)

Corrective raw materials, whose basic role is to improve the chemical composition of the mixture, are:

- raw materials of a silicate character (quartz sand, tuff and other mineral materials of natural or synthetic origin)
- raw materials with a high content of iron oxides (pyrite burns) and similar

Raw materials that are mixed with clinker in the process of obtaining the final product include gypsum and additives such as natural and synthetic pozzolana, blast furnace slag, limestone and others.

4.2. ALTERNATIVE RAW MATERIALS

The use of alternative raw materials such as blast furnace slag, fly ash from thermal power plants, silica fume and others in the process of production of clinker for cement have a significant positive impact on environmental protection, and consequently, overall CBAM related balances. The gathering of these materials on the soil creates air pollution while gathering in lakes and other fluid flows releases toxic materials that are normally present in small quantities. A particularly convenient circumstance is the fact that heavy metals contained in cement are barely released from finalized cement products – concrete and gypsum.

The use of alternative raw materials in clinker production, or as a substitute for a portion of clinker in cement, reduces the consumption of natural non-renewable energy sources and emissions of CO_2 (caused by the reaction of de-carbonation from raw materials and burning of fuel). Each procedure of reduction of the amount of clinker in cement leads to the saving of raw materials and fuel, and further causes reductions of CO_2 emissions into the atmosphere in equal percentage.

The process of cement clinker production is performed in a broad temperature band and includes a number of processes and reactions of decomposition and synthesis. In a temperature range of 50-900°C water is extracted. Warming of the raw material mixture from 50-100°C causes mechanically linked water to evaporate, while chemically linked water evaporates in the range from 100-300°C. At temperatures above 200°C, processes of dehydration are carried out (a chemical reaction that results in the loss of water from molecules) as well as dehydroxylation (a chemical reaction that results from the separation of hydroxyl - OH group from organic compounds) of clay substances. The temperature processes of dehydration and dehydroxylation depend on the kind of clay minerals contained in the raw material mixture. At temperatures of 900-1100°C, a process of thermal dissociation of carbonates is carried out with the decomposition of limestone (CaCO3), dolomite (CaCO3 x MgCO3) or magnesite (MgCO3). In the temperature range of 1000-1200°C, the first reactions between the CaO in limestone and acid oxides in clay (SiO2, Al2O3 and Fe2O3) begin, resulting in the reaction of the creation of clinker mineral and of the final product - cement clinker. This reaction of creation or synthesis of clinker mineral, due to the presence of mineralizers and flux starts already above 700°C. It has thereby been proven that:

- Even below 800°C it is possible to create CaO x Al2O3 and CaO x Fe2O3 or CF
- Between 800-900°C begins the process of creation of CaO x SiO2 or CS, which transforms at around 1000°C into compounds with a higher content of CaO
- Between 900-950°C merging occurs between 5CaO x 3Al2O3 or C5A3 that is C12A7 which as such may be found in the final product
- Between 950-1200°C the creation of 2CaO x SiO2 or C2S begins, which is also found in the final product
- Between 1200-1300°C the creation of 3CaO x Al2O3 or C3A begins, which probably passes into the aluminoferrite phase 4CaO x Al2Os x Fe2O3 or C4AF
- Between 1200-1450°C the sintering phase initiates the creation of 3CaO x SiO2 or C3S as the main and basic clinker mineral

In the sintering zone, that is at temperatures of 1450°C or higher, a state of balance is established. The permanent maintaining of this stage is achieved by sudden, and as rapid as possible, cooling, particularly in the interval between 1450 and 1250°C. After cooling, which conserves its mineral content, clinker is stored in specialised warehouses. It stays there for a period of time before milling in order to free lime (CaO free) which may have remained through the reaction with moisture and CO_2 from air.

4.3. FINAL PHASE OF THE PRODUCTION OF CEMENT

The final product - Portland cement - is obtained by milling clinker with 2-4% gypsum in steel bearing mills. Gypsum is added in order to regulate the setting time of the cement obtained. In the milling process, apart from gypsum, other additives may be added to clinker, such as granulated blast furnace slag, natural and industrial pozzolana, limestone and other materials that is done in the production of cement with additives. Globally viewed, today more than 1,000 cement producers carry out the production process in over 2,300 cement factories and over 600 clinker milling plants. Almost three quarters of the world's cement production is carried out in five countries, where China leads with a share of 53 percent, followed by India (320 million tons) with a share of 7%, Vietnam (96.5 million tons) with a share of 2%, the United States of America (88.9 million tons) with a share of 2%, and Indonesia (64.2 million tons) with a share of 1%.

Fueled by economic growth, urbanization and population growth, cement and concrete consumption is expected to gradually recover, particularly in emerging markets. The industry's biggest challenges and opportunities are the long-term ones, more specifically, companies need to prioritize sustainability and raise their environmental standards in order to survive and thrive. Governments, investors and the general public are increasingly encouraging companies to reduce their carbon footprint. Cement plants that prioritize sustainability even during this tough period are likely to emerge victorious in the next cycle. Many companies are already taking significant steps towards decarbonization.

The cement sector was selected in the CBAM context according to specific criteria, especially according to the high risk of carbon "leakage" and the high emission intensity, particularly in cement plants in the Western Balkans. Concrete is the most used construction material, and the production of its main ingredient, cement, is responsible for about 7% of CO_2 emissions in the world. The first step in the decarbonization of cement production is the introduction of a package of technological solutions that will lead to the reduction of CO_2 emissions and especially the use of renewable energy sources, as well as the use of CO2 collection and storage technology.

The cement industry in certain economies of the region is working hard to change the national regulatory framework that governs the import of waste, i.e. to ensure the possibility of using alternative fuels from the EU market and a faster transition from a linear to a circular economy with low-carbon products. This would reduce dependence on fossil fuels and other emissions emitted by fossil fuels. In the region, the situation is equally complex, and all cement plants face the same challenges because the obligation to pay fees for CO_2 emissions in the future would seriously threaten the competitiveness of the cement industry.

4.4. CBAM REPORTING FOR CEMENT IN FOUR STEPS

In terms of the formal obligations of the cement industry in applying the CBAM mechanism, they are explained in several concrete steps, as follows:

Step 1

If you are exporting your product to customers in the European Union then check the commodity codes for cement products under CBAM

CN code	Category of aggregated products	GHG emissions
CEMENT		
2507 00 80 - other kaolinic clays	Kaolinic clay	
2523 21 00 - Cement clinkers	Cement clinker	
2523 21 00 - White Portland cement, whether or not artificially coloured	CEMENT	
2523 29 00 - Other Portland cement	CEMENT	
2523 90 00 - Other hydraulic cement	CEMENT	
2523 30 00 - Aluminous cement	Aluminous cement	

In order to limit the GHG emissions of cement, alternative cement compositions can be used. While “Portland cement” (PC, clinker mixed with max. 5% gypsum) remains the reference, standards have evolved to include higher proportions of additives or supplementary cementitious materials (SCM), such as fly ash, blast furnace slag or pozzolanic materials. Most of these SCMs have no emissions associated with their production. Clay, however, requires heat treatment to increase reactivity, so calcined clay SCMs are of interest for cement-related greenhouse gas emissions. These alternative cements, hereinafter referred to as “other hydraulic cements”, are defined by their clinker-cement ratio. A lower clinker to cement ratio requires less (GHG intensive) clinker and is therefore associated with less GHG intensive cement. In practical terms, the GHG intensity of cement is thus the GHG intensity of the clinker multiplied by the clinker to cement ratio, potentially adding emissions associated with the thermal processing of the clay. For instance, the emission intensity of Portland cement class CEM I is at least 95% of the emission intensity of clinker, while blended cement CEM II/A-K is made of 94% Portland clinker and 6% calcined clay. Its emission intensity is 94% – clinker emission intensity plus 6% calcined clay emission intensity.

Step 2/ Establish a CBAM corporate team (responsible for production, supply, commercial, finance, HSE, quality...) and determine the methodology for monitoring each parameter and develop a Methodology Document

1. CBAM emissions (direct from fuel and materials and indirect generated in the production process + consumed electricity)
2. Production data on the plant - description
3. Describe the production process - the limits of the production process
4. Define the limits of plant
5. Define the limits of production processes
6. Identify source streams for calculation methods (consumed input material...)
7. Identify sources of emissions for measurement methods (measure gases on the chimney, gas flow, emissions...)
8. If calculation and measurement methods are not applied in the first three quarterly reports, default values can be used

Step 3
CBAM Declaration includes the following:

- total amount of goods imported during the previous quarter
- total embedded direct and indirect emissions

In terms of direct emissions for clinker production the following should be underlined: For process emissions, within direct emissions, we use a value of 525 CO2/t of clinker for all countries, in accordance with the value reported in the CBAM Implementing Regulation (European Commission, 2023).

Fuel emissions:

In order for calcination (and other thermal operations) to take place, different fuels are combusted. Emissions from fuel combustion are therefore the sum of greenhouse gas emissions from each fuel and fuel mixture. This value takes into account the emission factors of the fuels used (i.e. how much CO2 is produced per amount of energy released for each fuel of the mixture), the composition of the fuel mixture (i.e. the proportion of fuel used or how much each fuel is used as a percentage of the total energy used) and the total thermal energy used.

Cement:

Products within CBAM include clinker, but also different types of cement. These cements are produced by mixing clinker with additives. Cement emissions are the sum of emissions of its ingredients, clinker and calcined clay, precursors with GHG.

Indirect emissions

Emissions related to the consumption of electricity ensure the calculation of indirect emissions. For each country/region – as discussed above - there are relevant indicators for the definition of emissions related to electricity. And you can request the emission factor for every single economy from the International Energy Agency (IEA).

Nevertheless, it should be underlined that the carbon content of the clay is not taken into account because the clays may have different compositions (i.e. with unknown carbonate content) and the carbonate may not break down through the calcination process. As to indirect emissions, it is worth noting that the values already include the grinding of calcined clay. There are no calculated emissions for trade in precursors, because precursors are not taken into account for the production of calcined clay, and production data for this commodity are missing.

Step 4/ Practical Instructions

- Think about the core of this – consider the potential financial impact of CBAM based on various costs (including non-acting) as well as potential opportunities/benefits for products with less carbon than the industry average
- Examine your supply chain –identify potential linkages with CBAM
- Prepare for reporting - although reports are submitted by declarants (importers), all data for completing the CBAM report will have to be provided by manufacturers. Determine data availability and reliability. Review GHG emissions calculations, processes and IT systems
- Keep track of the development process - with CBAM range, carbon prices, carbon prices in third countries
- Adopt long-term decarbonisation strategies – consider gradual reductions and transitions to cleaner technology in several months
- The European Commission may review your CBAM reports to assess compliance with reporting obligations and provide an indicative assessment to the competent authority in the EU Member State where the reporting declarant is established
- Competent authorities evaluate CBAM reports based on the submitted information and initiate correction due to incomplete, inaccurate reports and/or non-submission

4.5. DECARBONIZATION IN THE CEMENT INDUSTRY

In order to achieve the reduction of CO_2 emissions, it is necessary to build an ecosystem of coordinated and measured tools. There is no simple solution or one innovative technology, the application of which could suddenly reduce emissions in the cement industry sector. It is necessary to mix knowledge, technologies, investments and capital, as well as a good regulatory framework in order to succeed in decarbonisation. The cement industry has been working actively, and for a long time, to reduce CO_2 emissions. In 2013, the European Cement Association (hereinafter: CEMBUREAU) created a Road Map, thus setting up the goal of reducing CO_2 from the cement production process by up to 80% by 2050, compared to CO_2 emissions from 1990. In 2018, the road map was supplemented with the "5C approach" *(clinker - cement - concrete - construction - (re)carbonation),* which promotes a systemic cooperation along the value chain: clinker-cement-concrete-construction-(re)carbonation, which includes all actors to make the vision of low carbon emissions a reality. With the publication of the European Green Deal and its set goal of carbon neutrality by 2050, the CEMBUREAU members have introduced a new medium-term target to achieve a 30% gross reduction in CO_2 emissions for cement by 2030 and a 40% gross reduction in the entire value chain, compared with CO_2 emissions from 1990.

Research, practice and experience of cement producers testify that by joint implementation of activities, grouped in five basic directions, it is possible to achieve the established goals of reducing CO_2 emissions. Portland-composite cement with reduced clinker content consists of Portland cement clinker whose share ranges from 50% to 64% and one or more added main ingredients, which comply with the requirements of the SRPS EN 197-1:2013 standard, in a total sum of 36% to 50%. In addition, a big challenge for the cement industry in the Western Balkan 6, but also an opportunity, is to reduce CO_2 emissions by optimizing the share of clinker in cement by reusing construction and demolition waste.

Construction and demolition waste is defined as waste generated during construction projects on construction sites or preparatory works that precede the construction of buildings, as well as waste generated as a result of the demolition or reconstruction of buildings. For example in Serbia, according to data available on the Eurostat website, 729,118 tons of waste were generated in the construction sector in 2020, of which 509,370 tons belong to the mineral fraction of construction and demolition waste. However, it is estimated that the largest part of waste in construction is excavated soil (about 75%), followed by construction and demolition waste such as ceramics, concrete, and iron.

As for decarbonisation, the possibility of adding construction and demolition waste to cement as a main or secondary additional ingredient is of great importance. The European Committee for Standardization has initiated the development of the standard EN 197-6, Cement - Part 6: Cement with recycled construction materials, which specifies the requirements for cements with recycled construction materials, more precisely, ground recycled concrete, specially selected and prepared mineral materials originating from plants that produce recycled aggregate for concrete.

The EN 197-6 standard was adopted and published in 2023. In addition to the new type of cement, which, in addition to clinker, will be able to contain 6% - 20% of ground recycled concrete as the main additional ingredient, this standard also plans the possibility of adding the same amount of ground recycled concrete (6% - 20%) to cement covered by EN 197- 1 and EN 197-5 standards.

In addition, international and national projects are widely underway, which, besides ground recycled concrete, explore the possibilities of using other materials as main or secondary additions to cement, such as: activated clay and SiO, waste pozzolanic materials and waste slag from other industries.

New types of cement with reduced clinker content can make a significant contribution to reducing CO_2 emissions. Differences in the environmental burden of CO_2 emissions originating from cement with different proportions of clinker. For example, Portland cement produced in Serbia, with additives up to 20% (CEM II/A) and up to 35% (CEM II/B) reduce the environmental load with CO_2 emissions by more than 10% and 20%, respectively, compared to Portland cement without additives (CEM I), while new types of low-carbon cements (CEM II/C) reduce that load by almost 50%.

CEMBUREAU also warns that further decarbonisation of the European cement industry will be significantly affected by the availability of alternative materials, such as fly ash and granulated blast furnace slag. In addition, the limited availability of activated (calcined) clay in Europe sets an additional limit for further reduction of the clinker content in cement, compared to other parts of the world that have not yet committed to a consistent decarbonisation path. CEMBUREAU estimates that there is a possibility to reduce the ratio of clinker to cement at the European level to 74% by 2030, or to 65% by 2050 which would lead to an additional reduction of CO_2 emissions of at least 4%.

Population and economic growth are putting additional pressure on already limited resources and require continued efforts to mitigate the effects of climate change. Cement, as an indispensable and key ingredient of concrete, will play a very important role in future resource management and in providing solutions for the increasing number of inhabitants and urbanization. On the other hand,

the cement industry, as a large consumer of energy and raw materials, as well as an emitter of significant amounts of CO_2 , will *de facto* reduce CO_2 emissions as well by applying appropriate measures to reduce energy consumption and improve efficiency in the use of resources.

In order to reduce CO_2 emissions, it is necessary to act jointly in several parallel directions. It is necessary to continue working on established initiatives and determining the right combination of technologies, processes and investments that will achieve this difference, i.e. reduction in the future.

In this sense, the possibility of reducing CO_2 emissions **in cement factories in the Western Balkan Six depends on the availability of alternative materials that can be used to replace clinker.**

The two most commonly used main additional ingredients that can replace clinker are granulated blast furnace slag (mainly for the production of Portland composite cement CEM II/A and CEM II/V, metallurgical CEM III and composite CEM V cement), and fly ash (for the production of CEM II, CEM IV and CEM V cement). The availability of granulated blast furnace slag depends on the location and output material of the blast furnaces for the production of pig iron in the steel sector, while the use of fly ash primarily depends on the availability of supply from thermal power plants at a sufficiently close distance from the factory. Another critical factor in decarbonisation is insufficient knowledge and good practices. It is also necessary to build a market for secondary-recycled concrete to complete the entire ecosystem from demolition to reuse. We need support and promotion of the use of composite cements. Through awareness-raising campaigns, industry training and education, we can positively impact the acceptance of low-carbon cement and its wider use. Although a significant part of cement production is not exposed to cross-border competition, it is crucial that CO_2 emission taxing mechanisms are linked to measures that ensure that local low-carbon cement production remains competitive in relation to the imports of high-carbon cement. Increasing and adapting green public procurement tools and policies to limit the use of cement with a high carbon footprint or to limit the average carbon footprint of cement, since for every percent reduction in the clinker share, 8 to 9 tons of CO_2 are saved per ton of cement. Providing support and access to funds to finance research and development, bearing in mind that the industry's strong focus on new types of cement and concrete has the potential to respond to the demands for low-carbon and sustainable production and construction that take into account the efficient use of resources.

5.1. CONCLUSION AND RECOMMENDATIONS

The CBAM regulation brings about substantial challenges to the WB6 economies. As discussed above in great detail, the most imminent and direct challenge is related to the calculation and measurement of the embedded emissions for companies producing simple or complex goods defined in Annex I of the Regulation. Nevertheless, the reporting is just a beginning of the more complex and long term challenge: namely, competitiveness of the WB6 economies on the EU market is at stake, in light of the unfavorable carbon balances for numerous companies, due to the relatively obsolete technologies but also unfavorable energy mixes of several regional economies. These challenges should be taken seriously, contextualized geo-economically and addressed strategically through national plans for decarbonization not only in the electro-energy sector, but also in the real sector.

According to the study "Trade and Climate Change Quantitative Assessment of the Best Policy Tools to Achieve Climate Neutrality and Competitiveness", by the French Association of Large Companies from 2022, the greatest global exposure to the effect of carbon "leakage" will be on the chemical industry (35%), the metal industry (33%), the cement industry (14%) and air transport (12%) due to the expected relocation of production to Russia (22%), USA (11%), China (9%) and India (9%). Therefore, the conclusion of this study is that it is the key responsibility of national governments in the EU to create an optimal mix of appropriate policies in order to prevent the risks of further adverse consequences of climate change, where the Carbon Border Adjustment Mechanism (EU CBAM) is certainly one of the leading measures.

Also, UNCTAD points out in its report that the introduction of CBAM could lead to a decrease in exports in developing countries, which would, at the same time, be a benefit to developed countries, which have production practices with lower carbon emissions. At the same time, the recommendation that can be seen in this report refers to the need to develop supporting EU policies for CBAM, by directing the revenues from CBAM to the adoption of clean technologies in developing countries, and this would additionally contribute to the general greening of the economy and fairer relations on the global market. Nevertheless, it is not unrealistic to expect that the application of the CBAM mechanism will lead to an increased administrative burden in terms of trade in products subject to this regulation. This primarily refers to the burden on the importer in terms of proving the level of embedded emissions in the products, as well as (if applicable)

proving the carbon price paid in the country of origin. This can, for producers from non-EU countries, lead to significant technical and administrative obstacles in the placement of goods and disruptions on the EU market.

For example, if dozens or hundreds of EU companies (CBAM declarants) import fertilizers from China which has its own national ETS system, each of them will have to explain to their national CBAM authorities the nature of the link between the Chinese and EU ETS systems and how it affects the payment proposed by the CBAM regulation. Additionally, for exporting companies in the EU, in countries that do not have their own ETS, the procedure for placing goods is complicated if they measure and calculate emissions with one methodology for the CBAM report, and another for reporting on their non-financial operations, etc.

It should be underlined that several consultancy agencies have already sent advice to EU based companies to re-consider their supply chain in context of the CBAM, and in particular to already start pricing-in carbon costs coming from their supply chains after the transitional period. A study done by GermanWatch and EmissionTradingExtra (Allert, Larina & Glasser, 2023) has demonstrated that all WB6 economies will be affected with the CBAM. Most likely, Albania and Kosovo will be affected the least and Bosnia and Herzegovina and Montenegro the most. Bosnia and Herzegovina is in a challenging position in particular, due to the significant export of cement, iron, steel and electricity to the EU, combined with an unfavorable energy mix of approximately 60% of electricity coming from coal power plants. Serbia is in a similar situation, with an even worse energy mix of approximately 65% of electricity coming from coal power plants but also less electricity being exported to the EU.

It is without any doubt that the CBAM regulation will affect the existing structure of the global supply chain. Namely, once the CO_2 emissions are monetized after the transitional period in 2026, certain companies or maybe even regions will be affected in terms of their competitiveness. As the E & Y study states:

“The impact of CBAM on non-EU countries will vary depending on their trade patterns and carbon pricing policies. Countries that export carbon-intensive goods to the EU will be the most affected. The potential for CBAM-like policies to emerge globally makes it crucial for tax leaders to stay informed and adapt their strategies accordingly. Given that the EU CBAM provides credits for home country carbon pricing, successful strategies may include the establishment of carbon pricing systems. With the rise of carbon pricing in more and more countries, by way of

Emission Trading Systems, carbon taxes and Border Adjustment Mechanisms, the pressure to decarbonize increases as regulatory costs from carbon pricing will severely impact the competitive position of emission-heavy products" (2023).

While every single company affected by the CBAM should be analyzed individually, we deem it important to offer the following general advice:

- Do not allow the whole CBAM challenge to be dealt with by only one person in a company. Namely, it requires a multidisciplinary team and cross-sectoral expertize, including professionals with backgrounds in engineering, law and economics.
- Even if your partner company from the EU has not informed you of CBAM, or hasn't required from you any reporting, be proactive and explore whether you should report or not. The best way to start is to compare the list of CN codes on the list mentioned above with the CN codes of your products.
- If you have in your supply chain certain products which are on the CN codes list, then you must ask your supplier to provide you with all necessary data.
- Be aware that reporting regarding CBAM is just the beginning of the much bigger challenge – keeping competitiveness on the EU market once the emissions are paid for. So, be ready for the next substantial challenge: decarbonization. Therefore, you must not only report properly and accurately about your embedded emissions but also reduce them in your production processes and along your supply chain.
- Be aware that, starting from 2026, CBAM will cause changes to the EU market, predominantly through changes in the supply chain. Companies have already started pricing in CBAM and therefore will not hesitate to adapt or change their supply chain accordingly.
- Review your production processes and the list of parameters and data that are currently collected, monitored, measured and recorded;
- Review the entire chain of suppliers of raw materials (precursors) in order to facilitate monitoring and determination of embedded emissions in the final exported product;

- Contact all key suppliers of raw materials (precursors) as soon as possible and inform them of the need to provide you with data on emissions incorporated into their products;
- Give priority to obtaining supplier-specific emissions data for your largest precursor input materials;
- Pay attention to the method of data collection and their quality, as well as monitoring and evaluation;

APPENDIX I

Survey regarding decarbonization and CBAM among local companies

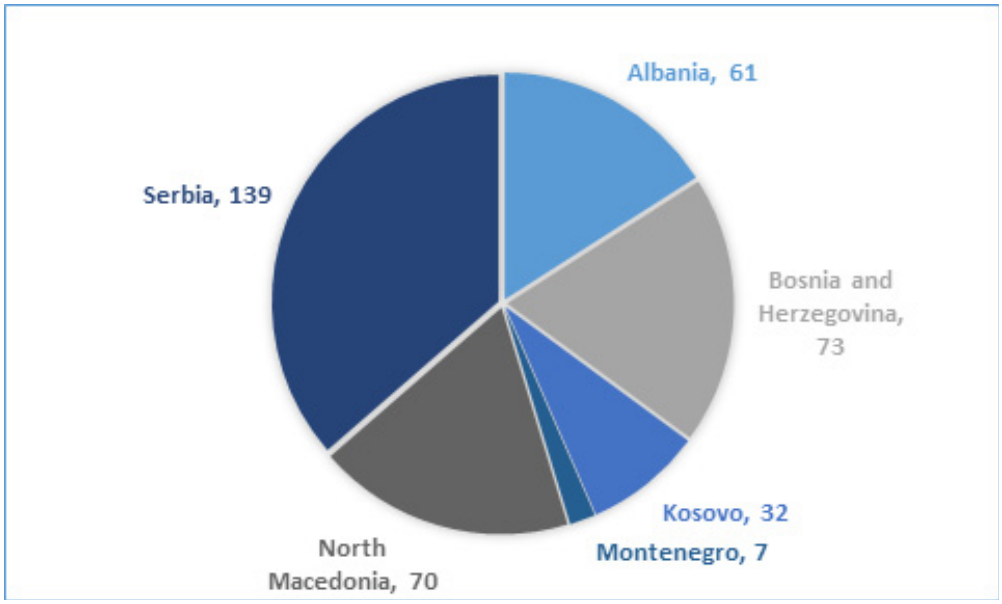
General information on the survey and the companies covered

To analyse perceptions, attitudes, and views on decarbonisation, the CBAM, and the cooperation between local and foreign companies operating in the Western Balkans, a survey was conducted in May-June 2024 by the members of the Western Balkans 6 Chamber Investment Forum. This includes the Union of Chambers of Commerce and Industry of Albania, Foreign Trade Chamber of Bosnia and Herzegovina, Kosovo Chamber of Commerce, Chamber of Economy of Montenegro, Economic Chamber of North Macedonia, and the Chamber of Commerce and Industry of Serbia.

The survey was based on a questionnaire designed specifically for this project, consisting of 25 questions organized into four groups: general information about the company, decarbonisation, CBAM, and cooperation with foreign companies. The exact questions are presented in Appendix 2. Below, we briefly present the main findings.

In total, 382 companies responded to the survey: 139 from Serbia, 73 from Bosnia and Herzegovina, 70 from North Macedonia, 61 from Albania, 32 from Kosovo, and 7 from Montenegro (Figure 1).

Figure 1 – Number of survey responses in each of the economies



Source: Survey conducted among local companies from WB.

Most of the companies are from the manufacturing sector (36%), though there are some differences among the economies. In Albania, the majority of companies are from the construction sector (15%), while in Montenegro, wholesale and retail trade dominates (43%). In Bosnia and Herzegovina, the share of manufacturing companies is notably high at 82% (Table 1).

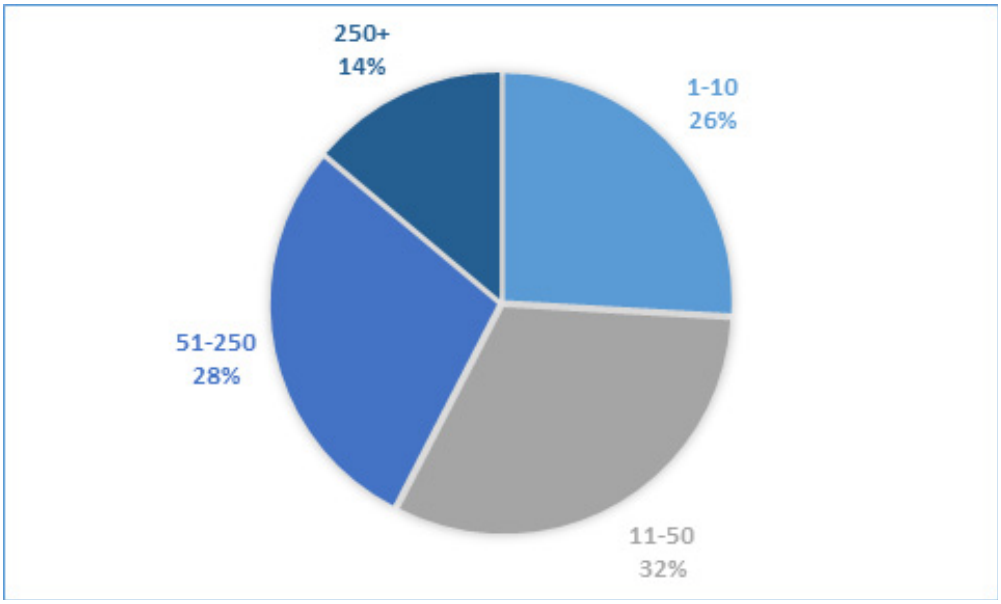
Table 1 / Distribution of companies by sector of activity

NACE sector of activity of firms	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
Accommodation and Food Service Activities	8%	0%	3%	0%	0%	2%	2%
Agriculture, Forestry and Fishing	10%	1%	0%	14%	3%	9%	6%
Construction	15%	0%	13%	0%	7%	9%	8%
Education	2%	0%	0%	0%	0%	0%	0%
Electricity, Gas, Steam and Air Conditioning Supply	8%	0%	0%	0%	7%	2%	3%
Financial and Insurance Activities	8%	0%	3%	0%	1%	1%	2%
Health and social work activities	2%	0%	0%	0%	1%	0%	1%
Information and Communication	3%	1%	0%	0%	3%	0%	1%
Manufacturing	11%	82%	41%	14%	29%	25%	36%
Mining and Quarrying	8%	1%	3%	14%	3%	3%	4%
Professional, scientific and technical activities	7%	0%	9%	0%	1%	2%	3%
Transportation and Storage	8%	0%	0%	0%	0%	5%	3%
Water Supply; Sewerage, Waste Management and Remediation Activities	5%	0%	0%	0%	1%	4%	2%
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	5%	1%	6%	43%	4%	12%	7%
Other	0%	12%	22%	14%	39%	25%	21%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Most of the companies that answered the survey were small, with 11-50 employees (32%). Medium-sized companies, with 51-250 employees, made up 28%, while 26% of the firms were micro (1-10 employees). Approximately 14% of the companies were large, with more than 250 employees (Figure 2).

Figure 2 – Distribution of companies by size, for the whole sample



Source: Survey conducted among local companies from WB.

There were some differences in size distribution among the six economies. In Albania, Kosovo, and Montenegro, the responses primarily came from micro and small enterprises. In Serbia, most responses were from small and medium enterprises. In Bosnia and Herzegovina, the majority of responses were from medium enterprises, while in North Macedonia, the sample was biased towards medium and large enterprises (Table 1).

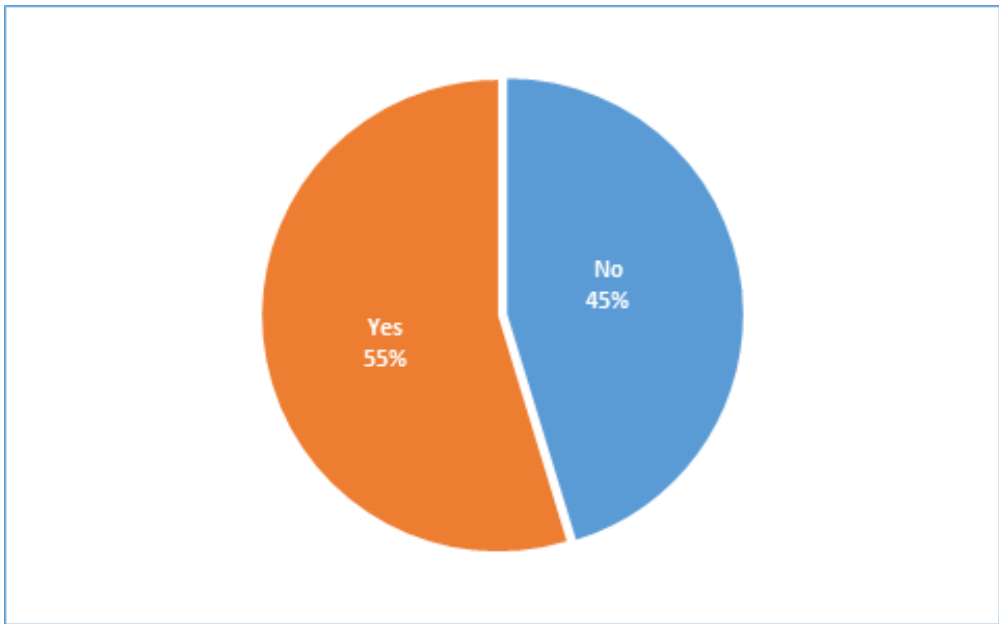
Table 2 – Distribution of companies by size, for each of the six WB

Number of employees	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
1-10	31	10	17	4	7	30	99
11-50	25	11	10	2	18	55	121
51-250	4	38	4		25	38	109
250+	1	14	1	1	20	16	53
Total	**61**	**73**	**32**	**7**	**70**	**139**	**382**

Source: Survey conducted among local companies from WB.

More than half of the surveyed companies export to the EU (55%), with the average share of production or volume of activity exported standing at 28% (Figure 3). However, there are notable differences among the different economies. The majority of firms in Albania, Kosovo, and Montenegro (70-80%) do not export to the EU, while a similar percentage of firms in Bosnia and Herzegovina and North Macedonia do export. In Serbia, the share of exporters matches the overall sample, at 55% (Table 2).

Figure 3 - Share of companies that export to the EU, for the whole sample



Source: Survey conducted among local companies from WB.

Table 3 - Share of companies that export to the EU, for each of the six economies

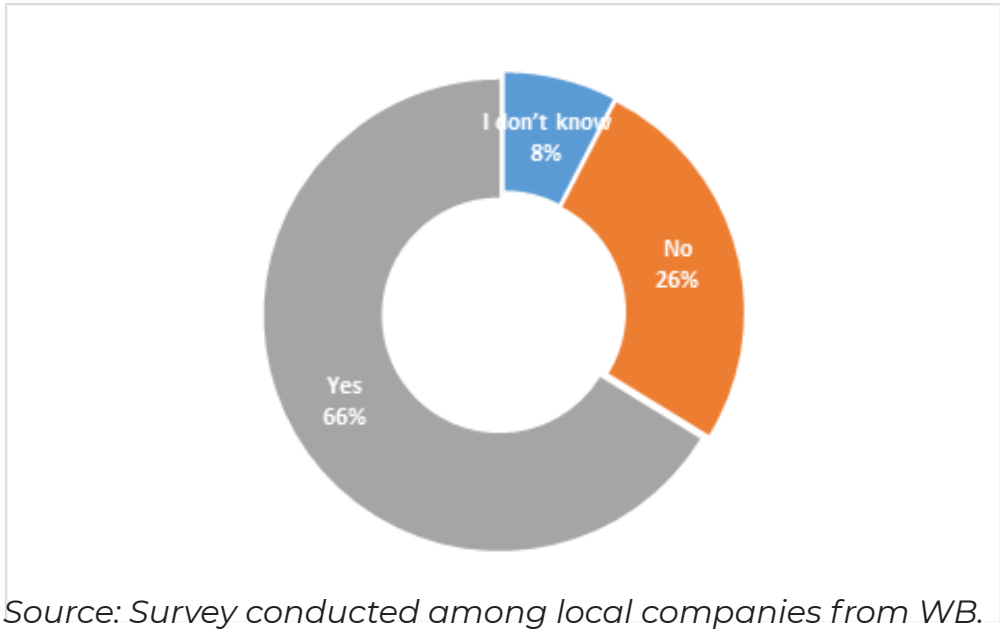
Exporting to EU	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
No	80%	14%	81%	71%	29%	45%	45%
Yes	20%	86%	19%	29%	71%	55%	55%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Attitudes towards decarbonisation

Majority of the companies said that they are familiar with decarbonisation, i.e. with the process of reducing carbon emissions (66%). Around a quarter of the companies said that they are not familiar (26%). The share of companies that are familiar with decarbonisation is fairly high in Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia (between 66% and 84%), but is slightly lower in Albania and Kosovo (41% and 44%, respectively), as can be seen in Table 4. The explanation for the lower share in Albania and Kosovo is the prevalence of smaller firms in the surveys there. As can be seen in Table 5, the bigger the size of the companies, the greater the share of them who are familiar with decarbonisation. In the group of companies with 250+ employees, 89% of the firms are familiar, while in the group of 1-10 employees, the share is just 39%.

Figure 4 - Are you familiar with decarbonisation (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 4 – Share of companies that are familiar with decarbonisation in each of the economies covered

Are you familiar with decarbonisation?	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
I don't know	0%	5%	16%	0%	9%	10%	8%
No	59%	11%	41%	29%	11%	24%	26%
Yes	41%	84%	44%	71%	80%	66%	66%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

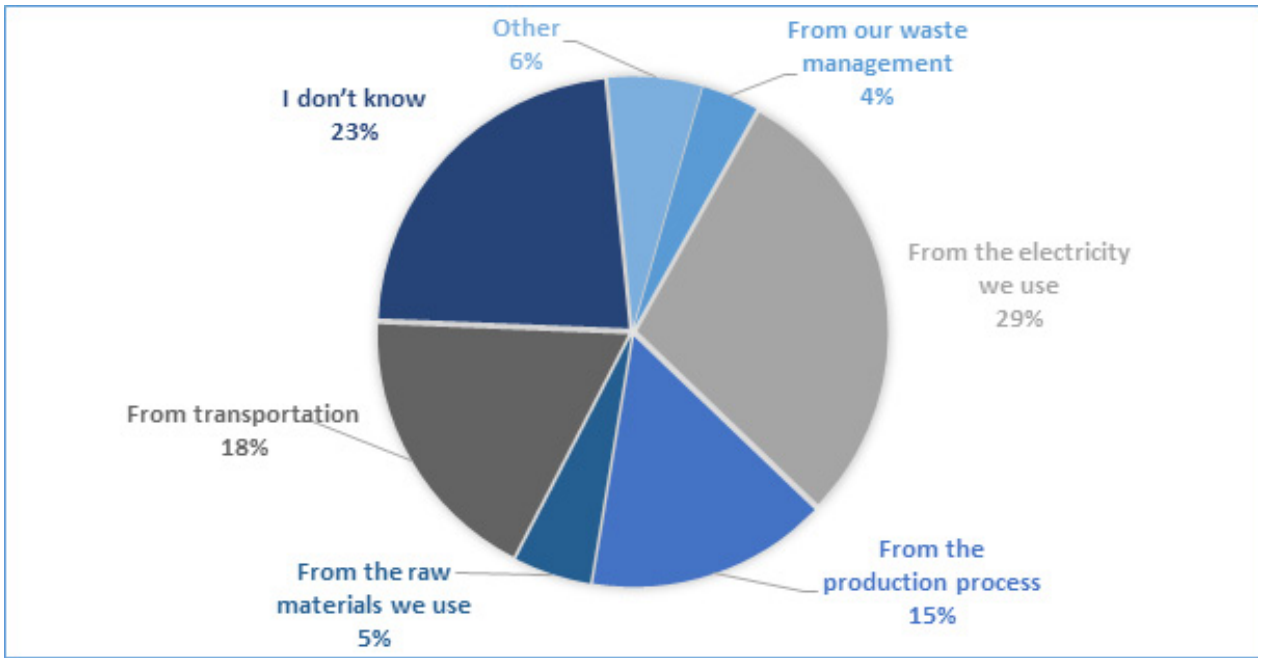
Are you familiar with decarbonisation?	1-10	11-50	51-250	250+	Total
I don't know	7%	6%	11%	6%	8%
No	54%	26%	11%	6%	26%
Yes	39%	68%	78%	89%	66%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Most of the companies said that most of their carbon emissions come from the electricity they use (29%). Transportation is the second biggest source (18%), and the production process being the third (15%). Interestingly, almost a quarter of the companies said they do not know where most of their emissions come from (Figure 5). These shares are fairly consistent across the economies, the only notable differences being that in Albania and Kosovo, the share of companies who do not know where their emissions are coming from is slightly higher (38% and 34% respectively), and in Kosovo, the share of transportation exceeds the share of electricity (Table 6).

Interesting patterns can be noted when one looks at these answers by size of company. Namely, for the micro companies (1-10 employees), most of the CO2 emissions come from transportation, differently from the other groups. The bigger the company gets, the bigger the share of the electricity. Similarly, smaller companies more often do not know where their CO2 emissions come from (Table 7).

Figure 5 - Do you know where most of the carbon emissions of your company are coming from? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 6 – Origins of carbon emissions, by economies

Where are most of your carbon emissions coming from?	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
From our waste management	8%	3%	3%	0%	6%	1%	4%
From the electricity we use	23%	36%	13%	29%	33%	30%	29%
From the production process	13%	33%	13%	14%	19%	6%	15%
From the raw materials we use	5%	5%	6%	0%	6%	4%	5%
From transportation	13%	4%	25%	29%	16%	27%	18%
I don't know	38%	15%	34%	14%	13%	23%	23%
Other	0%	4%	6%	14%	9%	8%	6%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Table 7 – Origins of carbon emissions, by firm size

Where are most of your carbon emissions coming from?	1-10	11-50	51-250	250+	Total
From our waste management	5%	3%	3%	4%	4%
From the electricity we use	19%	31%	29%	43%	29%
From the production process	8%	13%	22%	21%	15%
From the raw materials we use	4%	4%	6%	6%	5%
From transportation	20%	21%	16%	11%	18%
I don't know	37%	21%	19%	8%	23%
Other	6%	7%	5%	8%	6%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

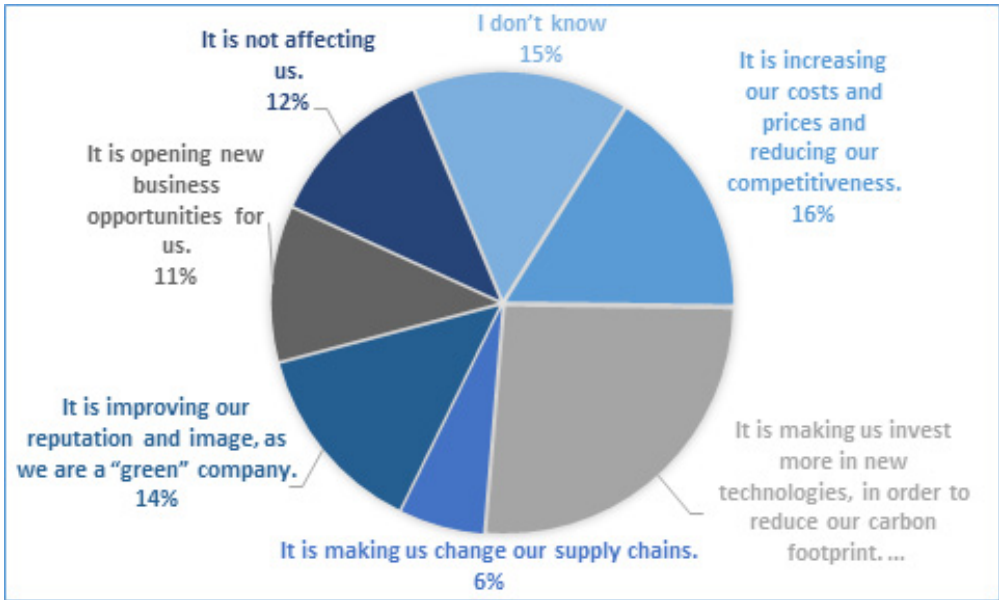
Source: Survey conducted among local companies from WB.

The answers to the question - in which way is decarbonisation affecting your company – reveal very interesting insights. Most of the companies say that decarbonisation is making them invest in new technologies, in order to reduce carbon emissions (26%). Thus, it seems that decarbonisation can indeed serve as a vehicle for technological upgrading in the Western Balkans. The second most common answer is that decarbonisation is increasing costs and prices and reducing competitiveness, but this option is chosen much less often (16%). Very close to it in terms of prevalence is the answer that decarbonisation is improving the reputation and image of the companies (14%), while 11% of the answers are that it is opening new business opportunities (Figure 6). Thus, one could say that Western Balkan companies clearly tend to have a rather positive view of decarbonisation much more often than a negative one.

These patterns are rather consistent among the six economies, with only Montenegro being a small exception, as most of the answers there (50%) are that decarbonisation is increasing costs and prices and reducing competitiveness (Table 8). This is explained by the smaller number of companies that have answered the survey there (just 7).

When observed by different sizes of companies, the patterns are again fairly stable, with a notable difference among micro companies (1-10 employees). Most of them said that they are not affected by decarbonisation (18%), and of those that are affected, decarbonisation is more cost increaser than a technology catalyser (14% vs 12%). The bigger the company gets, the more likely it is to say that decarbonization is making them invest in new technologies (Table 9).

Figure 6 - In which ways is decarbonisation affecting your company? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 8 – In which ways is decarbonisation affecting your company? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
It is increasing our costs and prices and reducing our competitiveness.	21%	23%	6%	50%	10%	15%	16%
It is making us invest more in new technologies, in order to reduce our carbon footprint.	27%	28%	29%	0%	29%	23%	26%
It is making us change our supply chains.	4%	7%	6%	0%	7%	6%	6%
It is improving our reputation and image, as we are a "green" company.	7%	12%	6%	13%	26%	10%	14%
It is opening new business opportunities for us.	3%	13%	0%	13%	16%	11%	11%
It is not affecting us.	20%	5%	23%	0%	5%	16%	12%
I don't know	17%	11%	31%	25%	8%	19%	15%

Source: Survey conducted among local companies from WB.

Table 9 – In which ways is decarbonisation affecting your company? (answers for companies with different sizes)

Values	1-10	11-50	51-250	250+	Total
It is increasing our costs and prices and reducing our competitiveness.	14%	18%	17%	15%	16%
It is making us invest more in new technologies, in order to reduce our carbon footprint.	12%	25%	31%	35%	26%
It is making us change our supply chains.	5%	5%	6%	8%	6%
It is improving our reputation and image, as we are a "green" company.	10%	11%	16%	20%	14%
It is opening new business opportunities for us.	10%	10%	10%	15%	11%
It is not affecting us.	18%	16%	7%	6%	12%
I don't know	31%	15%	13%	1%	15%

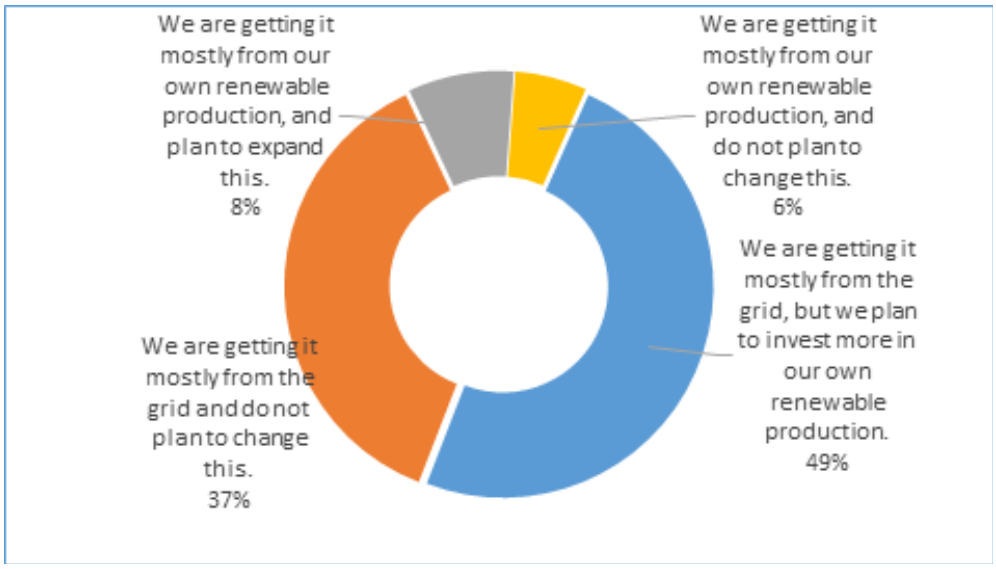
Source: Survey conducted among local companies from WB.

Looking at how companies are getting the electricity they use, big majority of them are getting it mostly from the grid (86%), while only 14% are getting it mostly from their own renewable sources. However, it is interesting to observe that of those companies who are getting their electricity from the grid, more than half are planning to invest more in their own renewable production (Figure 7). Thus, there seems to be a clear interest among companies in the Western Balkans to invest in their own renewable energy generation.

These patterns are fairly stable across the six Western Balkan economies, with some differences in Kosovo and Serbia. There, most of the companies said that even though they get most of their energy from the grid, they do not plan to change this. In Kosovo, this share is 72% of all the responses, while in Serbia, it is 48% (Table 10).

Observed by companies of different sizes, bigger companies plan more often to invest in their own renewable production. 66% of the companies with more than 250 employees said they are getting most of their electricity from the grid, but plan to invest more in their own renewable production. This share was 36% among for the companies with 1-10 employees (Table 11).

Figure 7 - How do you get your electricity and do you plan to change it in near future? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 10 – How do you get your electricity and do you plan to change it in near future? (answers for each of the economies)

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
We are getting it mostly from our own renewable production, and do not plan to change this.	15%	3%	0%	14%	10%	1%	5%
We are getting it mostly from our own renewable production, and plan to expand this.	10%	10%	0%	0%	14%	6%	8%
We are getting it mostly from the grid and do not plan to change this.	23%	26%	72%	43%	23%	48%	37%
We are getting it mostly from the grid, but we plan to invest more in our own renewable production.	52%	62%	28%	43%	53%	45%	49%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Table 11 – How do you get your electricity and do you plan to change it in near future (answers for companies with different sizes)

	1-10	11-50	51-250	250+	Total
We are getting it mostly from our own renewable production, and do not plan to change this.	8%	2%	6%	8%	5%
We are getting it mostly from our own renewable production, and plan to expand this.	2%	8%	11%	13%	8%
We are getting it mostly from the grid and do not plan to change this.	54%	42%	28%	13%	37%
We are getting it mostly from the grid, but we plan to invest more in our own renewable production.	36%	48%	54%	66%	49%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

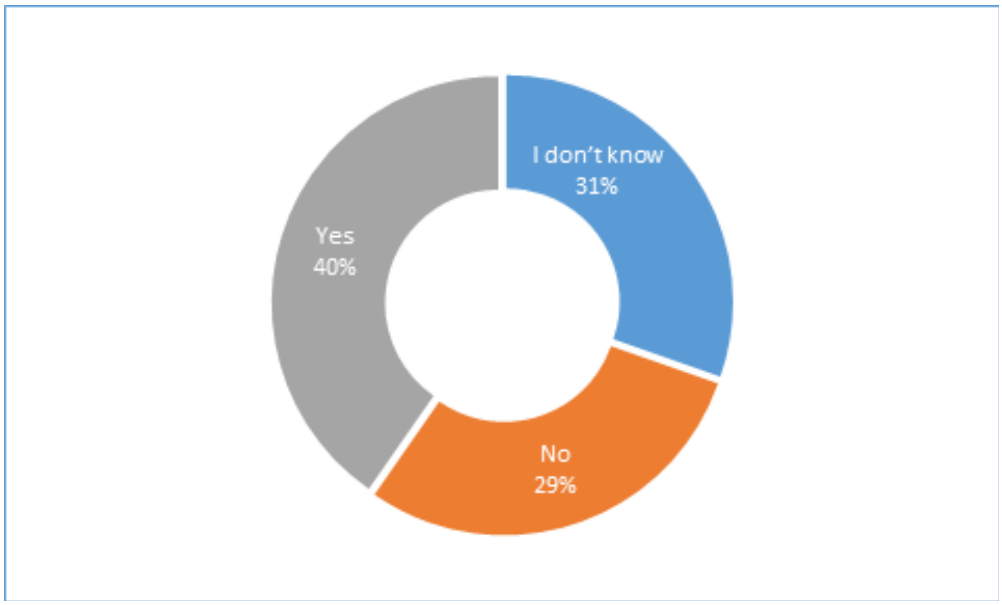
Source: Survey conducted among local companies from WB.

Most of the companies think that if they reduce their carbon emissions, they might have greater chances to export to the EU market – 40%. Still, the share of those who give a negative answer to this question, or who say that they don't know, is also high, both around 30% (Figure 8).

There are interesting patterns by different economies here. In Bosnia and Herzegovina, Montenegro and North Macedonia, more than half of the companies gave a positive answer to this question. In Albania, by contrast, more than half of the companies had a negative answer here. In Kosovo and Serbia, most of the companies said that they don't know, while the share of those who said that reducing carbon emissions will improve their chances to export to the EU market was the lowest of the three options (Table 12).

Perhaps unsurprisingly, smaller companies tend to have a more negative view on this question. Among the micro (1-10 employees) and small (11-50) enterprises, most of the respondents say that reducing carbon emissions will not improve their chances to export to the EU market, or that they don't know. Among the medium (51-250) and big (250+) companies, one half or more of the answers are that reducing carbon emissions will improve their chances to export to the EU market (Table 12).

Figure 8 - Do you think that if you reduce your carbon emissions, you might have greater chances to export to the EU market? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 12 – Do you think that if you reduce your carbon emissions, you might have greater chances to export to the EU market? (answers for each of the economies)

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
I don't know	16%	25%	63%	14%	19%	39%	30%
No	54%	12%	28%	14%	24%	31%	29%
Yes	30%	63%	9%	71%	57%	30%	40%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Table 13 – Do you think that if you reduce your carbon emissions, you might have greater chances to export to the EU market? (answers for companies with different sizes)

	1-10	11-50	51-250	250+	Total
I don't know	36%	35%	24%	23%	30%
No	39%	29%	27%	17%	29%
Yes	24%	36%	50%	60%	40%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Most of the companies say that they have concrete plans for reducing their carbon emissions in the next 5 years - 47%, with the share of those who say no being 30% (Figure 9). Again, there are notable differences across the six economies, with firms in Bosnia and Herzegovina, North Macedonia and Serbia, saying more often that they do have concrete plans for reducing carbon emissions. In Albania, the most common answer is that they don't have concrete plans for reducing carbon emissions, while in Kosovo and Montenegro, most of the companies say that they don't know (Table 14).

Bigger companies more often have concrete plans for decarbonisation - among the large companies (250+ employees), three-quarters of the respondents gave this answer. This answer was the most common also for medium (51-250 employees) and small companies (11-50 employees). Micro companies (1-10 employees), by contrast, most of the time said that they don't have concrete plans for reducing carbon emissions in the next 5 years (Table 15).

Figure 9 - In the next five years, do you have some concrete plans to reduce your carbon emissions? (answers for the whole sample)

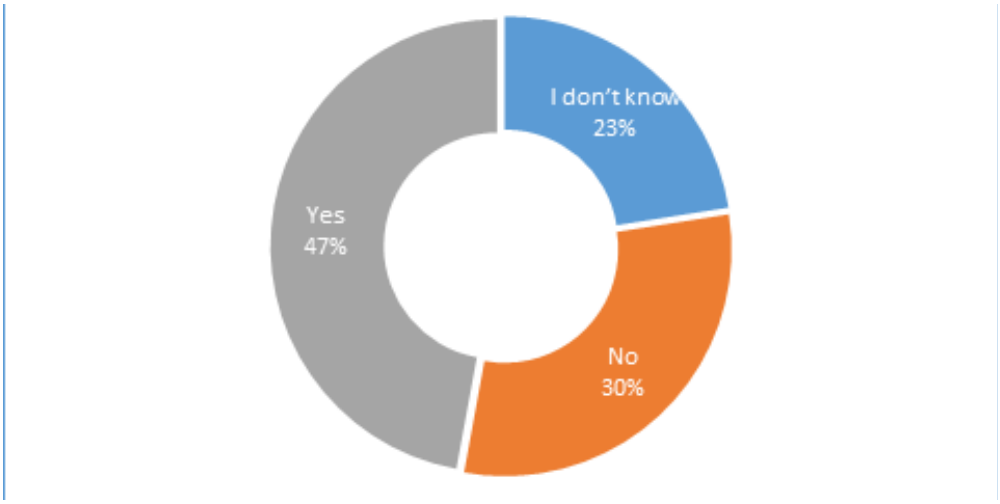


Table 14 – In the next five years, do you have some concrete plans to reduce your carbon emissions? (answers for each of the economies)

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
I don't know	11%	14%	44%	57%	26%	24%	23%
No	49%	32%	25%	14%	14%	32%	30%
Yes	39%	55%	31%	29%	60%	45%	47%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Table 15 – In the next five years, do you have some concrete plans to reduce your carbon emissions? (answers for companies with different sizes)

	1-10	11-50	51-250	250+	Total
I don't know	24%	28%	21%	9%	23%
No	48%	26%	25%	17%	30%
Yes	27%	45%	54%	74%	47%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

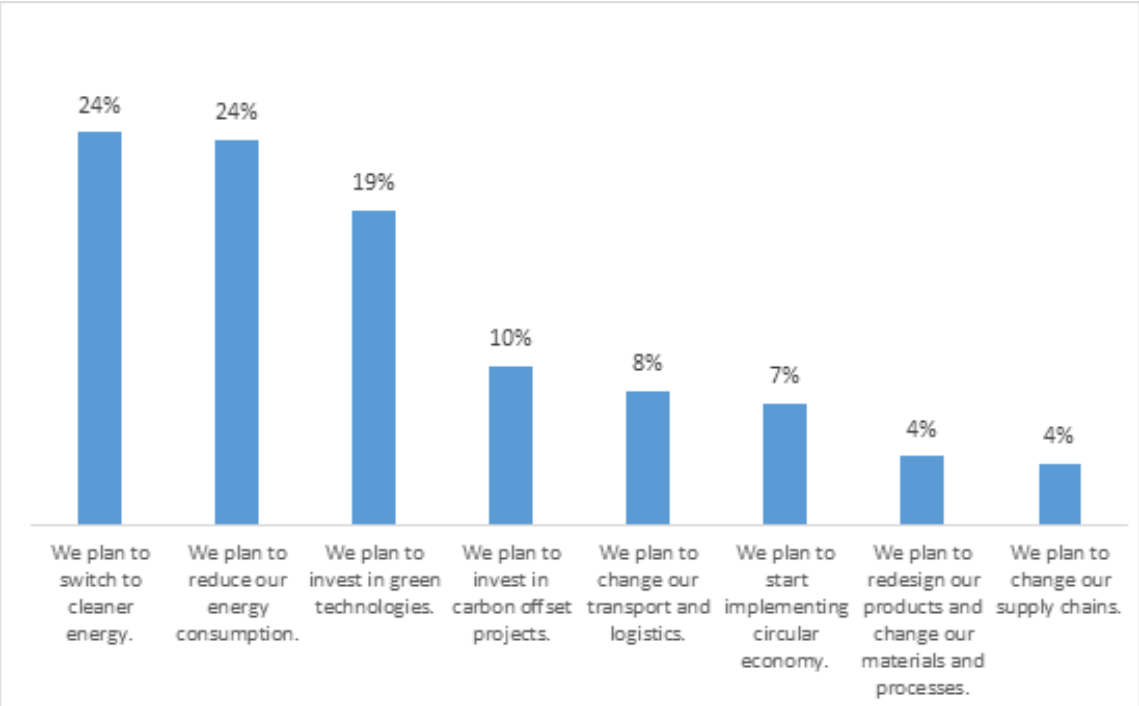
Source: Survey conducted among local companies from WB.

When asked what they plan to do to reduce their carbon emissions, most of the time the companies say they plan to switch to cleaner energy (24% of the responses), to reduce energy consumption (24%), and to invest in green technologies (19%). Fewer answers refer to investing in caron offset projects (10%), changing transport and logistics (8%) and implementing circular economy models (7%). The least common answers are redesigning products (4%) and changing supply chains (4%), Figure 10.

These three intentions dominate in all the six economies, with minor differences. In Albania, changing transport and logistics is among the top three options (20% of responses), slightly more common than investing in green technologies (16%). In Montenegro, the number one answer is investing in green technologies, with 33% of the answers (Table 16).

Perhaps surprisingly, the answer to this question is fairly consistent across companies of different sizes. For all size groups, the three most common replies are switching to cleaner energy, reducing energy consumption, and investing in green technologies (Table 17).

Figure 10 - What do you plan to do to reduce your carbon emissions? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 16 – What do you plan to do to reduce your carbon emissions? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
We plan to switch to cleaner energy.	25%	23%	28%	17%	25%	23%	24%
We plan to reduce our energy consumption.	22%	24%	28%	17%	18%	27%	24%
We plan to change our transport and logistics.	20%	1%	13%	8%	6%	9%	8%
We plan to invest in green technologies.	16%	19%	18%	33%	24%	17%	19%
We plan to redesign our products and change our materials and processes.	5%	4%	3%	8%	7%	2%	4%
We plan to change our supply chains.	4%	5%	3%	0%	3%	3%	4%
We plan to start implementing circular economy.	4%	9%	5%	8%	11%	5%	7%
We plan to invest in carbon offset projects.	5%	15%	3%	8%	6%	12%	10%

Source: Survey conducted among local companies from WB.

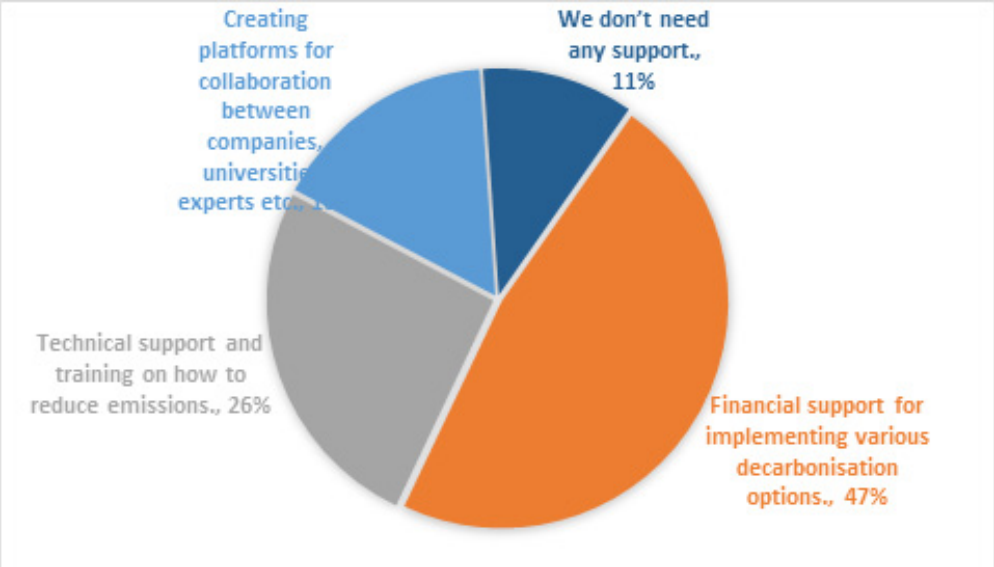
Table 17 – What do you plan to do to reduce your carbon emissions? (answers for companies with different sizes)

Values	1-10	11-50	51-250	250+	Total
We plan to switch to cleaner energy.	24%	27%	24%	21%	24%
We plan to reduce our energy consumption.	25%	25%	23%	21%	24%
We plan to change our transport and logistics.	15%	12%	4%	4%	8%
We plan to invest in green technologies.	18%	18%	20%	20%	19%
We plan to redesign our products and change our materials and processes.	2%	4%	4%	5%	4%
We plan to change our supply chains.	1%	2%	4%	8%	4%
We plan to start implementing circular economy.	7%	5%	8%	10%	7%
We plan to invest in carbon offset projects.	7%	6%	13%	12%	10%

Source: Survey conducted among local companies from WB.

When asked what kind of support they need in order to reduce their carbon footprint, the companies are unequivocal that they need first and foremost a financial support. Almost half of the companies gave this answer (47%), with the second most common answer – for technical support – receiving almost half of that (26%), Figure 11. This was remarkably stable across the six economies (Table 16) and across companies of different sizes (Table 17). The only notable difference here is that smaller companies more often tend to say that they do not need any help.

Figure 11 - What kind of support do you need to reduce your carbon footprint? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 18 – What kind of support do you need to reduce your carbon footprint? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
Technical support and training on how to reduce emissions.	27%	30%	19%	20%	26%	23%	26%
Financial support for implementing various decarbonisation options.	42%	46%	57%	50%	49%	47%	47%
Creating platforms for collaboration between companies, universities, experts etc.	21%	19%	3%	20%	19%	13%	16%
We don't need any support.	10%	5%	22%	10%	5%	17%	11%

Source: Survey conducted among local companies from WB.

Table 19 – What kind of support do you need to reduce your carbon footprint? (answers for companies with different sizes)

Values	1-10	11-50	51-250	250+	Total
Technical support and training on how to reduce emissions.	26%	23%	28%	26%	26%
Financial support for implementing various decarbonisation options.	39%	57%	45%	45%	47%
Creating platforms for collaboration between companies, universities, experts etc.	21%	8%	17%	21%	16%
We don't need any support.	14%	12%	9%	8%	11%

Source: Survey conducted among local companies from WB.

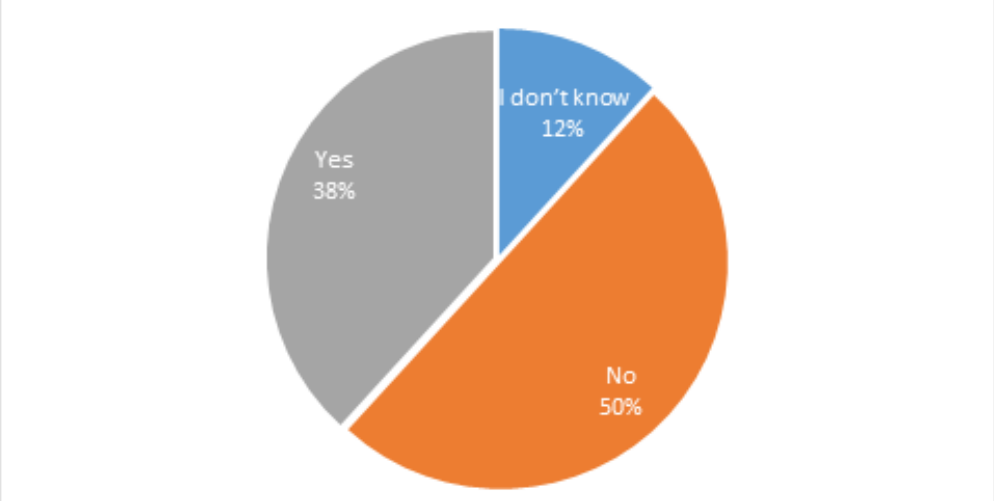
Attitudes towards the Carbon Border Adjustment Mechanism

Regarding the questions on the EU's Carbon Border Adjustment Mechanism (CBAM), notable differences emerge compared to the general questions on decarbonisation. The first interesting finding is that most companies surveyed are not familiar with the CBAM, i.e. the proposal to impose a carbon tax on imports to the EU from countries with less stringent climate policies. Half of the companies gave this response, while 38% said they are familiar with it. Additionally, 12% were unsure whether they are familiar with the proposal or not (Figure 12).

There are significant differences among the six economies surveyed. In Bosnia and Herzegovina, Montenegro, and North Macedonia, most companies reported being familiar with the CBAM, whereas in the other three economies, most companies reported not being familiar. In Albania and Serbia, over 60% of companies stated they are not familiar with the CBAM (Table 20).

There are also clear size-related patterns here, with smaller companies more frequently indicating unfamiliarity with the CBAM. Still, even among large companies (250+ employees), almost a third of respondents reported not being familiar with it (Table 21).

Figure 12 - Are you familiar with the Carbon Border Adjustment Mechanism? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 20 – Are you familiar with the Carbon Border Adjustment Mechanism? (answers for each of the economies)

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
I don't know	10%	12%	22%	14%	10%	11%	12%
No	64%	29%	47%	29%	41%	61%	50%
Yes	26%	59%	31%	57%	49%	28%	38%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

Table 21 – Are you familiar with the Carbon Border Adjustment Mechanism? (answers for companies of different sizes)

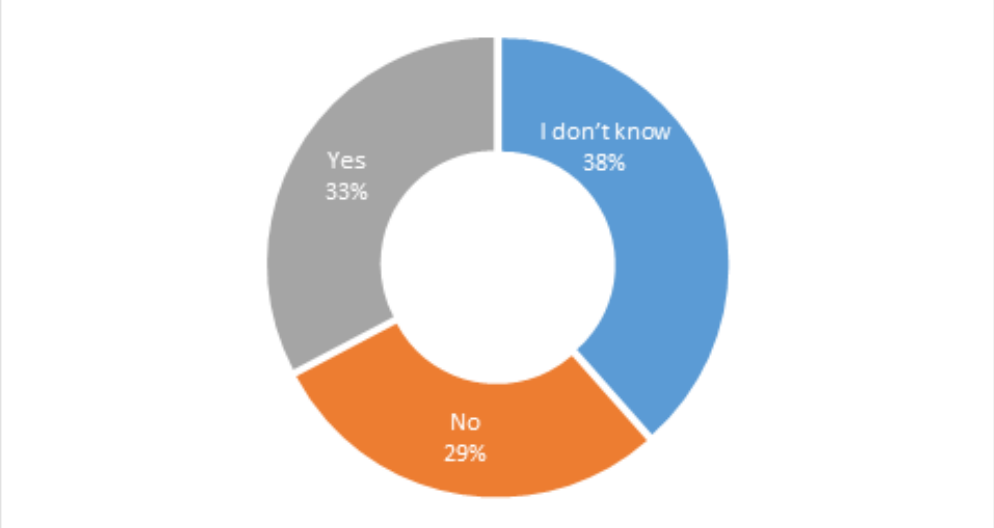
Row Labels	1-10	11-50	51-250	250+	Total
I don't know	9%	12%	17%	6%	12%
No	70%	55%	37%	30%	50%
Yes	21%	34%	46%	64%	38%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Survey conducted among local companies from WB.

The lack of knowledge about the CBAM is evident in the responses to the question whether companies will be affected by it. A majority of 38% said they don't know if they will be affected, 33% said they will be affected, and 29% said they won't be affected (Figure 13). Distinctive patterns emerge among the different economies: most firms in Serbia, Montenegro, and Kosovo reported that they don't know whether they will be affected, while in Bosnia and Herzegovina and North Macedonia, the most common response was that companies will be affected. In Albania, 59% of companies said they won't be affected (Table 22).

When looking at company sizes, smaller companies more often reported that they won't be affected by the CBAM, whereas larger companies more frequently said they will be affected. The proportion of companies unsure whether they will be affected appears to be fairly consistent across different company sizes (Table 23).

Figure 13 - Will the Carbon Border Adjustment Mechanism affect your company? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 22 – Will the Carbon Border Adjustment Mechanism affect your company? (answers for each of the economies)

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
I don't know	15%	37%	47%	71%	39%	46%	38%
No	59%	11%	34%	14%	20%	29%	29%
Yes	26%	52%	19%	14%	41%	25%	33%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100 %**

Source: Survey conducted among local companies from WB.

Table 22 – Will the Carbon Border Adjustment Mechanism affect your company? (answers for each of the economies)

Labels	1-10	11-50	51-250	250+	Total
I don't know	37%	40%	43%	26%	38%
No	46%	26%	17%	26%	29%
Yes	16%	34%	39%	47%	33%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

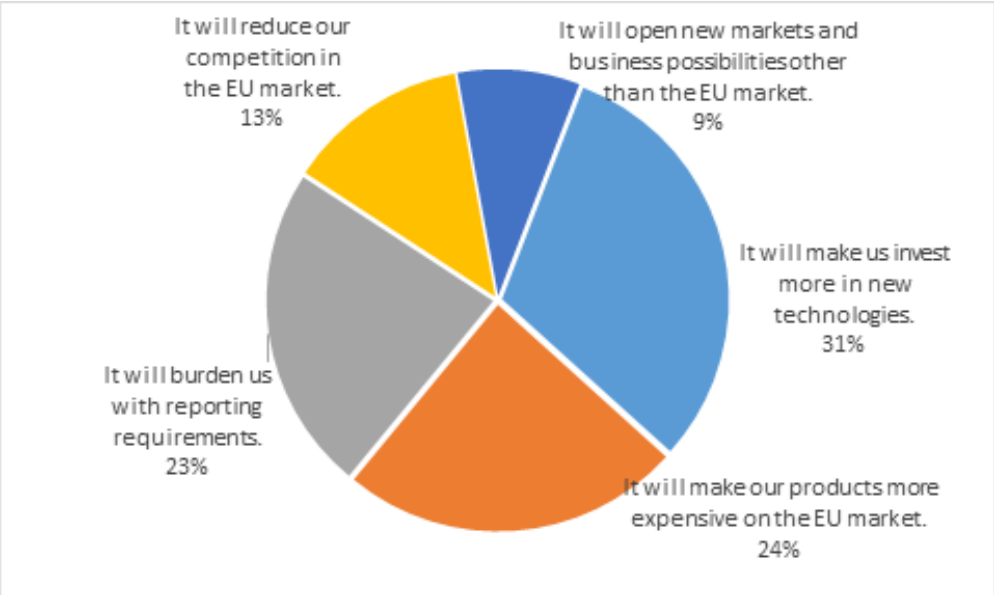
Source: Survey conducted among local companies from WB.

Overall, companies from the Western Balkans generally have a more negative than positive view of the CBAM's effects. When asked how the CBAM will affect them, the most common response is that it will prompt companies to invest more in new technologies (31%). However, the next three most common responses are negative: it will increase prices (24%), it will burden companies with reporting requirements (23%), and it will reduce competition in the EU market (13%). About 9% of companies stated that the CBAM will open new opportunities for them.

Companies in Albania and Kosovo seem to have a more positive perspective, with a significantly higher share of responses indicating that the CBAM will lead to investment in new technologies (56% and 41%, respectively).

Interestingly, there do not appear to be significant differences between firms of different sizes in terms of their views on the CBAM's impact. The only notable difference is that smaller firms more often say they don't know, while larger companies choose this option less frequently.

Figure 14 - In which ways will the CBAM affect your company? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 24 – In which ways will the CBAM affect your company? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
It will make our products more expensive on the EU market.	15%	21%	9%	11%	25%	19%	20%
It will burden us with reporting requirements.	4%	29%	9%	0%	15%	18%	19%
It will make us invest more in new technologies.	56%	23%	41%	22%	24%	20%	25%
It will reduce our competition in the EU market.	4%	11%	13%	11%	12%	10%	11%
It will open new markets and business possibilities other than the EU market.	4%	6%	6%	11%	6%	9%	7%
I don't know	19%	9%	22%	44%	19%	24%	18%

Source: Survey conducted among local companies from WB.

Table 25 – In which ways will the CBAM affect your company? (answers for companies of different sizes)

Values	1-10	11-50	51-250	250+	Total
It will make our products more expensive on the EU market.	13%	18%	22%	24%	20%
It will burden us with reporting requirements.	11%	14%	23%	25%	19%
It will make us invest more in new technologies.	19%	31%	24%	25%	25%
It will reduce our competition in the EU market.	10%	8%	12%	13%	11%
It will open new markets and business possibilities other than the EU market.	13%	6%	6%	6%	7%
I don't know	35%	23%	13%	8%	18%

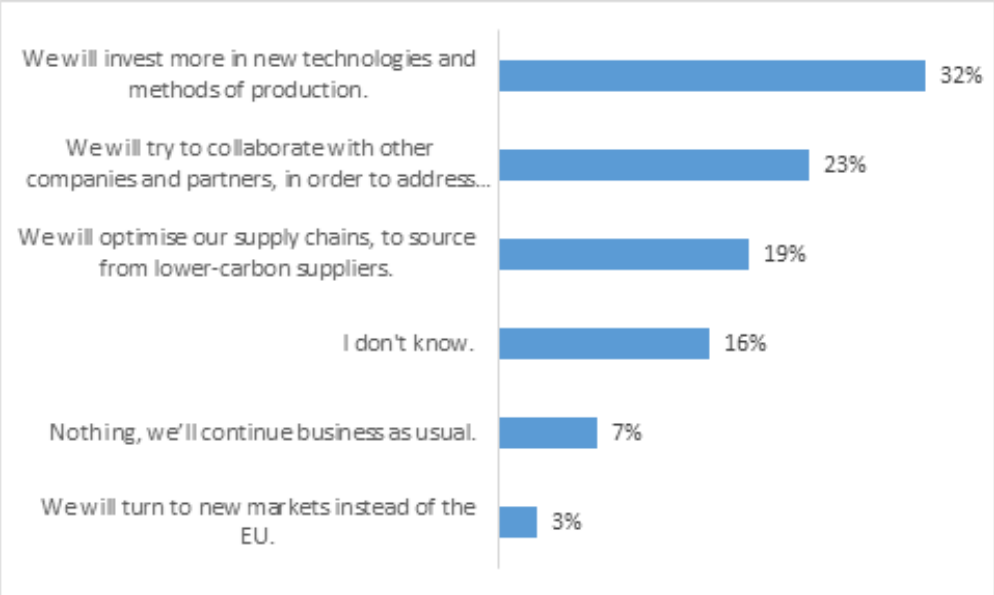
Source: Survey conducted among local companies from WB.

A more positive perspective emerges when companies are asked what actions they intend to take because of the CBAM. Most (32%) say they plan to invest in new technologies, with the second most common response being cooperation with other companies to overcome challenges together (23%). Additionally, 19% of companies intend to optimize supply chains to source from lower-carbon suppliers. Only 7% of companies say they won't do anything, and just 3% say they will turn to new markets.

There are no significant differences across the six economies, as these three responses are the most common everywhere. However, in Montenegro and Serbia, a notably higher percentage of companies say they don't know what they will do (38% and 24%, respectively). In the other four economies, this share is 16% or below.

When looking at companies of different sizes, the most common responses remain consistent. Interestingly, the share of companies investing in new technologies and optimizing supply chains increases with company size, while the share of those saying they won't do anything or don't know decreases.

Figure 15 - What does your company intend to do because of the CBAM? (answers for the whole sample)



Source: Survey conducted among local companies from WB.

Table 26 – What does your company intend to do because of the CBAM? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
Nothing, we'll continue business as usual.	4%	4%	15%	0%	5%	13%	7%
We will invest more in new technologies and methods of production.	59%	30%	31%	38%	34%	26%	32%
We will optimise our supply chains, to source from lower-carbon suppliers.	7%	28%	15%	13%	23%	10%	19%
We will try to collaborate with other companies and partners, in order to address challenges together.	11%	32%	15%	13%	17%	24%	23%
We will turn to new markets instead of the EU.	4%	0%	8%	0%	5%	3%	3%
I don't know	15%	6%	15%	38%	16%	24%	16%

Source: Survey conducted among local companies from WB.

Table 27 – What does your company intend to do because of the CBAM? (answers for companies of different sizes)

Values	1-10	11-50	51-250	250+	Total
Nothing, we'll continue business as usual.	16%	12%	3%	2%	7%
We will invest more in new technologies and methods of production.	22%	35%	31%	40%	32%
We will optimise our supply chains, to source from lower-carbon suppliers.	13%	13%	23%	25%	19%
We will try to collaborate with other companies and partners, in order to address challenges together.	22%	22%	26%	20%	23%
We will turn to new markets instead of the EU.	3%	2%	3%	3%	3%
I don't know	25%	17%	13%	10%	16%

Source: Survey conducted among local companies from WB.

Finally, regarding the support companies need to better cope with the challenges and opportunities of the CBAM, there are notable differences compared to the respective question on decarbonisation. The most common response is that companies need more information on what the CBAM means for them (20%). The two other options related to technical support—for reducing carbon footprints and for carbon accounting and reporting—received 16% and 15% of the votes, respectively, meaning that responses focused on knowledge and technical support make up more than half of the answers. Financial support options—for investing in new technologies and for compensating higher export costs due to the CBAM—account for 20% and 17% of the responses, respectively. This shows that while companies still need financial support to cope with the CBAM, the issues related to it are not solely about finances.

The answers are fairly consistent across different economies, with a noticeable difference in Albania, where financial support options dominate (48% in total). In Montenegro, a significant number of companies indicated a need for platforms to facilitate collaboration between universities, companies, experts, and others (18%). Looking at company size, there is very little variation in the answers to this question.

Figure 16 - What kind of support do you need to cope better with the challenges and opportunities arising from the CBAM? (answers for the whole sample)

Source: Survey conducted among local companies from WB.

Table 28 – What kind of support do you need to cope better with the challenges and opportunities arising from the CBAM? (answers for each of the economies)

Values	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia	Total
More information on what it means for my company and how will it affect us.	17%	16%	33%	18%	20%	21%	20%
Technical support and training on how to reduce our carbon footprint.	17%	17%	15%	9%	18%	14%	16%
Technical support and training on carbon accounting and reporting.	11%	21%	8%	18%	14%	13%	15%
Financial support to make up the higher export costs because of the CBAM.	26%	18%	15%	9%	16%	17%	17%
Financial support for investing into new technologies.	22%	20%	15%	18%	18%	21%	20%
Creating platforms for collaboration between companies, universities, experts etc., on how to adapt to CBAM.	2%	6%	8%	18%	12%	8%	8%
We don't need any support.	4%	1%	8%	9%	2%	6%	3%

Source: Survey conducted among local companies from WB.

Table 29 – What kind of support do you need to cope better with the challenges and opportunities arising from the CBAM? (answers for companies of different sizes)

Values	1-10	11-50	250+	51-250	Total
More information on what it means for my company and how will it affect us.	22%	20%	19%	19%	20%
Technical support and training on how to reduce our carbon footprint.	16%	15%	19%	16%	16%
Technical support and training on carbon accounting and reporting.	14%	13%	19%	17%	15%
Financial support to make up the higher export costs because of the CBAM.	16%	19%	14%	19%	17%
Financial support for investing into new technologies.	17%	22%	19%	19%	20%
Creating platforms for collaboration between companies, universities, experts etc., on how to adapt to CBAM.	7%	8%	11%	8%	8%
We don't need any support.	7%	4%	0%	3%	3%

Source: Survey conducted among local companies from WB.

Cooperation with foreign companies present in the Western Balkans

Turning to the questions on cooperation with foreign companies present in the Western Balkans, about half of the local companies surveyed said they are cooperating (49%). This is slightly lower than in the 2021 survey, where 55% of respondents reported cooperation (Jovanovic et al., 2021). Interestingly, in Albania and Kosovo, around three-quarters of the local companies said they are not cooperating with foreign companies, while in Montenegro, North Macedonia, and Serbia, the share of those that do cooperate is much higher, around 60%. This trend partly reflects the greater presence of smaller firms in the surveys conducted in Albania and Kosovo, as smaller firms tend to cooperate less with foreign companies. Only 37% of micro firms (1-10 employees) reported cooperation, whereas among large companies (250+ employees), this share is 60%.

APENDIX II

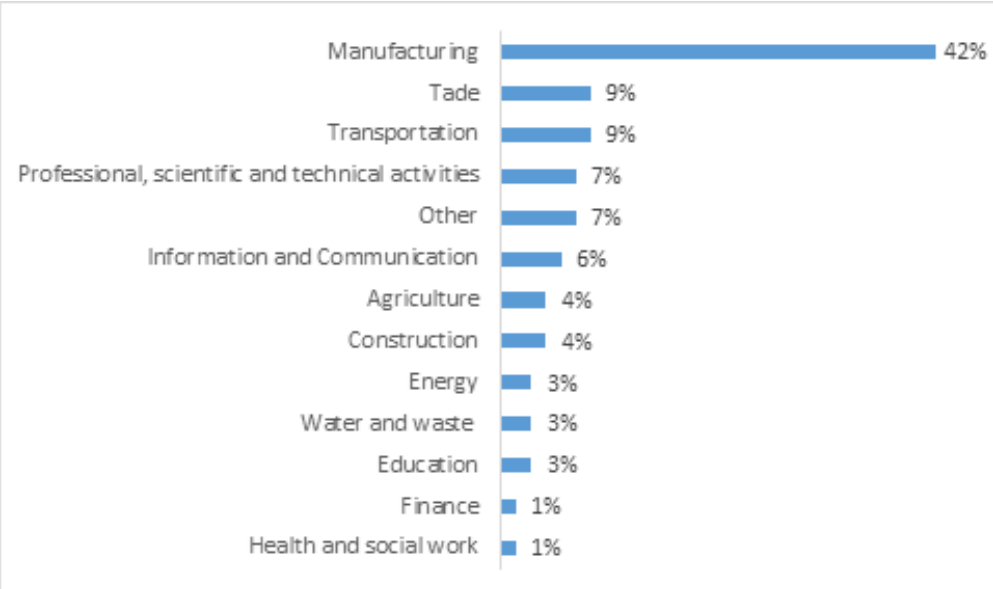
Survey regarding decarbonization and CBAM among FDIs

To analyse perceptions, attitudes, and views of foreign companies operating in the Western Balkans, on investing and working in the region, cooperation with local companies, nearshoring, decarbonisation and the CBAM, a survey was conducted in May-June 2024 by the Serbian-German Chamber of Commerce (AHK Serbia), covering Serbia and Montenegro, the Delegation of German Industry and Commerce in North Macedonia (AHK North Macedonia) covering North Macedonia, Albania and Kosovo and the Delegation of German Industry and Commerce in Bosnia and Herzegovina.

The survey was based on a questionnaire designed specifically for this project, consisting of 22 questions organized into several groups: general information about the company, investing in the Western Balkans, cooperation with local companies, nearshoring, decarbonisation and CBAM. The exact questions are presented in Appendix 1. Below, we briefly present the main findings.

A total of 65 companies responded to the survey. The majority of these companies are from the manufacturing sector (42%), followed by the trade and transportation sectors, each representing 9% Figure 1).

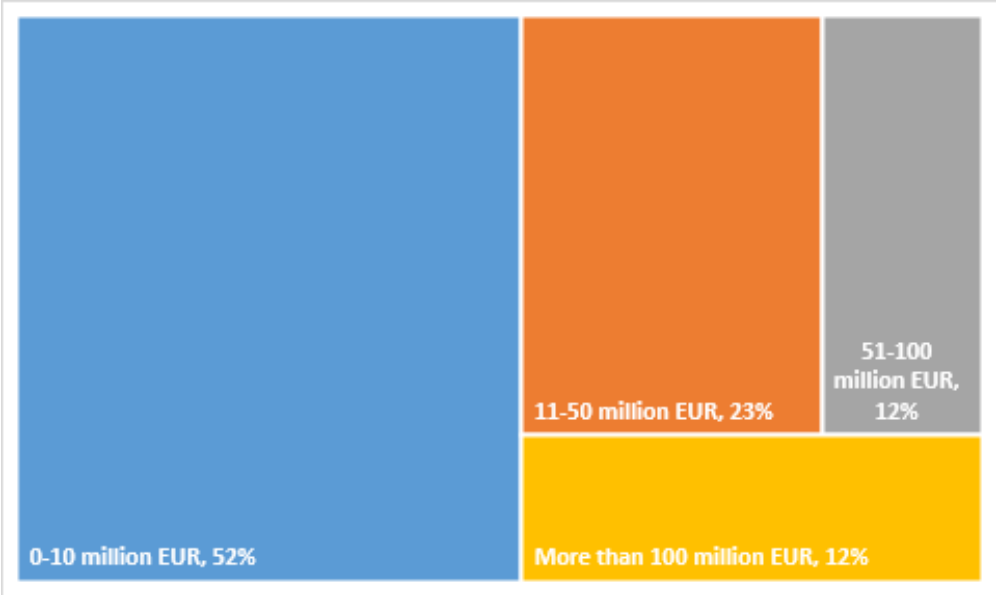
Figure 1 – Distribution of companies by sector of activity



Source: Survey conducted among German companies operating in the Western Balkans.

Most of the companies that answered the survey had investments in the region below 10 million EUR (52%). 23% of the companies had investments between 11-50 million EUR, while 12% had investments between 51-100 million EUR and above 100 million EUR (Figure 2).

Figure 2 – Distribution of companies by size of investment in the Western Balkans



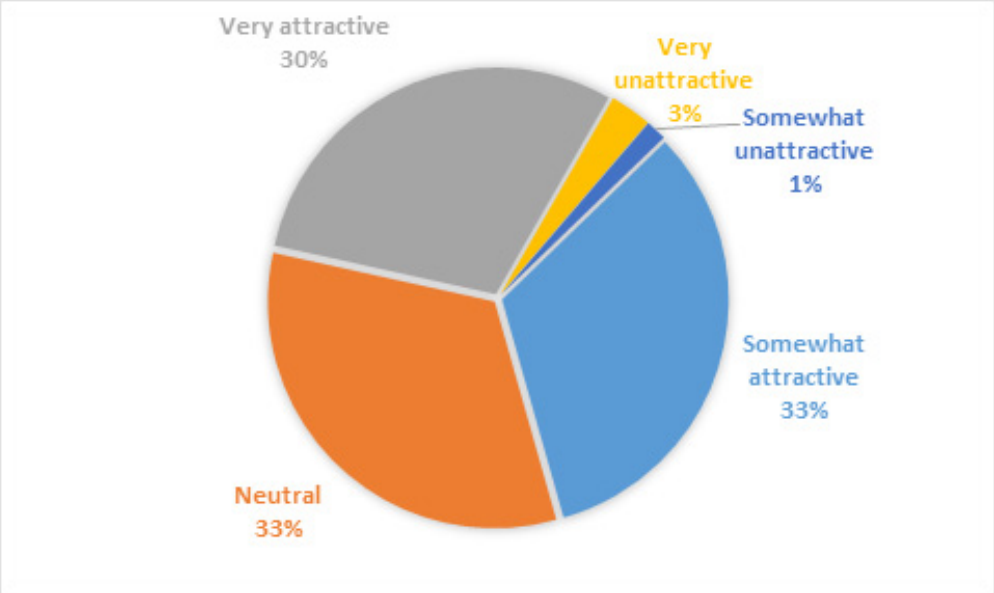
Source: Survey conducted among German companies operating in the Western Balkans.

Decarbonisation and CBAM

Foreign companies operating in the Western Balkans see the region as an attractive destination for green investment. Two-thirds of them indicated that the region is either very attractive or somewhat attractive. Another third had a neutral view, while only 4% found the region to be unattractive (Figure 13). This suggests that the region has the potential to benefit from the ongoing decarbonisation trend, as it possesses features that make it appealing for green investments.

Figure 13 - How do you perceive the Western Balkans region in terms of its attractiveness for green investments?

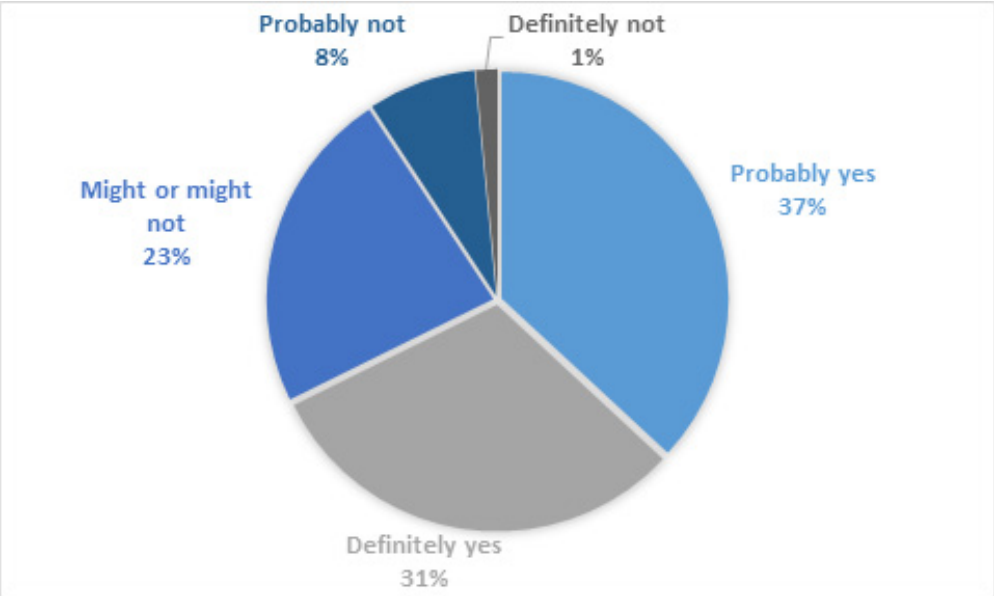
Figure 13 - How do you perceive the Western Balkans region in terms of its attractiveness for green investments?



Source: Survey conducted among German companies operating in the Western Balkans.

When asked whether significant improvements in decarbonization would make them more inclined to invest in the region, two-thirds of the companies responded that they would either probably or definitely invest more. About a quarter of the companies were indifferent, while only 9% said that they probably or definitely wouldn't invest more (Figure 14). This suggests that decarbonization in the Western Balkans is not just a means for achieving environmental and ecological goals, but can be also a vehicle for economic development, as it can attract higher foreign investment in the region.

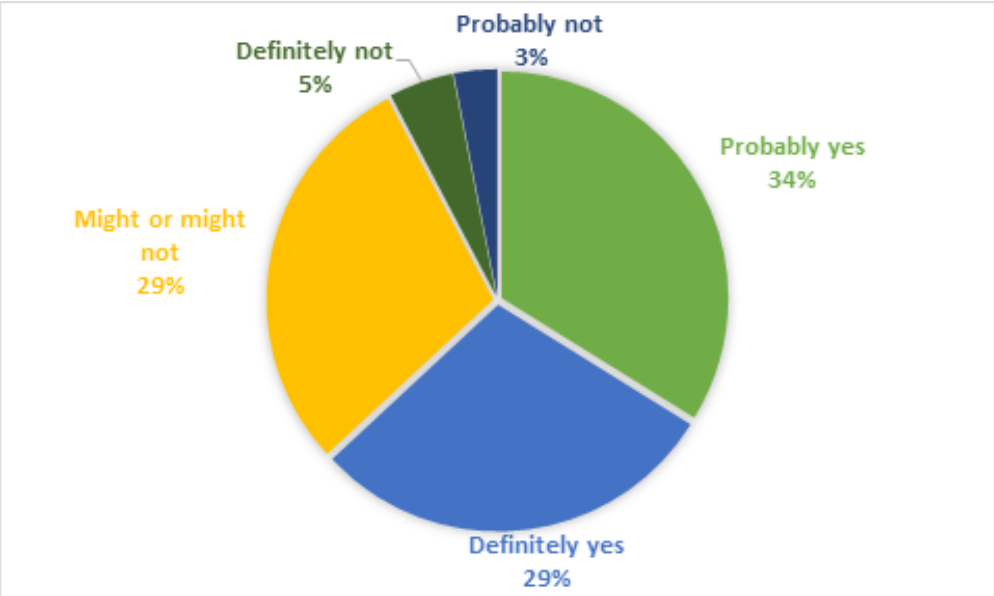
Figure 14 - If the Western Balkans region were to make significant improvements in decarbonisation, would your company be more inclined to increase its investments there?



Source: Survey conducted among German companies operating in the Western Balkans.

Similarly, foreign companies in the region indicated that they might be more likely to engage in collaborations with Western Balkan companies if those companies significantly decarbonized their operations. Around two-thirds of the foreign companies responded with either 'probably yes' or 'definitely yes' to this question, while an additional 29% were unsure. Only 8% said they probably or definitely wouldn't collaborate more with local companies (Figure 15). This suggests that decarbonization can also be a tool for enhancing cooperation between local and foreign companies in the Western Balkans.

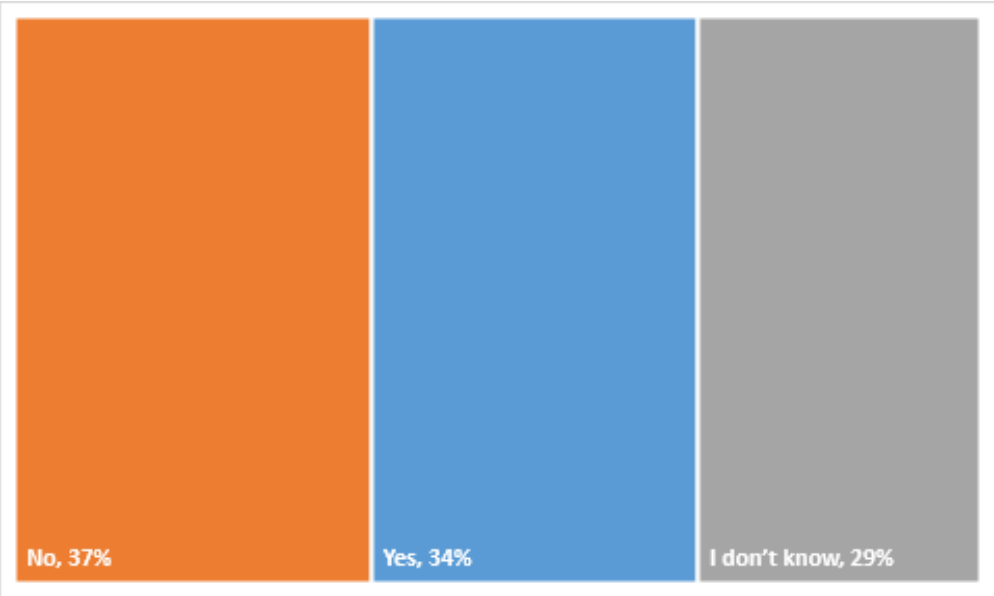
Figure 15 - Would your company be more likely to engage in collaborations with Western Balkan companies if they significantly decarbonized their operations?



Source: Survey conducted among German companies operating in the Western Balkans.

Turning to the CBAM, around third of the foreign companies say that their operations in the Western Balkans will be affected by it. Slightly more (37%) say that they won't be affected, while 29% of the companies said that they don't know (Figure 16).

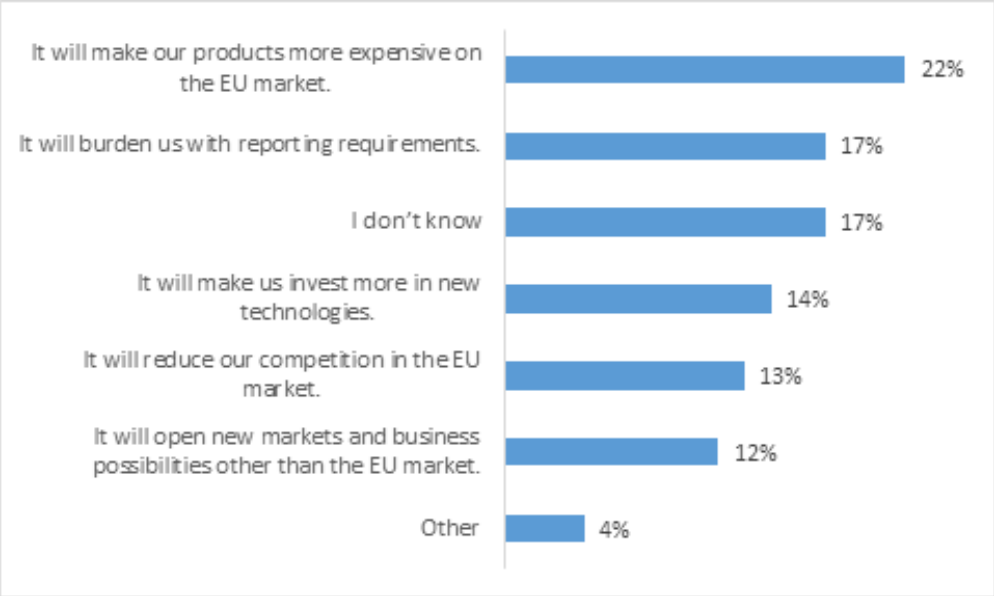
Figure 16 - Will the introduction of the EU CBAM, which will apply to the Western Balkan region as well, affect your operations in the region?



Source: Survey conducted among German companies operating in the Western Balkans.

When examining how the Carbon Border Adjustment Mechanism (CBAM) will affect the operations of foreign companies in the region, negative responses prevail, differing from the responses of local companies to the same question. Specifically, 22% of foreign companies said that the CBAM will make their products more expensive on the EU market, and 17% indicated that it will burden them with reporting requirements. Only 14% mentioned that it will lead them to invest more in new technologies, compared to 31% among local companies (Figure 17).

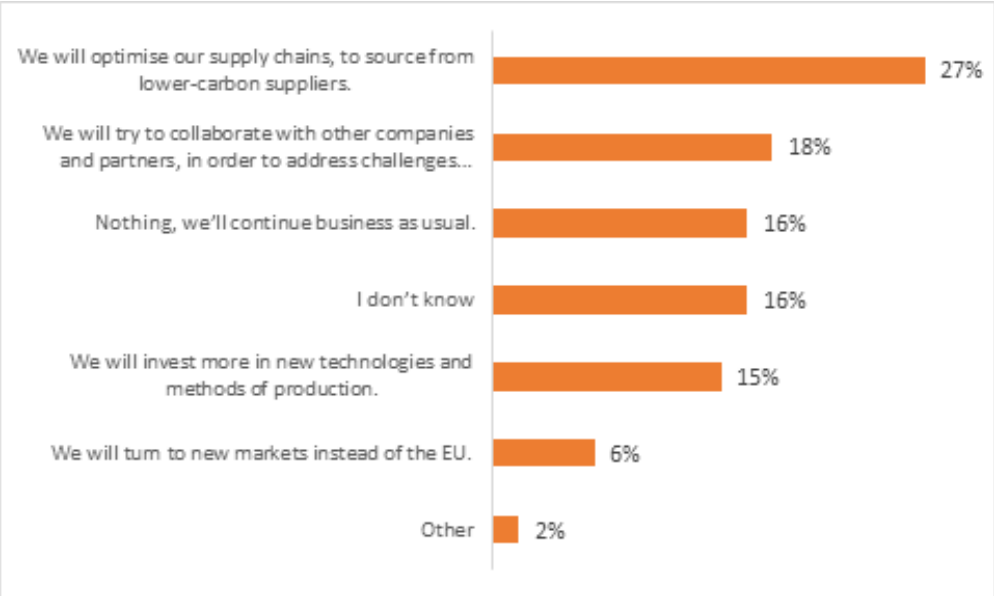
Figure 17 - Will the introduction of the EU CBAM, which will apply to the Western Balkan region as well, affect your operations in the region?



Source: Survey conducted among German companies operating in the Western Balkans.

Interesting differences emerge when comparing how local and foreign companies intend to react to the CBAM. Among foreign companies, the most common response (27%) was that they will optimize their supply chains. In contrast, the most common response among local companies was to invest in new technologies and methods of production (32%), a response that received only 15% of the foreign companies' votes (Figure 18). Another notable difference is that 16% of foreign companies said they won't do anything and will continue business as usual, compared to only 7% of local companies. These responses suggest that foreign companies have a more negative view of the CBAM and that their reactions are less proactive compared to local companies.

Figure 18 - What does your company intend to do because of the CBAM?



Source: Survey conducted among German companies operating in the Western Balkans.

REFERENCES

AFEP Study on Trade & Climate Change / Final Report, Qunatitative Assessment of the Best Policy Tools to Achieve Climate Neutrality and Competitivness, 2022

Allert, Verena, Larina Maryna, Glasser Anne, *Impacts of the EU Carbon Border Adjustment Mechanism on the Western Balkans and Ukraine: Policy options for Government, A Discussion paper*, Emission Trading Extra & German Watch, 2023

A.E. Yüzbasıoglu et al., *Decarbonization in ammonia production, new technological methods in industrial scale ammonia production and critical evaluations*, Heliyon 7 (2021)

Carbon Border Adjustment Mechanism eLearning module: CBAM in the fertilisers sector - Course Takeaways, European Commission, 2023

EEA, European Environment Agency, Greenhouse gas emissions under the EU emissions trading system, 2023, available at:
https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-under-the

Elshishini S, Product carbon footprint methodology for ammonia production by conventional steam reforming–A case study, European Journal of Sustainable Development Research, 2024, 8(1), em0241, e-ISSN: 2542-4742)

EPA, Unite States Environmental Agency Protection, Overview of Green Gases, 2024, available at:
https://www.epa.gov/ghgemissions/overview-greenhouse-gases

Ernst & Young, How tax departments should prepare for CBAM, Ernst & Young global, 2023,
available at:
https://www.ey.com/en_gl/insights/tax/how-tax-departments-should-prepare-for-cbam

European Roundtable on Climate Change and Sustainable Transition, Border Carbon Adjustments in the EU: Sectoral Deep Dive 2021, p 36, 37

Fertilizers Europe, 2023, available at:
https://www.fertilizerseurope.com/fitfor55-ets-cbam/

Guidance Document on CBAM Implementation for Installation Operator Outside the EU, available at:
https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en

ICC (2023), ICC proposals for effective carbon pricing: Leakage and linkage considerations.
https://iccwbo.org/news-publications/policies-reports/principles-and-proposals-for-effectivecarbon-pricing/

Karen Hansen-Kuhn, Carbon tariffs and fertilizers: Wrong fit for purpose, IATP'S GLASGOW SERIES, COP26, October 2021, Minneapolis, Washington D.C, Berlin iatp.org

KPMG, EU Carbon border adjustment mechanism, 2023, available at:
https://kpmg.com/rs/en/home/insights/2021/06/carbon-border-adjustment-mechanism-cbam.html

McDonald, Jeffrey, (2023), CBAM, ETS, reform impact fertilizer trade, S & P Global, available at:
https://www.spglobal.com/commodityinsights/en/market-insights/blogs/agriculture/020823-cbam-ets-impact-fertilizer-trade

Morgado Simoes, Henrique, *Carbon Border Adjustment Mechanism,* European Parliament Research Service, 2023

Official Journal of the European Union, of the 16.05.2023., starting from page 52, *Regularion EU 2023/956 of the European Parliament and the Council of 10th of May 2023, establishing a Carbon Border Adjustment Mehanism*

UNCTAD, (2021), A European Union Carbon Border Adjustment Mechanism: Implications for developing countries, United Nations Conference on Trade and Development, available at:
https://unctad.org/system/files/official-document/osginf2021d2_en.pdf