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PART 2/2

**COMMISSION STAFF WORKING DOCUMENT**

**IMPACT ASSESSMENT REPORT**

***Accompanying the document***

**Proposal for a Regulation of the European Parliament and of the Council**

**amending Regulation (EU) 2023/956 as regards the extension of its scope to downstream goods and anti-circumvention measures**

{COM(2025) 989 final} - {SEC(2025) 989 final} - {SWD(2025) 987 final} -
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# ANNEX 1: PROCEDURAL INFORMATION

## 1.1 Lead DG, D*e*cide Planning/CWP references

Lead Directorate-General: Taxation and the Customs Union (DG TAXUD)

Decide Planning Reference: PLAN/2025/1238

Other references: The initiative was announced in the Communication on a European Steel and Metals Action Plan, COM(2025) 125 final.

## 1.2 Organisation and timing

An interservice steering group assisted DG TAXUD in the preparation of this impact assessment report. The interservice steering group (ISSG) built on an existing group that had been set up to follow the various CBAM workstrands during the transitional phase. The ISSG group was consulted in writing on the call for evidence and the draft public consultation.

There were subsequently two meetings dedicated to the impact assessment report. The first meeting took place on 17 July 2025 and was attended by the following Directorates-General: SG, SJ, CLIMA, GROW, ECFIN, JRC, TRADE, MOVE, COMP, ENV, DEFIS, BUDG, INTPA, ENER. As announced in this meeting, DG TAXUD subsequently shared a draft of the impact assessment, which covered the first four chapters. A second meeting took place on 9 September to discuss the full draft impact assessment. It was attended by the following Directorates-General: SG, SJ, CLIMA, GROW, ECFIN, JRC, TRADE, MOVE, COMP, ENV, BUDG, INTPA, ENER, ENEST, EEAS. They received the draft ahead of the meeting and were given time to comment in writing.

## 1.3 Consultation of the RSB

On 17 September 2025, DG TAXUD submitted the draft Impact Assessment to the Regulatory Scrutiny Board and the Board meeting took place on 8 October 2025. The opinion of the Board, as issued on 10 October 2025, was positive with reservations.

The Board's recommendations have been addressed as presented below.

| **What to improve (RSB recommendations)** | **What was improved** |
|---|---|
| (1) The baseline should be further developed. It should include a well-substantiated dynamic scenario depicting how the situation would evolve in the medium and long term in the absence of the policy intervention. This should include a clear explanation of how the baseline has been established in terms of ETS induced carbon prices, and pricing | The discussion of the baseline (Section 5.1) explains more clearly how the three problems of downstream carbon leakage, CBAM avoidance and ineffective treatment of electricity imports would evolve in the medium- and long-term in the absence of further policy intervention. |

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| and quantities of goods produced and the related impact on downstream industries and consumers. The dynamic baseline should be quantified in order to allow to compare the main economic and environmental impacts of assessed policy options. | Annex 4 explains in more detail the modelling assumptions for the development of the carbon prices under the EU ETS and in the rest of the world that underpin the baseline. |
| (2) The report should provide a more granular analysis on the impact of the intervention in terms of prices faced by consumers and downstream producers. The report should better explain how the estimated significant impacts in terms of emissions correspond to expected changes of quantities and prices of basic as well as downstream goods, for both EU consumers and downstream producers. The effects should be disaggregated in order to analyse impacts on various groups of goods and in turn on various groups of stakeholders, both consumers and downstream industries. | Section 6.2.4.1 has been further developed to provide a more granular overview of the impacts, include the results of a sensitivity analysis and explain what is behind these price impacts. |
| (3) Regarding electricity, the report should better analyse the impacts of the use of the average electricity mix of the exporting country in terms of the change of the incentives to decarbonise and resulting overall environmental impacts regarding the total emissions. | Additional elements in relation to the impacts of the use of the average electricity mix have been added to section 6.4.1 of the report. |
| (4) The key assumptions and estimates, including prices and elasticities, used in the JRC-GEM-E3 modelling should be spelled out for different points of time, and limitations and uncertainty of results of modelling assessed, especially in the light of this being a new kind of initiative for which limited empirical evidence is available on which to base estimates. The report should better explain the methodology behind the circumvention analysis and the assumptions used in modelling the impact of measures on the electricity sector. Furthermore, the report should improve the methodology | Annex 4.1 has been amended to provide more information regarding the JRC-GEM-E3 model, including in terms of assumptions. The section on administrative burden (6.2.5)has been adjusted and expanded to improve the explanation on the methodology used for estimating the compliance costs for companies and enforcement costs for authorities. Section 6.4.4 on the administrative impacts of electricity has also been expanded. In addition, further details have been added to Annex 4.3 in order to better explain the methodology and modelling used for the assessment of |

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| regarding estimating administrative burden. | the impacts of the proposed measures for electricity. |
| (5) The verification mechanism related to actual values for embedded emissions needs to be clearly spelled out and the related risks and costs analysed. The analytical approach which will be used to determine any future empowerments should be clearly described. | Annex 9 has been amended to capture additional information on the verification process and its analytical approach. In particular, Annexes 9.1 and 9.4 discuss the criteria and conditions to be used for future empowerments. |
| (6) The indicators included in the monitoring and evaluation framework should be more granular and specific, based on clearer expectations, to allow an evaluation of the intervention's effectiveness and efficiency. The monitoring framework, as presented in the report, does not provide sufficient detail on the data necessary for tracking the impacts of the intervention. More detail should be provided regarding data on administrative costs and on the changes of emissions of third country producers of goods and electricity. | Section 9 has been expanded to improve the number and granularity of indicators that will be used for the evaluation of the effectiveness and efficiency of the proposed intervention. To support the collection of data on some of these indicators the Commission will run large scale international surveys to collect feedback from affected producers in these countries. |
| (7) Comparison of options should be based on clear criteria regarding effectiveness in line with the corresponding specific objectives for each of the three areas. Regarding efficiency the comparison should use the estimated costs including administrative costs and be based on benefit-cost ratios where possible. | Section 7.1 has been expanded to clarify the effectiveness, efficiency and proportionality indicators and criteria that have been used to assess the different options under consideration. |
| (8) The report, in particular the comparison of options chapter, needs to better explain how coherence with other relevant EU initiatives is to be ensured. | The coherence with other policies has been ensured in the analysis, and process-wise through the involvement of other DGs, as further explained in the report. |

More broadly, the measure around scrap have been further refined and streamlined to ensure it addresses the issue in an even more targeted fashion. In relation with abusive practices, an empowerment measure was introduced as a common feature of both options 1 and 2.

### 1.4 Evidence, sources and quality

The evidence base for this impact assessment report stems from a variety of sources, including:

- Targeted consultations with relevant economic operators and Member States.
- Public consultation and Call for Evidence.[1] Feedback period: 1 July 2025 to 26 August 2025.
- Exchanges with additional stakeholders through the CBAM Informal Expert Group Meetings and dedicated stakeholders' meetings.
- Data from the CBAM registry obtained during the transitional period.
- Support study on the CBAM scope extension to downstream products.
- Study on analytical methods for the calculation of embedded emissions in imported electricity to the EU under the CBAM.
- Modelling by the European Commission's Joint Research Centre.
- Desk research and quantitative analysis.

[1] See: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14748-Carbon-Border-Adjustment-Mechanism-CBAM-downstream-extension-anti-circuminvention-and-rules-on-electricity-emissions_en

# ANNEX 2 STAKEHOLDER CONSULTATION

## 2.1 Consultation strategy

The consultation strategy for the present initiative encompasses the following activities:

- Feedback to the Call for Evidence from 1 July 2025 to 26 August 2025;
- Public consultation from 1 July 2025 to 26 August 2025;
- Consultation of stakeholders in the context of studies dedicated to the downstream scope extension and electricity;
- Surveys of the National Competent authorities and Customs authorities in the context of the CBAM Risk Management Framework;
- Meetings of the CBAM Informal Expert Group, which brings together Member States, industry representatives, civil society representatives and observers from third countries and international or intergovernmental organisations;

This is further detailed below per area.

### *2.1.1 Downstream*

The Commission services have met on a continuous basis with various industry associations and companies affected by CBAM either directly or indirectly depending on their position on the value chain. Beyond bilateral consultations and exchanges, the Commission also engaged with stakeholders through the Informal Expert Group of CBAM.

Additionally, a targeted stakeholder survey was held in October 2024 as part of the downstream supporting study, which garnered 241 responses. This survey helped the Commission services estimate the administrative burden and compliance cost for downstream importers. Most respondents were manufacturers or importers of basic or downstream goods.

### *2.1.2 CBAM anti-avoidance*

The Commission services organised three dedicated workshops on CBAM Risk Management with National Competent Authorities and National Custom Authorities. Written submissions were also collected via surveys, including one dedicated to anti-circumvention. This allowed them to express in a structured manner their appreciation of the risks CBAM is exposed to. Whilst parts of the survey were structured, dedicated sections allowed for free text comments allowing to capture the description of new risks not discussed before.

The Commission services also gathered feedback through a number of industry events as well as bilateral meetings with private sector stakeholders. A material number of those mentioned the risk of abusive practices. Businesses also extensively highlighted the scrap loophole. European Aluminium[2] has notably published a study on the topic. A number of individual businesses have publicly shared their position on the matter such as Hydro[3] or Alcoa[4]. The cement industry[5] stressed in its submission the possible CBAM avoidance scheme in which an importer could import a product which is highly emission-intensive (e.g., with a high clinker content for cement) and later submit a CBAM declaration for this import, correctly using the same CN code but declaring low emissions (e.g. corresponding to a lower clinker content), resulting in a lower CBAM adjustment to be paid thus calling for increasing granularity in the reporting of CN codes.

#### *2.1.3 Electricity*

A selected stakeholder consultation was conducted as part of the study on electricity as a CBAM good. It included a structured survey sent to selected stakeholders in the electricity sector, yielding responses from suppliers, traders, transmission system operators (TSOs), interconnector operators, accreditation bodies, capacity-allocation platforms, power exchanges, and a regional market integration body. In addition, semi-structured interviews with national competent authorities (NCAs), customs authorities, and other actors were conducted.

The Commission services also gathered feedback from the industry and countries exporting electricity to the EU through bilateral encounters. Additionally, the industries (including TSOs and electricity traders) have publicly shared their position.

### 2.2 Call for evidence and public consultation

The Commission launched a call for evidence and public consultation (PC)[6] on 1 July 2025 and gathered responses until 26 August 2025.

The questionnaire consisted of 55 questions covering the three areas discussed in this impact assessment: downstream extension, CBAM avoidance and electricity. Stakeholders also had the opportunity to upload additional contributions. 34 questions were substantive, with additional questions asking for personal details or clarifications.

Below, we report the results of the consultation questionnaire, followed by an analysis of the position papers submitted in response to the consultation and call for evidence. A final section draws conclusions from both parts.

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[2] European Aluminium, Third party study on impact of CBAM on alumina and scrap markets, by Ramboll, March 2025

[3] Hydro, CBAM: Europe's low-carbon aluminium is threatened by a big loophole, https://www.hydro.com/en/global/about-hydro/stories-by-hydro/greenwashing-via-cbam-loophole

[4] Sandbag, Closing the CBAM scrap loophole – A critical move for climate , July 2024

[5] A Watertight Implementation of CBAM – Tackling the Risks of Fraud and Circumvention in the Cement Sector. Dec. 2024

### 2.2.1 *Consultation questionnaire synopsis*

#### 2.2.1.1 Profile of respondents

A total of **367 stakeholders** filled the PC questionnaire. Out of these 367 stakeholders, 114 responses belong to an identified campaign, while the remaining 253 stakeholders are not from an identified campaign. An overview of the respondents per country of origin is shown in Figure 1Figure 1Figure 1Figure 1Figure 1, and per stakeholder group in Figure 2. Over 81% of the respondents (n=206) are located within the EU, notably Germany (n=63) as well as Belgium (n=37) and France (n=28). From outside the EU, the most notable contributions are from respondents from Egypt, the United Kingdom and Ukraine. Most of the respondents are representatives of businesses/ organisations or business associations (84%; n=212). There are also contributions from EU citizens, public authorities, non-governmental organisations (NGOs), academic/research institutions, trade unions, environmental organisations and other organisations.

**Figure 1: Country of origin, all stakeholders (n=253) (Q11)**

All countries (n=253) EU only (n=206)

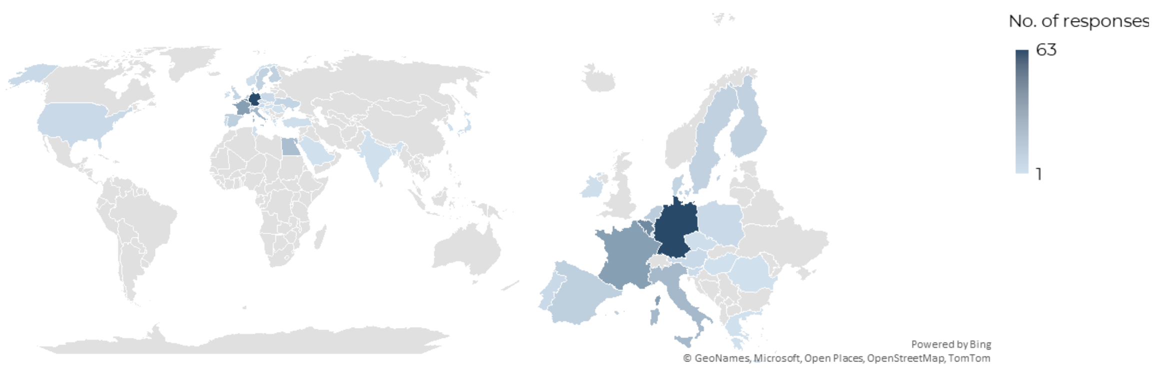
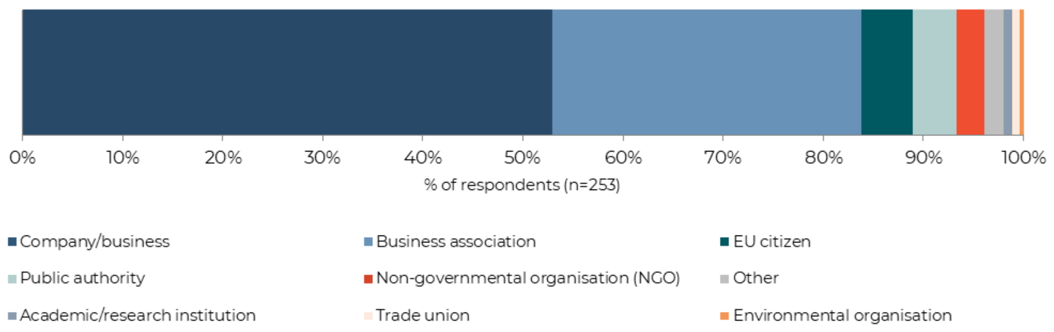
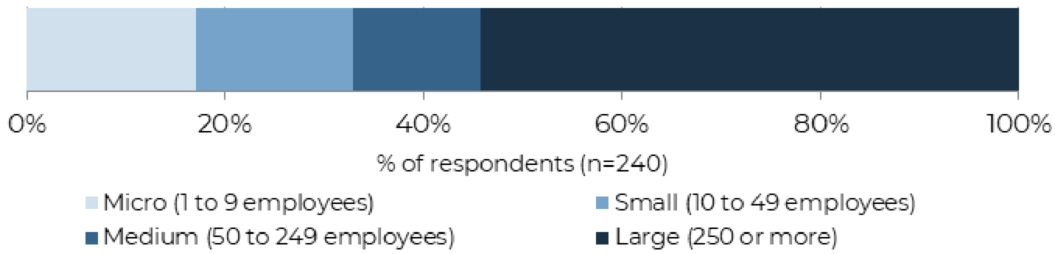



**Figure 2: Stakeholder type, all stakeholders (n=253) (Q2)**



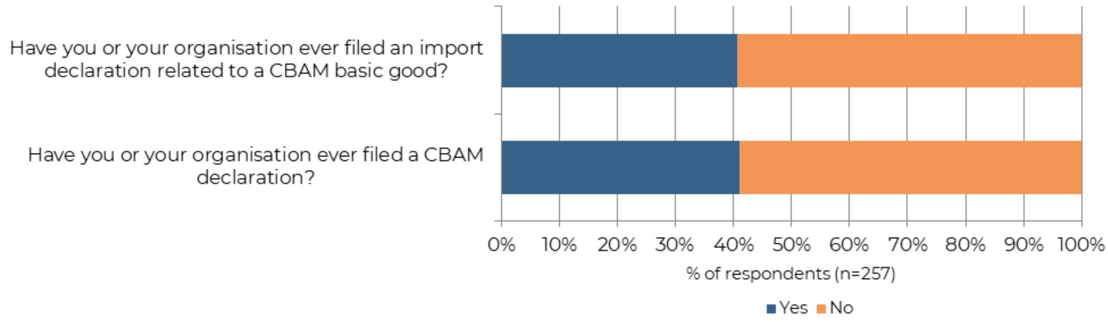

244 responses were provided by organisations, with large companies (250 employees or more) being the most represented (54%; n=130). 17% represent micro-organisations (n=41), 16% small organisations (n=38) and 13% medium-sized organisations (n=31).

**Figure 3: Organisation size, all stakeholders (n=240) (Q10)**




About 40% of the respondents have filed a CBAM declaration (n=104) or an import declaration related to a CBAM basic good (n=103) at least once, as shown in Figure 4.

**Figure 4: Filing of CBAM-related declarations (n=253) (Q13 & 14)**



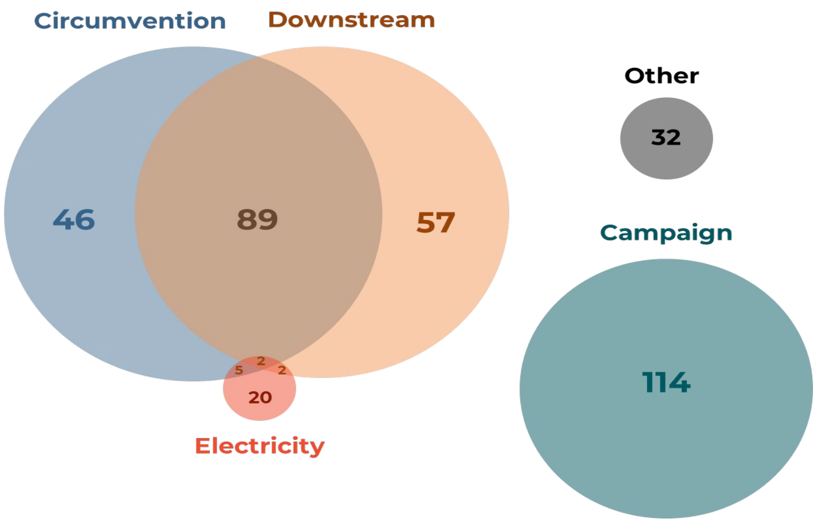
The consultation and call for evidence bring together three thematic strands: downstream, circumvention, and electricity. Because these topics are conceptually distinct, even if interrelated, the stakeholders responding to the survey are also heterogeneous, and usually only answer one of the three aspects. As such, the responses need to be analysed separately to draw meaningful conclusions. This avoids overreporting "no opinions" as well as unintentional and uninformed opinions, e.g. a German or Chinese producer of downstream goods commenting on CBAM electricity imports. Electricity imports do not usually involve downstream producers at all, because they happen between electricity importers and suppliers -i.e. electricity power plants in third countries. Since electricity imports require interconnector linking cross-border grids, they are only relevant at the EU ETS border in the context of CBAM, e.g., between Croatia and Bosnia and Herzegovina.

Therefore, three categories are used to define the PC stakeholders:

- Downstream stakeholders;
- Circumvention stakeholders; and
- Electricity stakeholders.

As shown in Figure 5Figure 5Figure 5, the **downstream and circumvention respondents widely overlap**, whereas the electricity responses are quite distinct. As per the Better Regulation Toolbox[7], campaigns are excluded and analysed separately. One campaign was identified, by a German manufacturing company, with 114 responses. The "other" category corresponds to stakeholders that are public authorities, citizens, NGOs, research institutions or consultancy companies.

**Figure 5: Venn diagram of the stakeholder types (n=367)[8]**




[7] European Commission (2023). Better Regulation Toolbox.

[8] - 89 stakeholders are categorised under circumvention and downstream. These are companies / business associations which cover trade and/or production of basic CBAM and downstream goods.
- 57 stakeholders are categorised as downstream only. These are companies / business associations which cover trade and/or production of downstream goods only.
- 46 stakeholders are categorised as circumvention only. These are companies / business associations which cover trade and/or production of basic CBAM goods only.

#### 2.2.1.2 Downstream stakeholders

In total, 150 responses are identified as downstream stakeholders.

Downstream stakeholders are respondents who are or represent producers/importers of downstream CBAM products. The selection process of downstream stakeholders is as follows:

- Firstly, downstream stakeholders are identified by whether they import or produce CBAM downstream goods (Q15 and 17). If respondents selected at least one product off an indicative list of downstream goods, they are considered a downstream stakeholder. 103 responses are identified as downstream stakeholders using this automatic filtering. Apart from the indicative list of downstream products, respondents could also indicate other downstream products (that they import or make) in free-text fields (Q16 and 18). These answers are manually analysed to include responses which provide viable responses (e.g. 'n/a' or 'no response' answers are disregarded). 8 responses are identified as downstream stakeholders using this manual filtering.
- Secondly, the responses also include organisations, which represent downstream producers/importers, but do not respond to Q15-18. For instance, a downstream manufacturing association does not produce/import themselves, but they do represent companies that do. The responses, which identify as company/business, business associations or trade associations, which are not yet categorised are manually screened and relevant organisations are included as downstream stakeholders. 39 responses are identified as downstream stakeholders using this manual filtering.

Most downstream stakeholders believe that carbon leakage due to CBAM occurs in downstream sectors to some extent, with 44% citing to a very large extent. They largely agree that extending CBAM to downstream goods would reduce carbon leakage, enhance EU climate policy, promote low-carbon innovation and encourage both EU consumption of low-carbon products and global carbon pricing efforts. Economically, while such an extension is expected to raise costs for manufacturers, SMEs and consumers, it is also seen as beneficial for EU employment. From an administrative point of view, most of the downstream stakeholders anticipate an increased burden mostly for EU imports and non-EU exporters of downstream goods, but also non-EU producers of downstream goods and public authorities. Reporting costs would be considered high particularly for determining embedded emissions and foreign carbon costs already paid.

Below is a more detailed description of the downstream stakeholders' views from the downstream goods section of the questionnaire.

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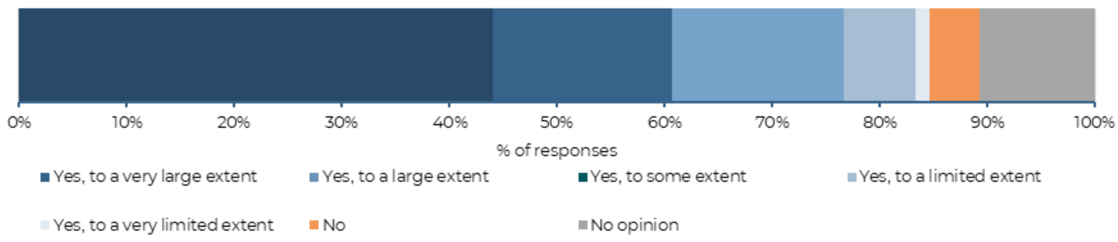
- 20 stakeholders are categorised as electricity only. These are stakeholders which represent EU/Non-EU TSOs, energy companies, and public authorities.
- 9 stakeholders are categorised as a combination of electricity stakeholder in combination with circumvention and/or downstream. These are mainly EU energy companies.
- The other 32 stakeholders include responses from 9 public authorities, 10 EU citizens, 4 NGOs, 3 research institutions, 5 consultancy companies, 1 retail association.

##### 2.2.1.2.1 Carbon leakage

The downstream extension addresses the risk of downstream carbon leakage due to CBAM on basic goods. According to downstream stakeholders, **carbon leakage due to CBAM does occur in downstream sectors**Figure . About three-quarters of the downstream stakeholders consider there to be carbon leakage at least to some extent (including very large extent (n= 66; 44%), large extent (n= 25; 17%) and some extent (n= 24; 16%)). 7% (n=10) say there is no carbon leakage in downstream sectors due to CBAM and 11% (n=16) have no opinion. The coordinated campaign reports that there is carbon leakage in downstream sectors to a very large extent due to CBAM. This broad stakeholder agreement that downstream carbon leakage occurs served as **impetus for the proposal to extend CBAM to downstream sectors**.

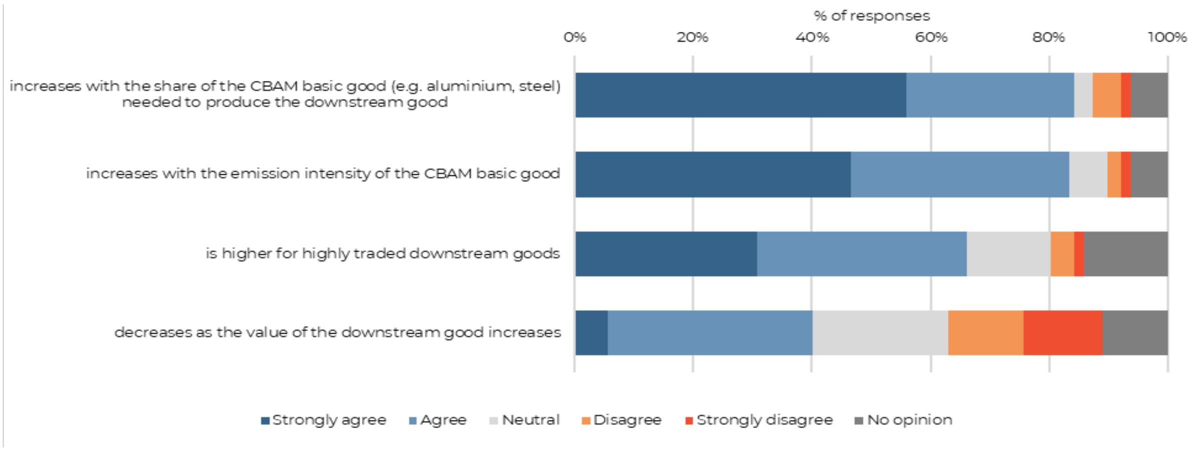
**Figure 6: Does carbon leakage due to CBAM occur in downstream sectors? (Q25 - downstream stakeholder responses only, n=150)**




The proposal reflects the fact that downstream leakage risk has several factors, based on stakeholder consultation. There is a strong consensus amongst downstream stakeholders that **the risk of carbon leakage increases with the share of CBAM basic goods needed to produce the downstream good and with the emission intensity of the CBAM basic good**: for the downstream stakeholders that reported that there is carbon leakage to downstream sectors, 84% (n=107) and 83% (n=106) agree or strongly agree, respectively (Figure 7Figure 7Figure ). Under the proposal, CBAM is due on the share of basic good, meaning that a higher share faces a higher CBAM and thus better protection against downstream leakage.

Moreover 66% (strongly) agree (n=84) that carbon leakage is higher for highly traded downstream goods. The proposal reflects this; downstream goods are selected based on how much they are traded, with higher trade intensity representing higher carbon leakage risk and need for scope inclusion. There is less consensus on whether carbon leakage decreases when the value of the downstream good increase (40% agree or strongly agree; n=51). The coordinated campaign (strongly agree) with all of the proposed consequences of the risk of carbon leakage.

**Figure 7: Do you think that the risk of carbon leakage: (Q26 - downstream stakeholder responses only, n=127)**



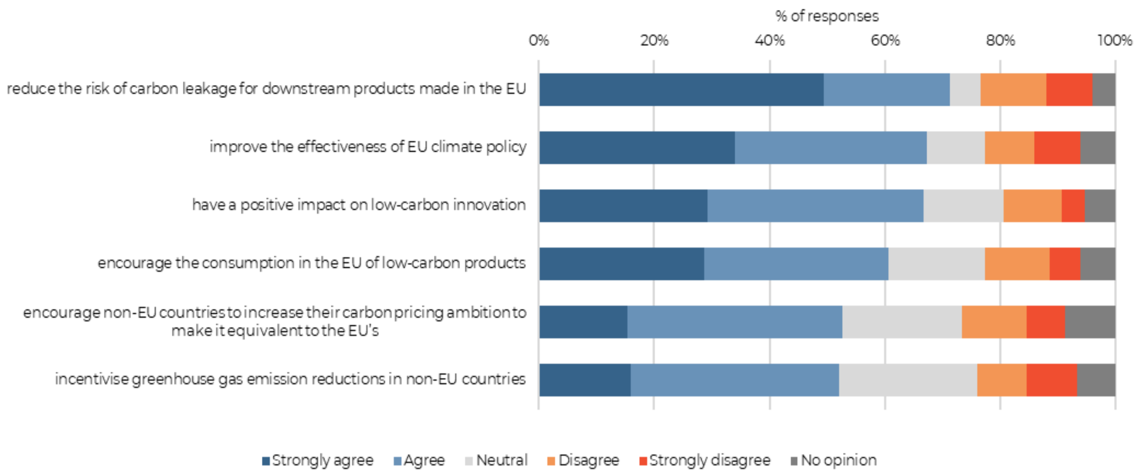

2.2.1.2.2 Climate impacts of extending the CBAM scope to downstream goods

The majority of downstream stakeholders agree that **extending the CBAM would have a positive climate impact** (Figure 8Figure 8). Namely, there is a strong consensus of the positive climate impact within the EU:

- 71% agree or strongly agree that such an extension would reduce the risk of carbon leakage for downstream products made in the EU (n=107);
- 67% agree or strongly agree that such an extension would improve the effectiveness of EU climate policy (n=101);
- 67% agree or strongly agree that such an extension would have a positive impact on low-carbon innovation (n=100);
- 61% agree or strongly agree that such an extension would encourage the consumption in the EU of low-carbon products (n=91);
- 53% agree or strongly agree that such an extension would encourage non-EU countries to increase their carbon pricing ambition to make it equivalent to the EU's (n=79); and
- 52% agree or strongly agree that such an extension would incentivise GHG emission reduction in non-EU countries (n=78).

The coordinated campaign strongly agrees with all six positive climate impacts above.

**Figure 8: Climate impacts: Extending the CBAM scope to downstream goods would: (Q27 - downstream stakeholder responses only, n=150)**



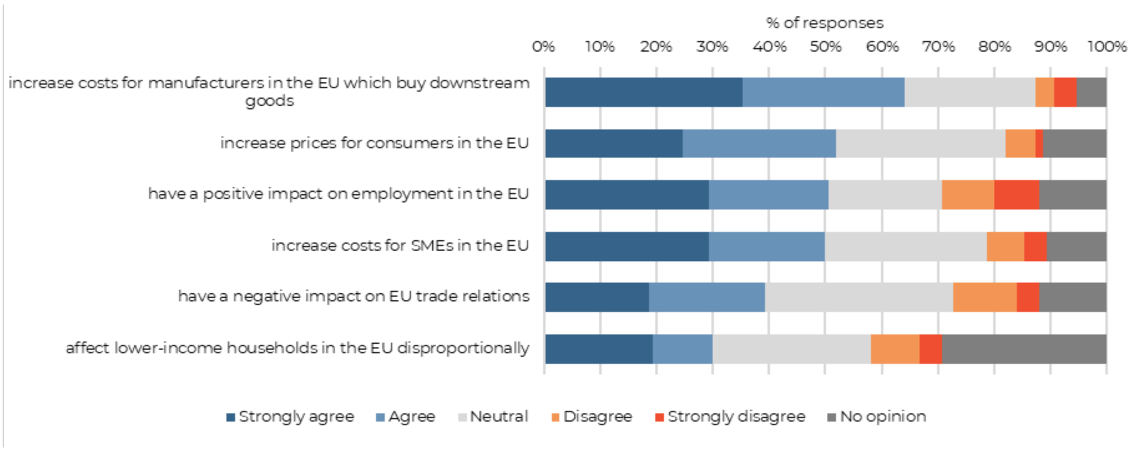

2.2.1.2.3 Economic impacts of extending the CBAM scope to downstream goods

The majority of downstream stakeholders agree that **extending the CBAM scope to downstream goods would increase i) costs for manufacturers buying downstream goods and ii) costs for SMEs in the EU as well as iii) prices for EU consumers** (64% (n=96), 52% (n=78) and 51% (n=76) agree or strong agree, respectively). At the same time, more than 50% of the respondents agree or strongly agree that such an extension would have a positive impact on employment in the EU (51% (n=76) agree or strongly agree). To limit the administrative burden, downstream options were **selected based on efficiency and proportionality** indicators (see Impact Assessment Section 8.1).

There is **less consensus amongst downstream stakeholders on the impact on EU trade relations and on low-income households**. 39% (n=59) of downstream stakeholders think that a downstream extension would have a negative impact on EU trade relations. 30% (n=45) of downstream stakeholders agree or strongly agree that a downstream extension would affect EU lower-income households disproportionately.

The coordinated campaign strongly agrees with the positive impact on employment and agrees with the increasing costs for downstream manufacturers and for SMEs in the EU.

**Figure 9: Economic impacts: Extending the CBAM scope to downstream goods would: (Q28 - downstream stakeholder responses only, n=146)**



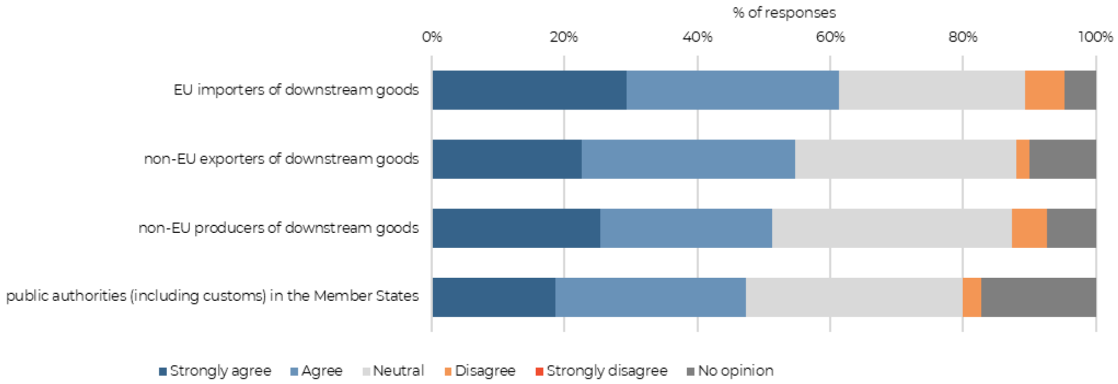

#### 2.2.1.2.4 Administrative burden from extending the CBAM scope to downstream goods

The majority of downstream stakeholders agree that **the downstream extension would significantly increase the administrative burden for EU importers, non-EU exporters and non-EU producers of downstream goods**:

- 62% agree or strongly agree that a downstream extension would significantly increase the administrative burden for EU importers of downstream goods (n=91);
- 55% agree or strongly agree that a downstream extension would significantly increase the administrative burden for non-EU exporters of downstream goods (n=81);
- 52% agree or strongly agree that a downstream extension would significantly increase the administrative burden for non-EU producers of downstream goods (n=76);
- 49% agree or strongly agree that a downstream extension would significantly increase the administrative burden for public authorities (n=71).

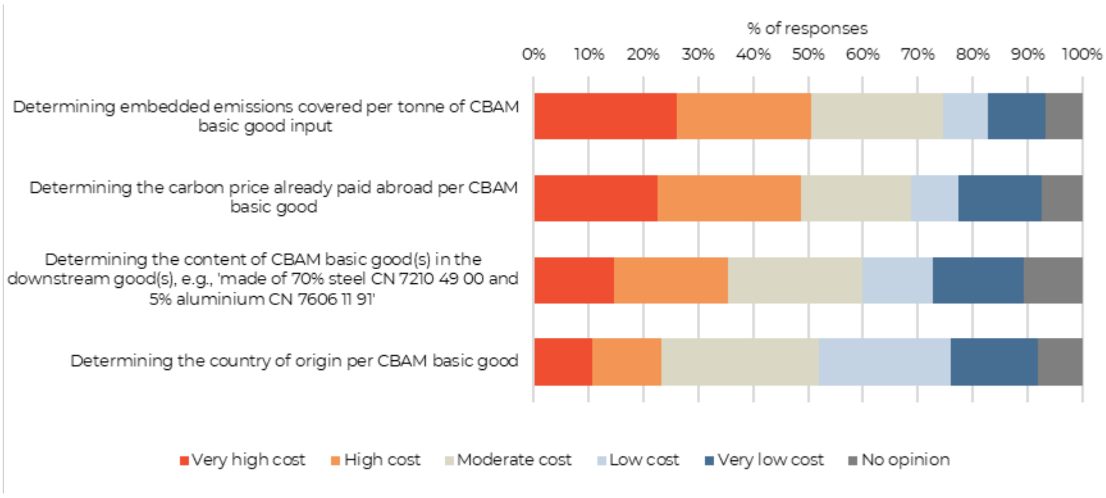
The coordinated campaign was mostly neutral with all four burdens listed above.

**Figure 10: How do you assess the following costs? Extending the CBAM scope to downstream goods would significantly increase the administrative burden from meeting the CBAM obligation for: (Q29 - downstream stakeholder responses only, n=146)**




For costs related to CBAM reporting requirements, about half of downstream stakeholders consider that **determining embedded emissions (51%; n=75) and carbon price already paid abroad (49%; n=72) would have high or very high costs**. Determining the content of CBAM basic goods in downstream goods and determining country of origin are considered to have relatively lower costs (36% (n=53) and 24% (n=35), respectively, indicate very high or high costs).

**Figure 11: For downstream goods, if and when they become part of the CBAM scope, how do you estimate the cost of the following CBAM reporting requirements in the CBAM definitive phase? (Q30 - downstream stakeholder responses only, n=146)**

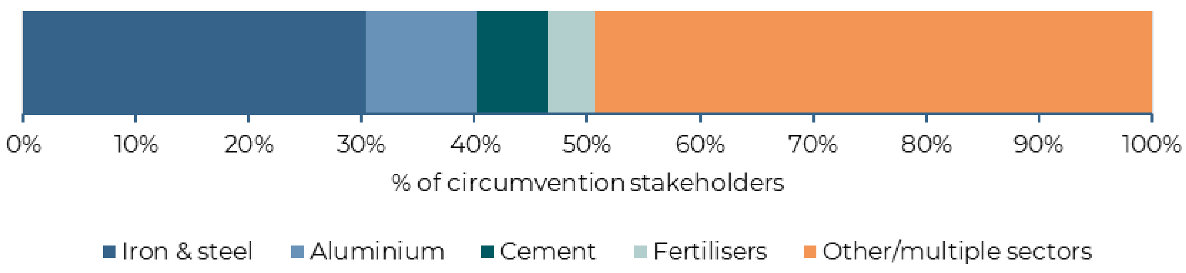



### 2.2.1.3 Circumvention stakeholders

There are a total of 142 stakeholders who are identified as circumvention stakeholders.

As shown in Figure 12, about 55% of the stakeholders (n=82) represent multiple/other sectors. This category is largely made of industry associations which represent multiple sectors, most of which are from the metal industry (n=41), but also multi-industry associations (n=17), chemical industry (n=6), mining industry (n=4) and energy industry (n=4). The remainder of the stakeholders represent, as shown in the graph below, iron & steel (28%; n=41), followed by aluminium (n=12), cement (n=8) and fertiliser (n=6).

**Figure 12: Circumvention stakeholders by sector (n=142)**




2.2.1.3.1 Risk of circumvention

Nearly 80% of stakeholders believe the current CBAM system is at risk of circumvention, which could undermine its effectiveness. This clear result served as **impetus for the proposal for additional anti-avoidance measures**. Among the five following causes - incorrect declarations of emission intensity, incorrect declaration of production details, mis-declaration of customs codes, lack of CBAM declarations, incorrect origin – the first two were flagged as most concerning. Furthermore, over 70% agree that variations in emissions within the same customs code contribute to circumvention risk. Proposed solutions like provision of more detailed information and refining customs nomenclature received similar support. Finally, a strong majority (82%) flagged specific risks including selective allocation of low-emission processes and electricity to EU-bound products as well as allocation/over-declaration of use of recycled content/metal scraps for production destined for the EU.

Below is a more detailed description of the circumvention stakeholders' views.

2.2.1.3.2 Current risk of circumvention

Almost 80% (n=111) of circumvention stakeholders either agree or strongly agree that under the current CBAM, there is a risk of circumvention that can hinder its effectivenessFigure 13). Out of 5 proposed channels, the main reported reasons for this risk are:

- Incorrect emission intensity declared (87% relevant or very relevant) (n=97);
- Incorrect details of production declared (85% relevant or very relevant) (n=94);
- Incorrect origin of CBAM basic goods declared (67% relevant or very relevant) (n=74).

50% (n=55) stakeholder believe that incorrect CN code declared is relevant or very relevant and 43% (n=48) for not making any CBAM declaration at all (Figure 14).

Respondents also mention the import of downstream goods which are not under CBAM (4 responses); lack of understanding of the (complex) system (3 responses); and abuse of inward processing rules (2 responses) and too coarse structure of CN codes (2 responses).

**Figure 13: Do you think that under the current CBAM, there is a risk of circumvention that can hinder its effectiveness? (Q31 - circumvention stakeholder responses only, n=142)**

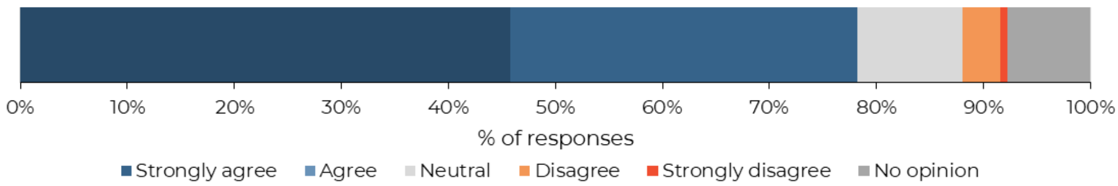
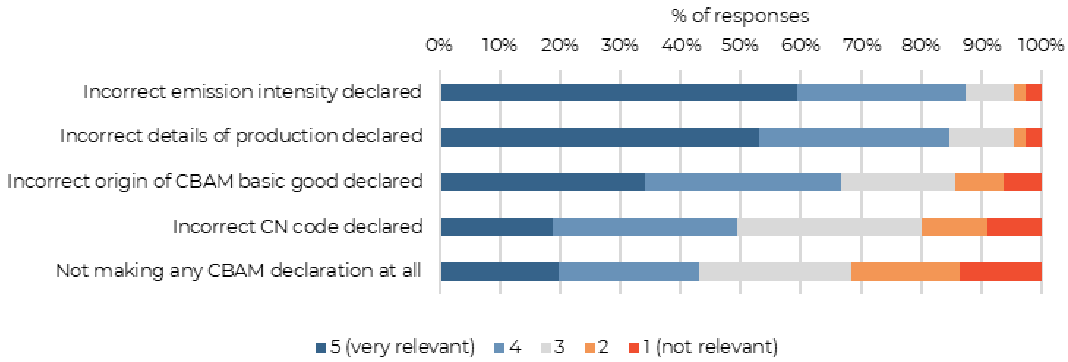



**Figure 14: What are the main reasons for the circumvention for CBAM basic goods under the current scope? (Q32 - circumvention stakeholder responses only, n=111)**




Over 70% (n=103) of circumvention stakeholders agree or strongly agree that the variation in embedded emissions within one CN code can lead to possible circumvention risk (Figure 15). In line with these industry worries, the Commission's anti-avoidance proposal includes an empowerment to further detail CN codes to capture composition within a given CN code (both option 1 and 2). On how to tackle this risk, 47% (n=48) agree or strongly agree that further details on information required in the CBAM registry (e.g. requiring additional information about the production technology and the composition of the goods) could be effective in reducing the circumvention risk. 43% (n=44) agree or strongly agree that further details on the customs goods nomenclature of CBAM would be effective. The underlying issues of heterogeneity of emission intensity for products falling within a given CN code, as well as traceability regarding the place of production, are shared by respondents and the two solutions seem equally important for stakeholders.

**Figure 15: For some CBAM basic goods, the embedded emissions can vary widely within the same CN code, depending on the composition of the goods or the production technology. Do you think that this leads to a possible circumvention risk? (Q34 – circumvention stakeholder responses only, n = 142)**

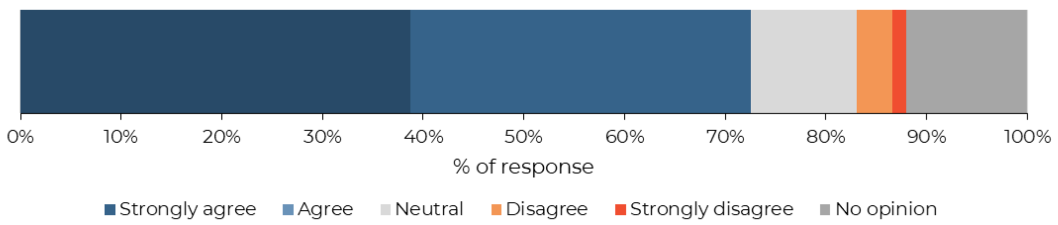
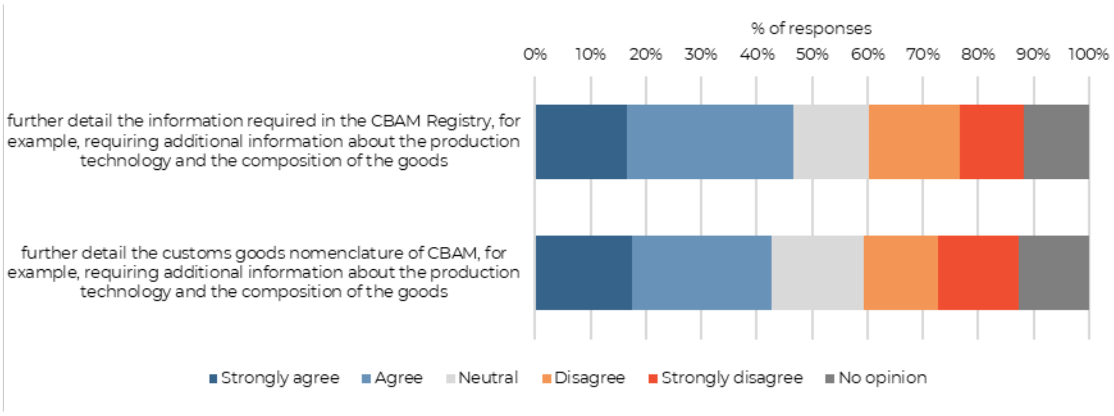
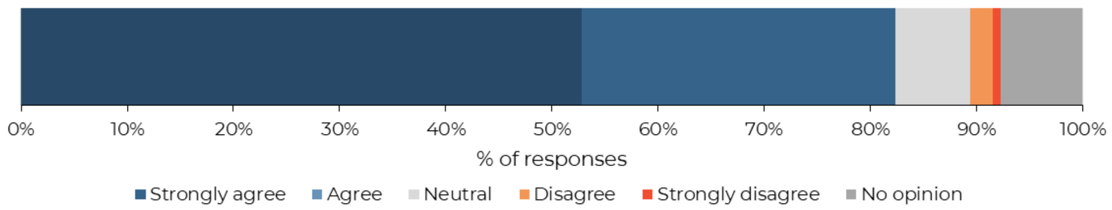


Figure 16: Do you think that the following proposals are effective in reducing the circumvention risk? (Q35 – circumvention stakeholder responses only, n = 103)




82% (n=117) agree or strongly agree that there is a risk of resource shuffling where non-EU producers of CBAM basic goods may not increase low-emission production capacity but instead reallocate existing clean production to export to the EU, while selling their high-emission CBAM products elsewhere.

**Figure 17: Do you think that there is a risk of resource shuffling where non-EU producers of CBAM basic goods may not increase low-emission production capacity but instead reallocate existing clean production to export to the EU, while selling their high-emission CBAM products elsewhere? (Q36 – circumvention stakeholder responses only, n = 142)**



#### 2.2.1.4 Electricity stakeholders

Most electricity stakeholders (90%, n=26) believe the current methodology to calculate the default values used in CBAM is inadequate to achieve the CBAM objectives, while the remaining 10% did not express an opinion. The overwhelming dissatisfaction with the current methodology provided an **impetus for the proposal to amend the rules for electricity as a CBAM good**. Improvements suggested by the stakeholders include using the full generation mix (including renewables) for the calculation of emission factors, using hourly data for the same purpose, and relying on transparent third-party sources for gathering the relevant data.

Moreover, a majority (69% of electricity stakeholders, n=19) supports amending the conditions for declaring actual values. All these 19 stakeholders unanimously agree that the criterion related to the power purchase agreements should be amended. Specific recommendations included allowing for intermediaries and/or guarantees of origin, or to align the definition of PPA with the definition provided in the Renewable Energy Directive. 18 stakeholders consider that the criterion requiring the proof of the absence of physical network congestion should be revised. The criteria related to the nomination of capacity, the requirement to prove the direct connections and the emission intensity threshold of the electricity plants are identified as needing amendment by respectively 13, 10 and 5 stakeholders. More details regarding the specific recommendations are provided in the sections below.

Stakeholders reported that they procure electricity through exchanges, bilateral contracts, and system operator arrangements, and submit customs declarations via various channels including by their own company, TSOs, and representatives. Reporting relies heavily on TSO data and purchase records. Key challenges mainly relate to CBAM implementation (e.g. regulatory uncertainty), unintended consequences on electricity trade (e.g. penalising unplanned electricity exchanges and emergency flows) and administrative burden (e.g. complexity for TSOs and high compliance costs). Recommendations made by the respondents include simplifying procedures, making verified emissions optional, and temporarily exempting UK electricity trade during the negotiations to link the UK and the EU's ETSs.

Below is a more detailed description of the electricity stakeholders' views from the section of the questionnaire on the application of CBAM to electricity as a good.

##### 2.2.1.4.1 Default values

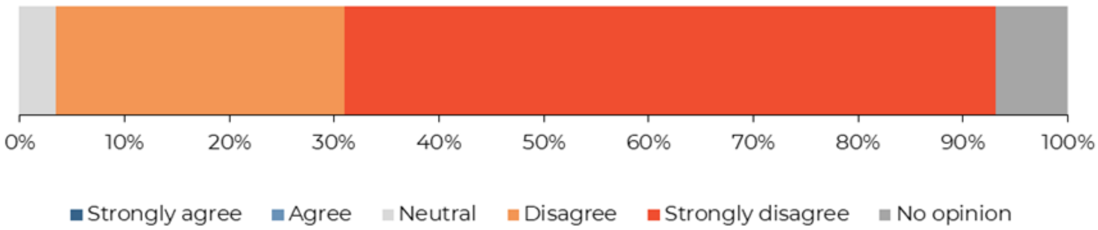
A significant majority of the electricity stakeholders (90%; n=26) disagree or strongly disagree that the current methodology to calculate the default values is adequate to achieve the CBAM objectives (Figure 1). Among the 26 respondents, 54% of them represented utilities (i.e. the electricity industry, excluding TSOs), 27% of the respondents were TSOs (EU and non-EU), 7.5% represented NGOs or a research institute, 7.5% of respondents were industry associations and 4% represented a public authority from a Member State.

The 26 respondents provided suggestions for alternative CO2 emission factor to improve upon the status quo, with the following main reflections:

- Full generation mix inclusion, not just fossil fuels, to avoid overestimating emissions and recognise decarbonisation efforts;

- Hourly or market time unit granularity to reflect actual conditions at the time of import;
- Use of actual data from TSOs or reliable third parties for transparency and public availability.

**Figure 18: Do you think that the current default values based on the CO2 emission factor (average of the electricity produced from fossil fuels) are adequate to achieve the CBAM objectives (prevention of carbon leakage, incentivisation of decarbonisation of non-EU production) (Q39 – electricity stakeholder responses only, n = 29)**




2.2.1.4.2 Conditions to declare actual values

Most electricity stakeholders think that the conditions for relying on actual emissions need to be amended (69% (n=20) agree or strongly agree) (Figure 19). Annex IV of the CBAM regulation sets out how a good's embedded emissions should be calculated. Among the 20 respondents, 55% of them represented utilities (excluding TSOs), 25% represented EU and non-EU TSOs, 10% represented industry associations and 5% represented a public authority from a Member State. Electricity stakeholders specifically suggested amendments for the conditions in Annex IV point 5 to be amended (Q42-43):

- Power purchase agreements (19 responses): 8 respondents (representing utilities) expressed the need to amend the definition of PPAs (notably to recognise the role of intermediaries and/or virtual PPAs, or to align with the definition of PPAs as provided in REDIII and recognise traceable certificates (e.g. GOs, RECs)). The current criterion is considered too restrictive or lacking clarity, and impractical for smaller importers or cross-border arrangements.
- Physical network congestion (18 responses): 7 stakeholders suggested to remove this criterion due to data unavailability on physical network congestion. Additionally, 4 of the respondents consider the condition as redundant when hourly matching between production and nomination is already required. There are concerns that real-time congestion data is not available, unpredictable, and managed by TSOs, not importers.
- Nomination of interconnector capacity (within same hour as electricity generation) (13 responses): There are suggestions to replace this criterion with final confirmed scheduled quantities from TSOs and extend the nomination window to reflect

actual trading practices. Strict hourly alignment is considered by some respondents unrealistic and not aligned with market operations.

- Direct connection (10 responses): Some stakeholders consider this requirement not feasible for cross-border electricity flows, where electricity is traded anonymously and repeatedly, making physical traceability impossible. There are suggestions to use market-based indicators instead.
- Emission intensity of generation plant <550 $gCO_2/kWh$ (5 responses): Stakeholders suggest that GOs/RECs should be allowed to be used as an alternative to verify emissions.

Some UK stakeholders mention that linking the EU and UK ETS would address some of these issues.

**Figure 19: Do you think that the conditions for relying on actual emissions need to be amended? (Q41 – electricity stakeholder responses only, n = 29)**

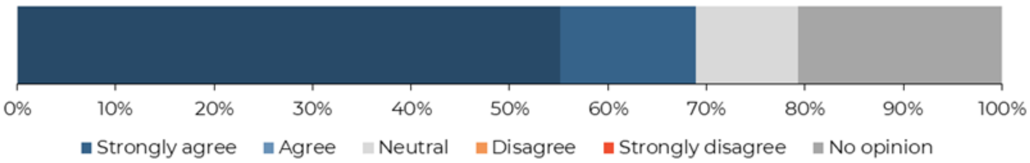
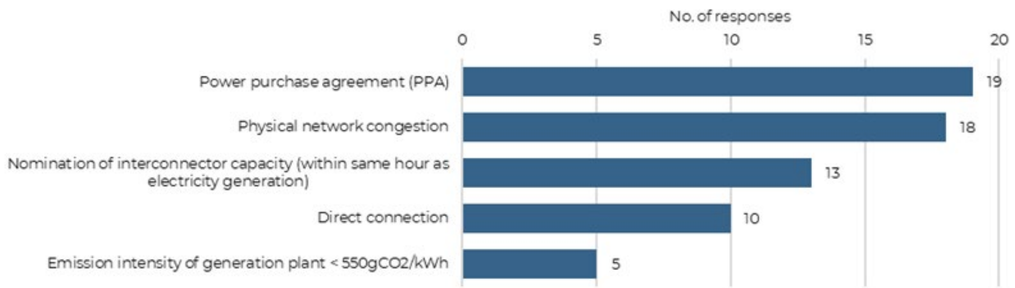



**Figure 20: Which of the conditions under Annex IV point 5 would you amend? (Q42 – electricity stakeholder responses only, n = 20)**

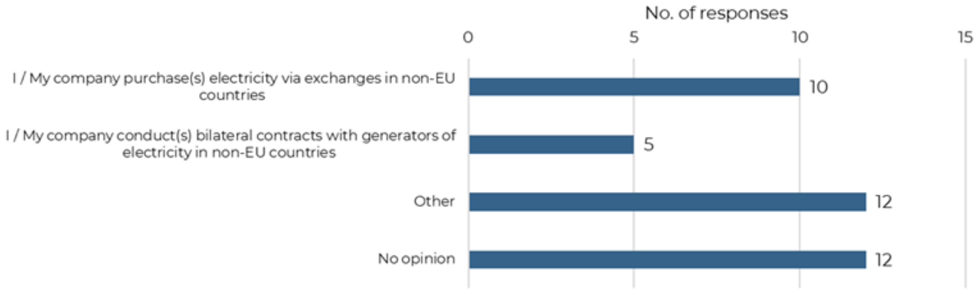



2.2.1.4.3 Electricity procurement and customs declaration

Electricity stakeholders procure their electricity abroad in various ways (Q44-45), as shown in Figure 2. The other responses include:

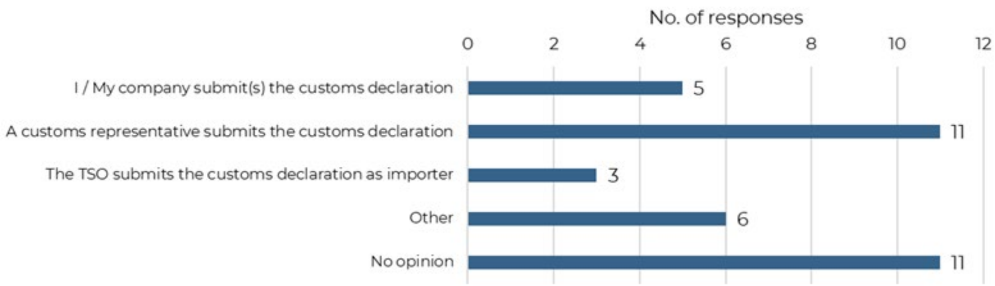
- TSO only imports energy to balance the system via mutual emergency assistance
- TSO performs system operator to system operator
- Procurement is via other TSOs, not generators themselves
- Bilateral contracts with traders
- Combination of purchased electricity via exchanges in non-EU countries and bilateral contracts

**Figure 21: How do you procure electricity abroad? (Q44 – electricity stakeholder responses only, n = 29)**




Electricity stakeholders also submit customs declarations for their electricity imports in various ways (Q46-47), as shown in Figure . Other ways include: combination of two or more of the above or a direct customs representation.

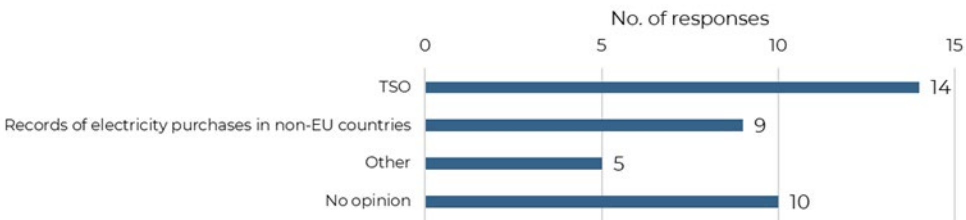
**Figure 22: Who submits the customs declaration for your electricity imports? (Q46 – electricity stakeholder responses only, n = 29)**




The electricity stakeholders rely on both TSOs and records of electricity purchases in non-EU countries to report the imported quantities (Q48-49), as shown in Figure 2. They also rely on:

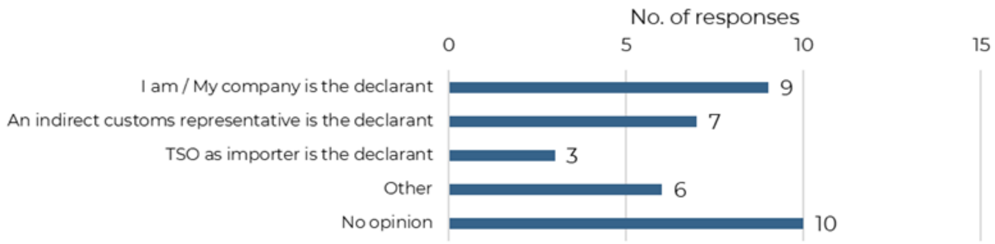
- Combination of both above
- SO-SO trade
- Market operators data
- Electricity Exchanges data.

**Figure 23: Who is the CBAM declarant for your electricity imports? (Q50 – electricity stakeholder responses only, n = 29)**



The electricity stakeholders declare their electricity imports for CBAM, themselves, an indirect customs representative, TSO as import or a combination of two or more of the above.

**Figure 184: Who submits the customs declaration for your electricity imports? (Q48 – electricity stakeholder responses only, n = 29)**




The electricity stakeholders identify the non-preferential country of origin in the following ways (Q52-53):

- Via records of my electricity purchases in non-EU countries (PPA, etc.) (3 responses)
- In the country where the electricity is purchased (7 responses)
- In the country from where the electricity was imported into the EU (12 responses)
- Other (1 response): in addition, nomination data is used.

#### 2.2.1.4.4 Additional challenges relating to the implementation of CBAM on electricity

Electricity stakeholders also provide information on the additional challenges in the administration of CBAM on electricity (18 responses; Q54):

- Challenges related to CBAM implementation
  - Regulatory uncertainty: respondents mentioned that most secondary legislation is still pending, including critical rules on carbon price deductions and default emissions values. This delays timely and accurate implementation.
  - Electricity transit: it is mentioned that there is a lack of clarity on how CBAM applies to electricity transiting through non-EU countries and re-entering the EU multiple times (n=4).
- Challenges for electricity trade
  - Unintended consequences: CBAM could risk penalising unplanned electricity exchanges and emergency flows, which are not commercial imports, but system operations.
  - UK-EU electricity trade: it is mentioned that although climate goals of EU and the UK are aligned, CBAM affects electricity trade.
- Challenges regarding the administrative burden
  - Complexity for TSOs: TSOs, especially those that do not import electricity, are said to face disproportionate compliance burdens. Their role is primarily grid operation and emergency support, not trade.

- High Compliance Costs: electricity stakeholders mention that importers and producers face complex registration, verification, and reporting requirements. It is said that default emission factors may unfairly penalise countries with proactive decarbonisation efforts.
- Volume Data Uncertainty: TSOs provide physical flow data, which may differ from nominated capacities. This creates ambiguity in how CBAM obligations should be calculated.

Electricity stakeholders also provide recommendations related to these challenges, including:

- Simplify Procedures: it is recommended to streamline proof of emissions (e.g., via PPAs) and adjust default factors to reflect actual energy mixes.
- Delay Extension: it is suggested that extending CBAM to downstream products and indirect emissions before 2026 is considered premature and risky.
- Use Default Values as Standard: it is recommended that verified emissions should be optional to reduce complexity and ensure consistency.
- Link EU-UK ETS: it is recommended that there be a temporary exemption for the UK during ongoing ETS negotiations to avoid market disruption.

### *2.2.2 Position paper results*

Stakeholders responded to the CfE with statements and position papers and attached position papers to their OPC submissions. All these are analysed below.

Most of the position papers and statements were provided by business associations or companies/businesses. Figure 19

**Figure 195: Stakeholder type, all position papers (n=285)**

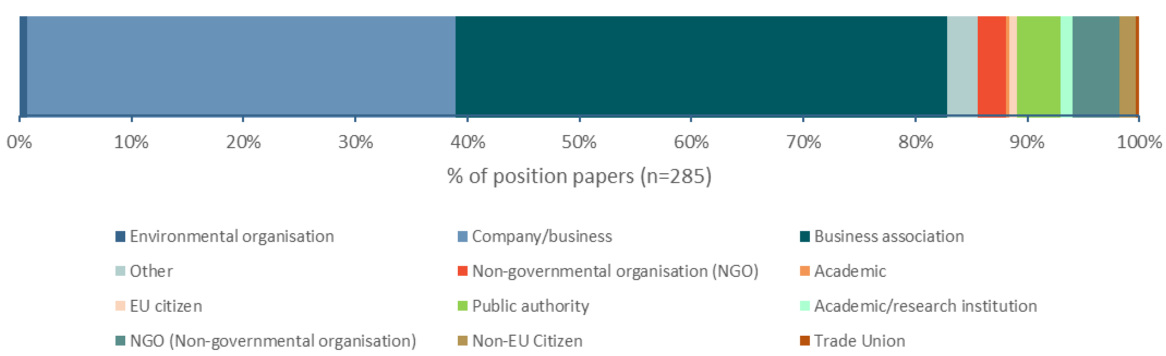
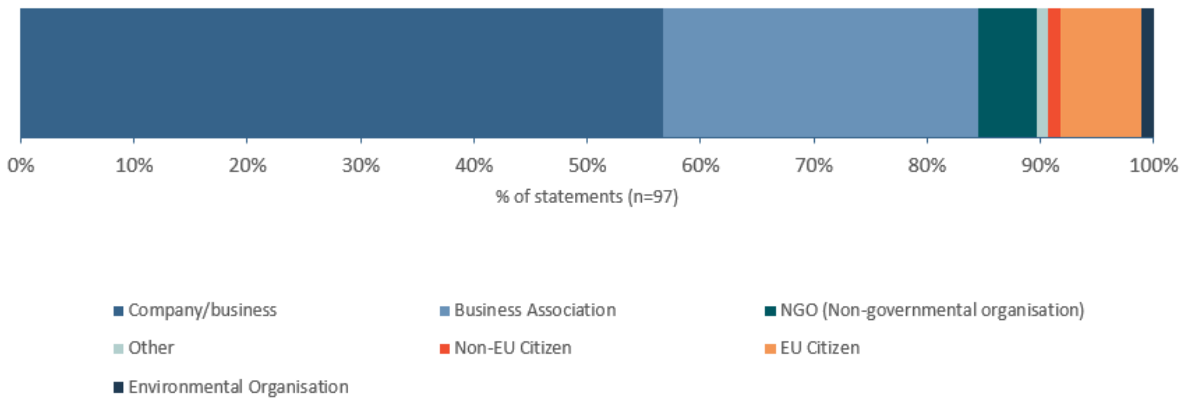


**Figure 206: Stakeholder types, all CfE statements (without attachments) (n=97)**




A significant segment of stakeholders providing position papers and/or statements support extending CBAM to downstream products and indirect emissions[9], citing fairness, environmental integrity, and the need to prevent carbon leakage. However, this support is often conditional, with concerns about implementation complexity, competitiveness, and unintended consequences. A few **core themes** were noticed across various sectors:

- **Carbon Leakage**: Excluding downstream products from the CBAM scope risks shifting production and emissions outside the EU, undermining climate goals
- **Fair Competition**: carbon leakage disadvantages EU industries, which face stricter environmental standards then their non-EU counterparts.
- **Circumvention Risks**: Tactics such as misclassification of goods, and minimal transformation are widely flagged. Stakeholders call for robust anti-circumvention safeguards, including traceability, default values, and harmonised verification systems.
- **Administrative Burden**: SMEs and complex supply chains face disproportionate compliance challenges. Simplified methodologies, digital tools, and phased implementation are recommended.
- **Environmental Integrity**: Partial CBAM coverage weakens climate objectives. Alignment with EU ETS, circular economy, and other climate policies is essential.
- **Sector-Specific Vulnerabilities**: Strategic sectors (e.g. automotive, defence, energy, chemicals) require tailored approaches. Some sectors (e.g. aluminium recycling, MedTech) warn of disruption and call for exemptions or impact assessments before implementation.
- **Legal & Trade Concerns**: WTO compatibility, double taxation, and lack of export compensation mechanisms are recurring issues. Stakeholders urge clarity, fairness, and international cooperation.

[9] Indirect emissions are beyond the scope of the impact assessment, despite some submissions on the matter.

- **Electricity & Scope 2 Emissions**: Inclusion of electricity raises concerns over default values, market distortion, and verification feasibility. Calls for reform and transitional arrangements are widespread.

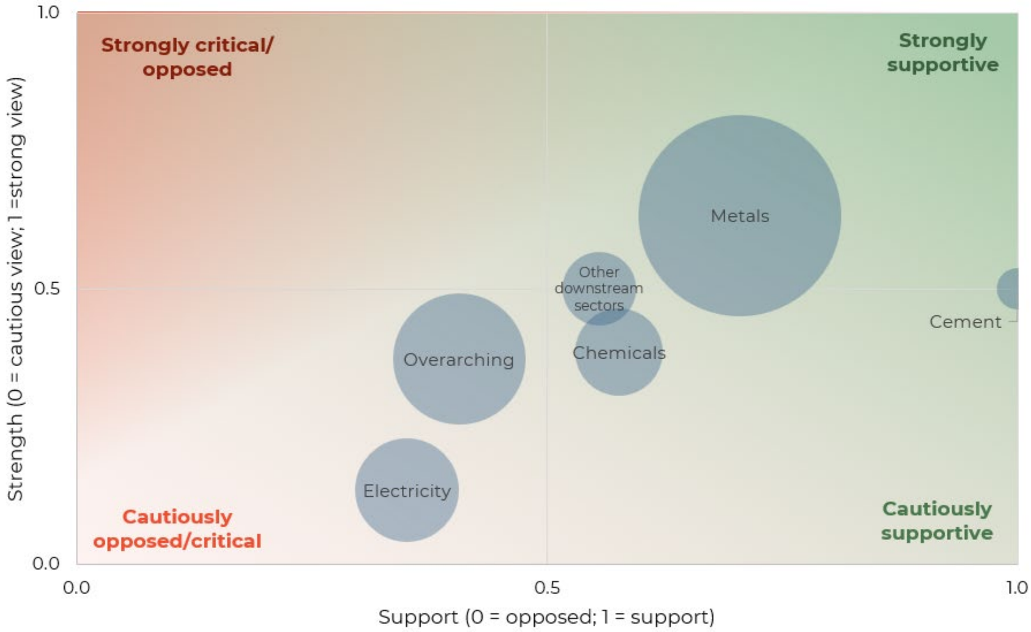
While processing the submissions, the responses are categorised based on their level of support for the extension of CBAM. The feedback covers all sectors currently in scope, and is not limited to steel and aluminium:

- **Strongly supportive (n=84):** overall an advocate of extending CBAM either in general or to specific sectors/products;
- **Cautiously supportive (n=74):** in general in support of extending CBAM, but raises concerns/suggestions on specific issues;
- **Cautiously critical/opposed (n=73)**: provides concerns and/or highlighting risks with the current CBAM framework and/or extension of CBAM. ; and
- **Strongly critical (n=45)**: clear opposition to the extension of CBAM either in general or to specific sectors/products.

The support to a downstream extension is quite different per sector, with the Metals sector being largely supportive. Below is an overview of the sentiment of each sector broadly based on the average standpoint for each sector. However, within each sector, there can be a variety of views:

- **The cement and metal industries are on average the most supportive of a downstream extension, though cautiously.** For the metal industry, there is a significant portion which are strongly supportive (50%), however, about a third is cautiously or strongly critical/opposed to a CBAM extension. All cement stakeholders are either strongly or cautiously supportive.
- **The chemical industry, other sectors, and overarching sectors tend to have an average *neutral* stance**, given that there is a diversity of perspectives within these sectors that represent a diversity of different (sub-)sectors with diverging views.
- **The electricity stakeholders tend to have the most critical views** of the specific rules under CBAM for electricity as a good. 14% strongly oppose the current treatment and methodology, and 86% are either cautiously supportive (35%) or critical/opposed (51%).

**Figure 217: Overview of average views of the CBAM extension to downstream goods, and of the current treatment of electricity as a CBAM good per stakeholder group**




*Note: the average views are estimated by taking the average value of all responses under one sector category for the two components: strength of view (strong=1; cautious=0) and support (supportive =1; critical/opposed = 0). The size of the bubble is in respect to the number of stakeholders within each sector.*

# ANNEX 3: WHO IS AFFECTED AND HOW?

## 3.1 Practical implications of the initiative

This initiative would primarily affect the following stakeholders:

- Private sector/industry.
- Public administration: National Competent Authorities for CBAM and Customs Authorities.
- EU citizens.
- Third countries, including developing and Least Developed Countries (LDCs)

**Private sector/industry**

The downstream extension will increase compliance costs for EU importers and their suppliers in third countries as more products are added to the scope of CBAM, resulting in an increased number of importers facing CBAM obligations. Importers of covered downstream goods will incur compliance costs resulting from, among others, tracking the origin of goods, collecting verified estimates of embedded emissions from suppliers, submitting CBAM declarations and purchasing and surrendering CBAM certificates. The additional recurrent compliance costs are estimated in a range between EUR 8 and 43 million for importers. Third country producers will also be impacted. Data on embedded emissions will still need to be collected and transferred along the value chain.. If information on actual values of emissions is not available, default values can still be used as is currently already the case in CBAM. Extension to downstream products will also prevent carbon leakage.

The additional anti-circumvention measures will improve enforcement mechanisms and thereby enhance the effectiveness of CBAM to achieve its intended outcomes. As such the underlying benefits of the measures can be understood to enhance confidence over the estimated impacts. The targeted additional reporting requirements -- to specify the goods composition for products within the same CN codes or to prove the place of production – would increase costs only to a negligeable extent since the importers are either familiar with existing mechanisms and required documentation, and due to its targeted nature toward specific CN codes/origins. The additional anti-circumvention measures will also address carbon leakage, ensuring that the reduction in anticipated carbon leakage will materialise.

The proposed modification of emission factors of electricity will lead to a reduction in the CBAM obligation for importers. The streamlining of conditions to report actual emissions is expected to further contribute to this reduction by facilitating the declaration of actual emissions in case of imports of electricity produced from renewables. Moreover, the changes of the conditions will reduce the reporting burden when actual emissions are declared compared to the current situation, as a result of a reduction in the number of conditions and clarification of the definitions used.

**Public administration, national competent authorities and customs authorities**

The downstream extension will lead to some increase in enforcement costs for National Competent Authorities and Customs Authorities. These authorities will have to deal with a higher number of products covered by CBAM and thus a higher total import volume of CBAM products. The additional compliance costs for NCAs and customs authorities are estimated to remain quite limited. The downstream extension will result in annual revenues of approximately EUR 0.58 billion a year by 2030.

Through additional anti-circumvention measures, the EU will benefit from a better protection of the expected revenue from CBAM, such that the anticipated revenues will actually materialise and will not be forgone or undercut. The additional reporting requirements are not expected to lead to material costs for administrations, due to their targeted nature for specific CN codes/origins and also given that they are already familiar with the required documentation and existing mechanisms.

No change of compliance costs for the National Competent Authorities is expected as a result of the proposed changes of the emission factor of electricity. The removal of the condition relating to network congestion is expected to result in lower administrative burden for all actors including competent authorities. It is plausible that the clarification of the conditions to report actual emissions will reduce implementation uncertainties, in turn leading to a decrease of administrative costs for national competent authorities.

**EU citizens**

The downstream extension will raise prices by negligible amounts. Price increases per sector are estimated below 0.1%, except for construction, where prices could rise by about 0.12%. However, it is important to note that this is an average increase in prices within the sector. EU citizens will benefit from a reduction in GHG emissions resulting from a downstream extension.

The additional anti-circumvention measures will allow a better protection of the environmental benefit of CBAM, such that the reduction in the anticipated GHG emissions will actually materialise, and EU citizens will benefit from a reduction in GHG emissions.

As far as electricity is concerned, the CBAM liability and all related administrative costs will ultimately be passed on to consumers, at least partially. The lowering of the CBAM obligation and the reduction in administrative costs associated with the changes of the rules for electricity are thus expected to lead to a lower cost of electricity although the impact has not been quantified.

**Third countries, including developing and Least developed countries (LDCs)**

The impact of a downstream extension affects third country exports of covered downstream goods to the EU. This leads overall to a minor decrease in EU imports from third countries.

LDCs are not among the main exporters of downstream products to the EU. At the same time some LDCs are producers of CBAM basic materials and depending on their positioning in global value chains some may be affected indirectly from the extension to downstream. Impact in this case will depend on emission intensity of production in these countries. On aggregate some LDCs may face losses, yet analysis also suggests that a few countries with relatively low emission intensity of production may also stand to gain market share. The change of the rules for electricity will not have an impact on LDCs as they do not export electricity to the EU.

Regarding electricity, the preferred option will better reflect the decarbonisation of the electricity generation mix in third countries and further incentivise third country operators to invest in clean technologies, compared to the baseline scenario.

### 3.2 Summary of costs and benefits

| I. Overview of Benefits (total for all provisions) – Preferred Option[10] | | |
|---|---|---|
| ***Description*** | ***Amount*** | ***Comments*** |
| | ***Direct benefits*** | |
| Supporting reduction in GHG emissions | Downstream: emission of CO2e in Mt estimated to decrease by 0.83 by 2035.<br><br>Anti-circumvention: Supports the achievement of impacts on carbon dioxide (CO2) emissions in the CBAM sectors in EU27 and rest of the world originally estimated in 2021 Impact Assessment ): -1.0% in the EU in 2030, -0.4% in the rest of the world in 2023. | Anti-circumvention: A better protection of the environmental benefit of CBAM with the anticipated reduction in GHG emissions. |
| Preventing carbon leakage in CBAM sectors | Downstream: carbon leakage in downstream sectors is reduced to 26% of a no-CBAM scenario.<br><br>Anti-circumvention: Supports the achievement of impacts originally estimated by 2021 Impact Assessment. Carbon leakage in CBAM sectors is brought down to -29 % in 2030 ). | Downstream: CBAM as currently legislated reduces carbon leakage in downstream sectors to 63% of a no-CBAM scenario. The downstream extension further reduces this to 26%.<br><br>Anti-circumvention: A better environmental integrity for the CBAM, to ensure a decrease in GHG emissions. |
| Revenue generation | Downstream: revenue generation of EUR 0.58 billion per year.<br><br>Anti-avoidance measures will also protect revenue by addressing the risk of misdeclaration of emission intensity, the scrap loophole and the risk of abusive practice to a material extent. | Downstream: reported revenue generation is estimate for 2030. Annual revenue expected to increase further to EUR 0.69 billion by 2035.<br><br>Anti-circumvention measure allows a better protection of the anticipated revenue of CBAM. |
| | ***Indirect benefits*** | |
| - | - | - |

| II. Overview of costs – Preferred option | | | | | | |
|---|---|---|---|---|---|---|
| | **Citizens/Consumers** | | **Businesses** | | **Administrations** | |
| | **One-off** | **Recurrent** | **One-off** | **Recurrent** | **One-off** | **Recurrent** |

10 Electricity was primarily assessed on a qualitative basis, hence quantitative estimates are not available

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Downstream | Direct adjustment costs | | For most products an increase of less than 0.1% in consumer prices. Construction sector prices for consumers increases the most, by 0.12%. | EUR 31 million | | | |
| | Direct administrative costs | | | | EUR 8 – 43 million per year | | |
| | Direct regulatory fees and charges | | | | | | |
| | Direct enforcement costs | | | | | | EUR 0.05 – 0.37 million per EU Member State per year. EUR 1.35 – 9.99 million in total. |
| | Indirect costs | | | | | | |
| Circumvention | Direct adjustment costs | | | | | | |
| | Direct administrative costs | | | | | | |
| | Direct regulatory fees and charges | | | | | | |
| | Direct enforcement costs | | | | | | |
| | Indirect costs | | | | | | |
| Electricity[11] | Direct adjustment costs | | | | | | |
| | Direct administrative costs | | | | | | |
| | Direct regulatory fees and charges | | | | | | |
| | Direct enforcement costs | | | | | | |
| | Indirect costs | | | | | | |

[11] Electricity was primarily assessed on a qualitative basis, hence quantitative estimates are not available

| III. Application of the 'one in, one out' approach – Preferred option(s) | | | |
|---|---|---|---|
| [M€] | **One-off**<br><br>(annualised total net present value over the relevant period) | **Recurrent**<br><br>(nominal values per year) | **Total** |
| **Businesses** | | | |
| New administrative burdens (INs) | | Downstream: EUR 8 – 43 million<br><br>Anti-circumvention: EUR 7.4 million per year | EUR 15.4 – 50.4 million |
| Removed administrative burdens (OUTs) | | | |
| ***Net administrative burdens**** | | EUR 15.4 – 50.4 million | |
| Adjustment costs** | Downstream: EUR 31 million | | |
| **Citizens** | | | |
| New administrative burdens (INs) | | | |
| Removed administrative burdens (OUTs) | | | |
| ***Net administrative burdens**** | | | |
| Adjustment costs** | | | |
| **Total administrative burdens***** | | EUR 15.4 – 50.4 million | |

## 3.3 Relevant sustainable development goals

| IV. Overview of relevant Sustainable Development Goals – Preferred Option(s) | | |
|---|---|---|
| **Relevant SDG** | **Expected progress towards the Goal** | **Comments** |
| SDG no. 13 – climate action | Prevent most downstream carbon leakage and circumvention | - |
| SDG no. 12 – responsible consumption and production | Downstream extension and anti-avoidance measures reduce pollution | - |
| SDG no. 9 – industry, innovation and infrastructure | Downstream extension and anti-avoidance measures promote sustainable industry in the EU and abroad | - |
| SDG no. 7 - affordable and clean energy | Changes in electricity rules lower the cost of electricity import | - |

# ANNEX 4: ECONOMIC ANALYTICAL METHODS

## 4.1 Downstream impact modelling

### *4.1.1 The JRC-GEM-E3 model*

The impacts of the downstream extension (section **Error! Reference source not found.**) were assessed using the JRC-GEM-E3 model (General Equilibrium Model for Economy-Energy-Environment).[12] JRC-GEM-E3 is a recursive dynamic computable general equilibrium (CGE) model and as such factors in the dynamic response to the dual cost push described in the problem definition (section **Error! Reference source not found.**). Being a global model, it covers the EU alongside 23 other major countries or world regions. With a detailed sectoral disaggregation of energy activities (from extraction to production to distribution sectors) as well as endogenous mechanisms to meet carbon emission constraints, JRC-GEM-E3 has been used extensively for the economic analysis of climate and energy policy impacts.

Divided into 38 sectors of activity, firms are cost-minimising with constant elasticity of substitution (CES) production functions. Sectors are interlinked by providing goods and services as intermediate production inputs to other sectors. Households are the owner of the factors of production (skilled and unskilled labour and capital) and thereby receive income, used to maximise utility through consumption. Government is considered exogenous, while bilateral trade flows are allowed between countries and regions using the Armington trade formulation where goods from different sectors are imperfect substitutes.[13] Key elasticities for the analysis of downstream extension are Armington elasticities, which are taken from the GTAP 11 circular economy database and range between 2.9 and 4.4 for sectors already covered by CBAM, and between 2.8 and 4.4 for the downstream sectors. In addition, the relevant parameters are (1) the elasticity that describes the substitutability between intermediates and the capital-labour-energy aggregate in the production function ($\sigma$=0.2), as well as (2) the elasticity that describes the substitutability between different intermediates ($\sigma$=0.25). Downstream products that are directly consumed by households are aggregated in a Leontief function into broader product categories for which demand is modelled in a linear expenditure system (LES).

In 5-year steps, an equilibrium is achieved at goods and services markets, and for factors of production through adjustments in prices.

The model integrates inputs from energy system models (PRIMES for EU Member States and POLES-JRC for the rest of the world) on a number of variables of interest, such as a detailed use of energy products by sectors and households, fuel prices, etc. to include in the baseline. The JRC-GEM-E3 model is then used to compare (various) policy options

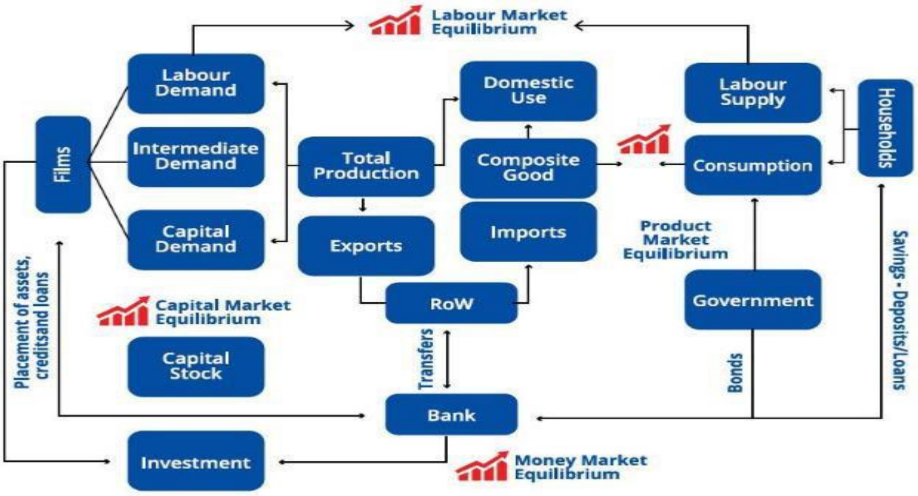
[12] See https://ec.europa.eu/jrc/en/gem-e3/model, including for a full documentation of the model.

[13] The Armington trade model is an economic model that assumes products from different countries are imperfect substitutes, a concept known as "national product differentiation". This assumption is widely used in computable general equilibrium (CGE) models to explain why countries simultaneously import and export similar goods. The model's key parameter is the Armington elasticity, which measures how easily consumers can substitute between domestic and imported goods. Armington, Paul S. (1969). "A Theory of Demand for Products Distinguished by Place of Production". *Staff Papers - International Monetary Fund*. **16** (1): 159.

against this baseline scenario, representing the evolution of the global economy under current energy and climate policies.

The JRC-GEM-E3 model is normally used to compare (various) policy options against a baseline scenario, representing the evolution of the global economy under current energy and climate policies.

**Figure 22: A schematic representation of the GEM-E3 model**




*Source: JRC-GEM-E3 model*

The model can be used to assess the impacts of the energy and climate policies on macroeconomic aggregates such as GDP and employment.

Sources for main data inputs:

- GTAP 11 circular economy database[14] (base year 2017) containing of Input Output tables, National Accounts, Institutional Transactions, Bilateral Trade, Taxes and tariffs.
- Consumption matrix to link household consumption by purpose to output of industrial sectors.
- Ageing Report and ILO: Employment, Unemployment rate
- PRIMES and POLES-JRC: Energy and emission projections

### *4.1.2 Adjustments to the JRC-GEM-E3 model*

To capture the effect on some important sectors for which CBAM might be applied, the sectoral granularity of the JRC-GEM-E3 model was improved for the purposes of the modelling analysis using the new GTAP 11 Circular Economy database, which explicitly

[14] Chepeliev (2025). Global Trade Analysis Project (GTAP) Circular Economy https://www.gtap.agecon.purdue.edu/events/GTAPVSS/v6n2-2025/GTAPVSS_v6n2.pdf Data Base. https://www.gtap.agecon.purdue.edu/events/GTAPVSS/v6n2-2025/GTAPVSS_v6n2.pdf See also Chepeliev et al. (2025) Circular Economy Transition in Europe Requires Ambitious Policies Beyond Climate Mitigation. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5175563

captures sectors subject to the EU CBAM. This exercise allowed for the model's underlying database to explicitly feature:

- aluminium
- fertilisers
- cement
- iron and steel (primary production, secondary production, and casting)

Compared to the standard GTAP 11 database, the GTAP 11 Circular Economy splits aluminium, fertilisers and cement sectors out of the more aggregate non-ferrous metals, chemicals, non-metallic minerals sectors, respectively. This dataset draws on several sources including trade statistics and thus captures differences in the input structure of these sectors as well as differences in the trade intensity.

Data checks with emissions reported under the EU ETS (using data from the EU Transaction Log) indicates that emissions generally are reasonably represented at EU level for the CBAM sectors, but some adjustments were made to the database for better harmonization.

For the assessment of downstream sectors, additional sectors typically aggregated into other sectors were represented individually in JRC-GEM-E3, such as fabricated metal products.

Due to the higher level of sectoral aggregation in the GTAP database compared to the CBAM Regulation, the JRC-GEM-E3 analysis maps the goods in a slightly different way. This is relevant for the impacts on emissions (section 6.2) and macroeconomic impacts (section 6.3.2.1), where "CBAM" is reported vs "Downstream".

#### *4.1.3 Baseline scenario: CBAM without downstream extension*

The baseline scenario is a scenario that follows current policies and trends, including the CBAM as currently legislated. The scenario includes the implementation of the policies from the Fit for 55 and REPowerEU packages that are already legislated. This includes the strengthening of the ETS, phasing out free allowances and phasing in CBAM. Following the scenarios that were developed for the 2040 climate target impact assessment,[15] carbon prices in the EU ETS are assumed to be $EUR_{2015}$ 115 and $EUR_{2015}$ 125 in 2030 and 2035, respectively. Carbon prices are an exogenous input parameter to a scenario without the phase out of free allowances and without the phase in of CBAM (No CBAM), but then adjust endogenously in the model in all other scenarios. This endogenous adjustment of carbon prices in the other scenarios is very minimal, leaving carbon prices essentially unchanged from the aforementioned 115 and 125 euro. This small endogenous adjustment of carbon prices is due to the small size of CBAM downstream imports compared to the total size of the EU sectors playing a role in ETS. Lower (higher) carbon prices would lead to a weaker (stronger) response in terms of imports, output, and emissions. The impact on leakage rates would be more uncertain, both when phasing out free allowances, as well as when introducing CBAM (including the extension to downstream products).

[15] Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society, European Commission, SWD(2024)63.

The rest of the world is assumed to follow a current policy scenario derived from the Global Energy and Climate Outlook 2024. This scenario assumes that third countries follow existing policies, but do not necessarily reach their National Determined Contributions (NDCs) under the Paris Agreement if these targets are not backed by specific policies. The UK and EFTA countries are assumed to have climate policy of equal stringency in place as the EU, e.g. a carbon price that is effectively paid equal to those in the EU ETS, hence there are no CBAM payments from these countries.

To reflect the role of ETS free allocations and the corresponding CBAM factor for imports of goods covered, an adjustment factor is applied to the emissions subject to CBAM in the JRC-GEM-E3 model. The factor is derived from CN code specific trade flows and corresponding emission intensities derived from a JRC study.

The current CBAM regulation already covers some products that are outside the basic CBAM sectors in the sectoral classification of the JRC-GEM-E3 model. In particular, about two thirds of emissions in the EU imports of fabricated metal products are already covered by the current legislation. This is reflected in the baseline scenario where a CBAM is levied on a share of the imports of fabricated metal products.

#### *4.1.4 Downstream scenarios (option 1, 2, 3)*

To assess the policy scenarios with a varying share of additional downstream coverage, the share of emissions originating from metals (steel and aluminum) production embodied in the trade of downstream products was implemented by using detailed trade data at product level. In a first step, the weight of the steel and aluminum content in the products covered by the policy scenarios was calculated, using assumptions for the share of these metals in each individual product group. The weight of CBAM metals in individual product groups (at CN code level) were then aggregated in the broader JRC-GEM-E3 sectors and this was used to attribute a share of the total emissions in the broader sectors to the products covered under CBAM.

The sectoral granularity of the JRC-GEM-E3 model remains more aggregate than the product groups of individual CN codes. This implies that the sectoral results provide an average of products that are covered and not covered under different policy options. Prices for individual goods with a higher metals share may thus be subject to higher price increases as shown by calculations at more disaggregated product level.[16]

#### *4.1.5 Variables, sectors, regions in the JRC-GEM-E3 model*

The model estimates a number of variables. For this analysis, the following are analysed, per CBAM and downstream sector: output, imports, export, investments, employment, $CO_2$ emissions and overall GHG emissions, and CBAM revenues. The sectors are listed in Table 1. By comparing the estimates for the "CBAM" (as is) scenario to the three downstream extension options, we obtain the estimated impact of the downstream extension.

[16] Stede, J., Pauliuk, S., Hardadi, G., & Neuhoff, K. (2021). Carbon pricing of basic materials: Incentives and risks for the value chain and consumers. *Ecological Economics*, *189*, 107168.

**Table 1: Sectors in the JRC-GEM-E3 model**

| Sectors in the JRC-GEM-E3 model | Power generation technologies modelled as sectors in the JRC-GEM-E3 model |
|---|---|
| **Ferrous metals** | Coal fired |
| **Cement** | Oil fired |
| **Fertilizer** | Gas fired |
| **Aluminium** | Nuclear |
| **Iron and steel casting** | Biomass |
| *Fabricated metal products* | Hydro |
| *Motor vehicles and parts* | Wind |
| *Other transport equipment* | Solar |
| *Other Equipment Goods* | |
| *Electronic products and electrical equipment* | |
| Coal | |
| Crude oil | |
| Oil | |
| Gas | |
| Electricity supply | |
| Non-ferrous metals | |
| Chemical products | |
| Plastics | |
| Paper products | |
| Non-metallic minerals | |
| Consumer goods industries | |
| Construction | |
| Transport (air) | |
| Transport (land) | |
| Transport (water) | |
| Market services | |
| Non-market services | |
| Crops | |
| Livestock | |
| Forestry | |

*Note: Sectors in bold are considered basic good sectors. Sectors in italics are considered for the downstream analysis. Part of the Fabricated Metal Products sector is already covered under the current CBAM Regulation.*

The model divides the world in 50 regions or countries (including the 27 EU member states) as reported in Table 2 below.

**Table 2: Regions in the JRC-GEM-E3 modelling**

| Code | Region |
|---|---|
| AFR | Other Africa |
| AUS | Australia |
| BRA | Brazil |

| | |
|---|---|
| CAN | Canada |
| CHE | Switzerland |
| CHN | China |
| EFA | Norway + Iceland |
| EUR | EU27 |
| GBR | United Kingdom |
| GLF | Gulf region |
| IND | India |
| JPN | Japan |
| KOR | South Korea |
| MEA | Middle East |
| MEX | Mexico |
| NOA | North Africa |
| OAM | Other Americas |
| OAS | Other Asia + Pacific |
| REU | Rest of Europe |
| RUS | Russian Federation |
| SAF | South Africa |
| TUR | Türkiye |
| UKR | Ukraine |
| USA | USA |

### 4.2 Downstream carbon leakage list: selection methodology

The analysis has assessed 1,560 Prodcom[17] codes, which have been identified to be downstream to current CBAM goods[18]. These Prodcom codes are then mapped to corresponding Combined Nomenclature (CN) codes.

For the selection of downstream goods at risk of carbon leakage two main filters were used. A **carbon leakage filter** and a **filter setting an EU production emission floor**.

The **carbon leakage filter** follows the approach taken by the EU ETS phase 3 and phase 4 carbon leakage indicators. Specifically, downstream leakage risk was determined both on the basis of **tradability** and **cost push** of goods.

**Tradability is proxied with the trade intensity**, which exactly mirrors the approach used by the EU ETS. For each downstream good, the trade intensity is obtained. For this, we use imports, exports and production data from Eurostat's Prodcom data for 2016-2023. We use the median value among these years.

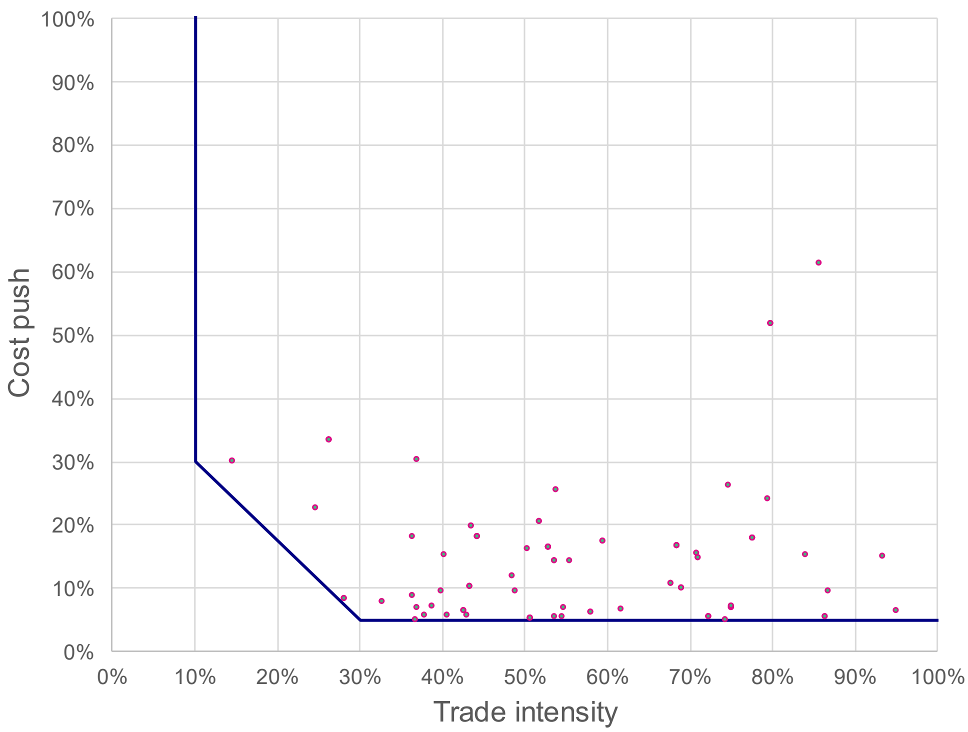
[17] *Production Communautaire* (Prodcom) classification for EU **industrial production,** where carbon leakage might occur, and the Combined Nomenclature (CN) system for **traded goods**, i.e., imports that might then be subjected to CBAM. We use the 2023 version.

[18] The following downstream products are considered out-of-scope. 1. Downstream "products" of electricity as its emissions are considered 'indirect emissions', thereby decoupling electricity from the consideration of value chains. 2. Downstream "products" of hydrogen and ammonia when used as a fuel and downstream products that could be used to "carry" hydrogen.

The **cost push**, in turn, stands in analogy to the emission intensity in the ETS CLI formula. It is estimated at Prodcom level and then mapped to CN codes. In other words, economic activity data is mapped to trade data, since emissions data are generally measured at economic activity level, while CBAM applies at trade level. Like for trade intensity, we used the median in the range of years. The cost push is derived from the emissions that go into total weight of the downstream good $i$, per euro of gross value added, multiplied by the projected effective carbon price in the 2030 (reference year). The higher the value added, the less of a marginal impact the cost push will have on competitiveness. For the calculation of the cost push emission intensities are drawn from the JRC (Vidovic et al. 2023) and estimates of product composition from a database available in the downstream study (Stede et al. 2021).

As shown below, the carbon leakage filter excludes all goods to the bottom left of a kinked line. Reflecting the example of Option 2 the line below represents a minimum 5% trade intensity (x-axis) and a minimum 10% cost push (y-axis). The diagonal in the bottom-left corner reflects the fact that goods with both low trade intensity and small cost push face a negligible carbon leakage risk. This approximates the multiplicative approach chosen by the ETS phase 4,[19] while providing a simpler selection approach than the multiplication.

**Figure 23: Carbon leakage filter in the example of option 2**




The **EU production emission floor** is applied to reflect the relevance of emissions in the EU at Prodcom code level. It is calculated on the basis of production sold in the EU, multiplied by the material content of downstream good per basic good material and the emission intensity of that basic material.

[19] The ETS carbon leakage list thus would have a curved line sloping down from left to right.

All formulas and variables corresponding to the filters are presented in the tables below.

**Table 3: Filters used to identify downstream goods at risk of carbon leakage**

| Filter | Formula |
|---|---|
| **Trade intensity** (carbon leakage risk filter) | $\frac{MVAL + XVAL}{MVAL + PVAL}$ in euros at Prodcom level. |
| **Cost push** (carbon leakage risk filter) | $= \frac{\text{Carbon costs induced by CBAM}}{\text{gross value added indicator}}$ $= \frac{PRODEM_i \times p_{ETS}}{PVAL_{Prodcom} \times \frac{GVA_{NACE}}{Turnover_{NACE}}}$ in euros at Prodcom level. |
| **EU production emissions** (emission floor) | $PRODEM_i = \sum_{m=1}^{3} (MC_m \times EI_m) \times UNITW_i \times PQNT_i$ At Prodcom level. |

**Table 4: Variable names per downstream good $i$, basic good material $m$, in euro or mass**

| Variable | Subscript | Description | Unit level |
|---|---|---|---|
| $\boldsymbol{MVAL}$ $\boldsymbol{MQNT}$ | $i$ | Imports into the EU27, in euro value or mass | Prodcom |
| $\boldsymbol{XVAL}$ $\boldsymbol{XQNT}$ | $i$ | Exports from the EU27 to the rest of the world, in euro value or mass | Prodcom |
| $\boldsymbol{PVAL}$ $\boldsymbol{PQNT}$ | $i$ | Production sold in the EU27, in euro value or mass | Prodcom |
| $\boldsymbol{PRODEM}$ | $i$ | EU production emissions, in tonnes of CO2e | Prodcom |
| $\boldsymbol{MC}$ | $m$ | Material content of downstream good $m$ per basic good material $m$ (steel, aluminium, cement) in kg per kg | Prodcom |
| $\boldsymbol{UNITW}$ | $i$ | Unit weight per production unit (kg) | Prodcom |
| $\boldsymbol{p_{ETS}}$ | - | Effective carbon price for 2030, in euro per tonnes of CO2e | - |
| $\boldsymbol{GVA}$ | $i$ | Gross value added, in euro | NACE |

| | | |
|---|---|---|
| $\boldsymbol{EI}$ | $m$ | Emission intensity in kg per kg.[20] From JRC (2023, Vidovic et al.),[21]-. An annual average improvement is assumed per sector for the modelling of emissions: Iron and steel: -1% yearly, Aluminium: -1.5% yearly, Cement: -1% yearly and Fertilisers: -2% yearly[22]. |

Note: NACE 2.1, Prodcom 2023.

The reference year chosen to assess the risk of carbon leakage to downstream goods is 2030. This was done to strike a balance between the time it will take before CBAM will have a substantial impact on the carbon cost (CBAM is only phased in in a limited way from 2026 to 2029) and the loss of representativeness of current data when the impact of CBAM is considered in the future. In addition, the year 2030 is relevant because it represents the time horizon for the EU's current Fit-for-55 climate policy framework, which is geared towards achieving the 2030 climate targets.

### 4.3 Electricity

The analysis of the impact of different default values for imported electricity on key performance indicators (KPIs) is based on the original modelling runs for the 2021 Impact Assessment. A detailed methodology of the modelling exercise can be found in Annex 4 of SWD(2021) 643 final (Part 2/2).

The Commission had employed the PRIMES electricity sector model to conduct a sequence of simulation runs altering the method of calculating the CBAM default values for electricity imports from non-EU countries within the system parameters. The objective was to assess  the impacts on key performance indicators, such as CO2 emissions, net electricity imports, power generation, and system costs.

The PRIMES power sector model simulates optimal expansion and operation of the power system and handles power exchanges over the interconnection system simultaneously. The simulation includes fully all the EU countries, the UK, Norway, Switzerland and the Energy Community contracting countries (with the exception of Georgia as there are no power links with the EU). Demand for electricity is given, as projected for the MIX55 scenario which achieves the EU climate targets, including the 55% reduction by 2030 (vs 1990) and net-zero by 2050.

The baseline of that assessment was consistent with all other exercises under the ‘Fit for 55 Package’. For the assessment of some impacts of ETS revision options, an ETS price

[20] Stede et al. (2021) database, expanded in the contractor study. Full citation: Jan Stede, Stefan Pauliuk, Gilang Hardadi, Karsten Neuhoff, *Carbon pricing of basic materials: Incentives and risks for the value chain and consumers*, Ecological Economics, Volume 189, 2021, 107168, https://doi.org/10.1016/j.ecolecon.2021.107168.

[21] JRC (2023): Vidovic, D., Zore, L., Moya, J. A. and Marmier, A., *Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners*, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2760/359533

[22] These are dawn from Table 43 in the Annex to the Proposal for the revision of the EU ETS 2021. https://eur-lex.europa.eu/resource.html?uri=cellar:7b89687a-eec6-11eb-a71c-01aa75ed71a1.0001.01/DOC_2&format=PDF

of EUR 35/t $CO_2$ was assumed for 2025, EUR 45/t $CO_2$ for 2030, and EUR 110 t for 2035, in 2015 prices. These were also the assumptions used in the present exercise, which builds on the results of the 2021 assessment, thus incorporating the dynamics of carbon pricing over time.

The MIX55 scenario is based on a comprehensive PRIMES energy system modelling exercise. In the model, consumers get utility using energy and non-energy goods and services, including energy efficiency as a means of meeting energy demand. Producers of energy carriers, such as electricity, use a combination of fossil fuels and clean energy to efficiently generate quantities needed by consumers. They set prices of energy carriers to reflect total production costs which are directly affected by the carbon price. Consumers are price takers but price-elastic. Note that PRIMES is not solely based on overall elasticities but on a structural representation of demand and supply. The PRIMES results also show asymmetry of responses for decreasing or increasing energy costs and prices.

The results from the MIX55 scenario, including energy demand and the ETS carbon price trajectory, were used as input to the PRIMES power sector model. In general, carbon pricing plays a crucial role in techno-economic power sector models by influencing decision-making, investment strategies, and operational behaviors within the model. It employs a cost optimization strategy, with the primary objective of minimizing power system costs. The ETS carbon price has a direct effect on variable operational expenditures of power plants, therefore affecting the dispatch of power plants.

After projecting capacity expansion, operation and flows, the PRIMES power sector model calculates costs and revenues following a simulation of stylised wholesale markets. The model calculates total power generation costs within each projection case by including all kinds of power sector costs. These include annual equivalent costs of capital, maintenance and operation costs and expenditures for non-fuel variable costs, fuel costs, tax and allowances purchasing from auctions and sales costs. The total costs also include expenditures for the grid, annualised, and other costs, such as for levies and charges. All cost items are endogenous in the model and are accounted for in full detail.

In the context of the present Impact Assessment, an ex-post calculation approach based on the 2021 modelling results was employed. The methodology involved utilising the different CBAM default values used in the 2021 modeling exercise together with the results of the projected KPIs, such as CO2 emissions, net electricity imports, power generation, and system costs. Subsequently, the analysis focused on examining the linear relationship between the KPIs and the default values for the years 2030 and 2035. New default values were established to reflect both the baseline and Options 3 and 4 based on the projected power mixes as well as the current source- and country-specific emission factors of exporting countries. After assessing the goodness of fit, a linear extrapolation was used to estimate values of the KPIs outside the range of the observed data based on the assumption that the relationship continues beyond the observed data.

This methodological continuity ensured that results are consistent, reliable, and empirically grounded by utilising validated modelling efforts and techniques, thus effectively addressing the lack of new modelling results.

# ANNEX 5: COMPETITIVENESS CHECK

### 5.1 Overview of impacts on competitiveness

| Dimensions of Competitiveness | Impact of the initiative (++ / + / 0 / - / -- / n.a.) | References to sub-sections of the main report or annexes |
|---|---|---|
| Cost and price competitiveness | 0/+ | Sections 6.2.3, 6.2.4 |
| International competitiveness | 0/+ | Sections 6.2.3 |
| Capacity to innovate | + | Sections 6.2.3, 6.4.1 |
| SME competitiveness | 0/- | Sections 6.3.2, 8.5 |

### 5.2 Synthetic assessment

The preferred policy option package – a balanced extension of CBAM to at-risk downstream goods with significant climate relevance, the introduction of targeted anti-avoidance measures including pre-consumer scrap as precursor and empowerment mechanisms, and an adjustment of the emissions factor for electricity and amended criteria to declare actual values – has marginally positive impacts on competitiveness overall. Among the three strands, the downstream extension would have the most significant competitiveness implications because it levels the playing field for domestically produced and imported steel- and aluminium-intensive downstream products with respect to the carbon costs they face. However, even for the downstream extension, the macro-level impacts on output, investment, consumer prices and employment are small and lie within narrow modelling ranges. The anti-circumvention and electricity strands primarily improve enforcement mechanisms and methodological accuracy, with limited direct competitiveness effects. Overall, the preferred policy option package slightly improves cost and price as well as international competitiveness for concerned domestic downstream producers by reducing carbon leakage pressures. At the same time, model projections indicate very minor changes in aggregate EU imports and exports of covered downstream goods relative to the baseline. Impacts on trading partners are more heterogeneous as exporters with lower-carbon steel and aluminium product mixes are projected to become slightly more competitive in the EU market, while those with more carbon-intensive mixes could see relative losses in market share. The package as a whole supports innovation by ensuring a uniform carbon price for both domestically produced CBAM goods and corresponding imports, thereby reinforcing predictable incentives for low-carbon production and cleaner electricity generation.

### 5.3 Competitive position of the most affected sectors

In terms of sectoral competitiveness impacts, the preferred policy option package mainly affects the *fabricated metal products* sector which is highly exposed to steel and aluminium input costs. The dual cost push described in Section 2 is likely to severely undermine the competitiveness of this particular sector if the embedded emissions of CBAM inputs in imported metal products remained unpriced. The proposed extension of CBAM to steel- and aluminium-intensive downstream products would significantly reduce the carbon leakage pressure faced by domestic producers in that sector, while leaving macro-level impacts on output, prices and employment small (see section 6.2.3 for quantitative estimates). Within the sector, effects are expected to be heterogenous as sub-sectors with high material content shares in their product lines and with strong import penetration would see the clearest levelling of the playing field. On the market side, clearer recognition of low-carbon inputs, and reinforced by the electricity strand, supports firms investing in green steel and aluminium sourcing, improving their medium-term competitiveness as buyer demand for low-emission products grows in light of a rising carbon price. Some administrative costs may arise for firms in the *fabricated metal products* sector relying on imported intermediate metal goods as inputs, but these are expected to be limited and significantly outweighed by the overall benefits for that sector.

# ANNEX 6: SME CHECK

## 6.1 Methodology to identify SMEs

The Commission estimated the number of SMEs brought into CBAM's scope by the downstream extension (see Section 6.2.6 of the Impact Assessment). These calculations involved: 1. a methodology to identify SMEs; and 2. a sample size correction to account for some missing importer identifiers in some of the underlying customs import data.

## 6.2 Methodology to identify SMEs: combining customs data and Orbis data

The profile of importers for downstream products was also analysed, based on data from the ORBIS data base and customs data through data reconciliation techniques.

In customs data, the importers are identified with their EORI numbers[23], except for private persons that only occasionally lodge a customs declaration and are therefore not required to have an EORI number. In contrast, companies are identified in ORBIS based on other identifiers. The Commission services undertook to reconcile the EORI numbers in customs data with the different identifiers available in ORBIS. Customs import declaration data for 2024 were used for this analysis.

The Commission services extracted from ORBIS several variables to define the type of companies: (i) number of employees, (ii) turnover, (iii) the size classification, which is a measure for the type of companies developed by ORBIS. In case of missing data in ORBIS for number of employees and turnover, the Commission services relied on the size classification variable provided by ORBIS that is a composite indicator of other variables.

Table 5 below provides the definition of small, medium, large, and very large, according to the size classification from ORBIS. When several size classifications were identified for a given importer, the biggest size classification was selected.

**Table 5: Size classification variable defined in ORBIS**

| Amounts in EUR | Very large | Large | Medium | Small |
|---|---|---|---|---|
| Operating revenue<br>Total assets<br>Employee number | >= 100 million<br>>= 200 million<br>>= 1,000 | >= 10 million<br>>= 20 million<br>>=150 | >= 1 million<br>>= 2 million<br>>=15 | Companies in Orbis are considered to be small when they are not included in another category. |

*Source: Orbis URLSize Classifications: Guide - Orbis User Guide. Note: for Very Large companies, being Listed is also a criteria.*

[23] EORI stands for "Economic operators registration and identification". An EORI number is mandatory for customs clearance in the customs territory of the European Union. EORI uniquely identifies economic operators and other persons. Source: https://taxation-customs.ec.europa.eu/customs/customs-procedures-import-and-export/customs-operations/economic-operators-registration-and-identification-number-eori_en#:~:text=EORI%20stands%20for%20%E2%80%9C%20Economic%20operators%20registration%20and,customs%20operations%20such%20as%20export%2C%20import%20and%20transit. .

### 6.3 Sample size correction

A sample size correction is necessary since some identifiers for importers are missing in customs data. This is for two reasons: (i) natural persons and occasional importers are not required to have an EORI identifier, and (ii) some Member States were not compliant with the Surveillance system for customs import declaration data in 2024.[24]

The correction factor is based is the proportion of net mass for import declarations in 2024 for which EORI numbers were available, that is 70% for import declarations of downstream products. In other words, the estimated number of importers for downstream products are extrapolated, taking into account that the observed number of importers represent 70% for downstream products.

### 6.4 Determination of the number of SMEs affected

For downstream products (see Section 6.2.6 of the Impact Assessment), the number of affected SMEs depends on two elements:

- The overall number of importers, and
- The proportion of SMEs amongst these importers.

For downstream products, there is no more than 20% of SMEs amongst the importers affected by the downstream scope extension.

## OVERVIEW OF IMPACTS ON SMES

**Relevance for SMEs**
*(Based on SME filter and the ISG discussion, this initiative is relevant/highly relevant for SMEs[25])*

**(1) IDENTIFICATION OF AFFECTED BUSINESSES AND ASSESSMENT OF RELEVANCE**
**Are SMEs directly affected?** *Yes* **In which sectors?**

- Inclusion of downstream sectors into the scope of CBAM.
  - Option 1. The following NACE sectors cover 82% of the SMEs affected: “C - Manufacturing” (19%), “F - Construction” (1%), “G - Wholesale and retail trade; repair of motor vehicles and motorcycles” (56%), “H - Transportation and storage” (1%), “M - Professional, scientific and technical activities” (2%), “N - Administrative and support service activities” (1%), Other (2%).
  - Option 2. The following NACE sectors cover 74% of the SMEs affected: “C - Manufacturing” (13%), “F - Construction” (1%), “G - Wholesale and retail trade; repair of motor vehicles and motorcycles” (53%), “H - Transportation and storage” (1%), “M - Professional, scientific and technical activities” (2%), “N - Administrative and support service activities” (2%), Other (2%).

[24] See list of data elements in Annex 21-03 of the Commission Implementing Regulation (EU) 2015/2447 (UDD IA).
[25] https://ec.europa.eu/docsroom/documents/63274

- Option 3. The following NACE sectors cover 74% of the SMEs affected: “C - Manufacturing” (13%), “F - Construction” (1%), “G - Wholesale and retail trade; repair of motor vehicles and motorcycles” (53%), “H - Transportation and storage” (1%), “M - Professional, scientific and technical activities” (2%), “N - Administrative and support service activities” (1%), Other (2%).

**Estimated number of directly affected SMEs**

Inclusion of downstream products in scope of CBAM: 700-800 SMEs in option 1, 3800-3900 SMEs in Option 2, 4700-4800 SMEs in Option 3.

**Estimated number of employees in directly affected SMEs**

Inclusion of downstream sectors into the scope of CBAM: Option 1 has an impact on about 6,677 employees; Option 2 on about 40,364 employees; and Option 3 on about 49,539 employees.

**Are SMEs indirectly affected?** *No*

**(2) CONSULTATION OF SME STAKEHOLDERS**

**How has the input from the SME community been taken into consideration?**

The public consultation received 41 responses from micro enterprises (1 to 9 employees), 38 responses from small enterprises (10 to 49 employees), and 31 responses from medium-sized enterprises (50 to 249 employees). In other words, 46% of the 240 submissions were from SMEs.

**Are SMEs’ views different from those of large businesses?** *(Yes/No)*

The main difference is that, counterintuitively, the proportion of SMEs (44%) who agree or strongly agree that downstream extension would increase costs for SMEs in the EU is *slightly lower* than large companies (48%) and business associations (53%). Likewise, a larger proportion of SMEs (40%; n=25) indicated a neutral opinion on this issue compared to large companies (24%; n=109) and business associations (29%; n=78).

| **(3) ASSESSMENT OF IMPACTS ON SMEs[26]** |
| --- |
| **What are the estimated direct costs for SMEs of the preferred policy option*?*** (Fill in only if step 1 *flags direct impacts)* |
| ***Qualitative assessment*** |
| Cost incurred by EU SME’s are mostly administrative costs. The total administrative cost for all companies is outlined in Section 6.2.5.1 above. About half of the importers in scope of the downstream extension are SMEs. The administrative cost of all companies the administrative costs faced by SMEs will likely be on the lower end of the cost range since SMEs are more typically smaller importers. |
| **Quantitative assessment** |

[26] The costs and benefits data in this annex are consistent with the data in annex 3. The preferred option includes the mitigating measures listed in section 4.

| |
|---|
| The implied costs are EUR 0.9–5 million for Option 1, EUR 4.2–22.6 million for Option 2, and EUR 4.95–28.8 million for Option 3.[27] |
| **What are the estimated direct benefits/cost savings for SMEs of the preferred policy option[28]?** |
| **Qualitative assessment** |
| Option 2 for downstream scope extension: SMEs in the EU will benefit from a better production against the risk of carbon leakage. Furthermore, the measures against CBAM avoidance will ensure that the CBAM adjustment reflects appropriately the carbon content of the goods imported. Extension to downstream product allows to ensure the risk of carbon leakage for CBAM basic goods is not pushed further down the value chain. |
| **Quantitative assessment** |
| *(Provide numbers)*<br>N/A |
| **What are the indirect impacts of this initiative on SMEs?** *(Fill in only if step 1 flags indirect impacts)* |
| N/A |

### (4) MINIMISING NEGATIVE IMPACTS ON SMES

**Are SMEs disproportionately affected compared to large companies?** *No*

**If yes, are there any specific subgroups of SMEs more exposed than others?**

*(Explain)*

**Have mitigating measures been included in the preferred option/proposal?** No

*(Specify the mitigating measures, including SME-friendly provisions (e.g. phasing ins, guidance, etc.). Describe the expected benefits/cost savings qualitatively and, where possible, quantitatively)*

*Downstream scope extension: Option 2 and Option 3 are preferred in terms of environmental benefits, and Option 2, which is the preferred option, has a lower number of SMEs affected '3800-3900 SMEs in Option 2 compared to 4700-4800 SMEs in Option3.*

### CONTRIBUTION TO THE 35% BURDEN REDUCTION TARGET FOR SMES

[27] This is based on the share of SMEs in the total number of importers covered by a downstream extension (see Section 6.2.6) multiplied by the total additional compliance cost for companies as reported in section 6.2.5.1.

[28] The direct benefits for SMEs can also be cost savings.

**Are there any administrative cost savings relevant for the 35% burden reduction target for SMEs?**
*(Provide number from Annex 3)*
*N/A*

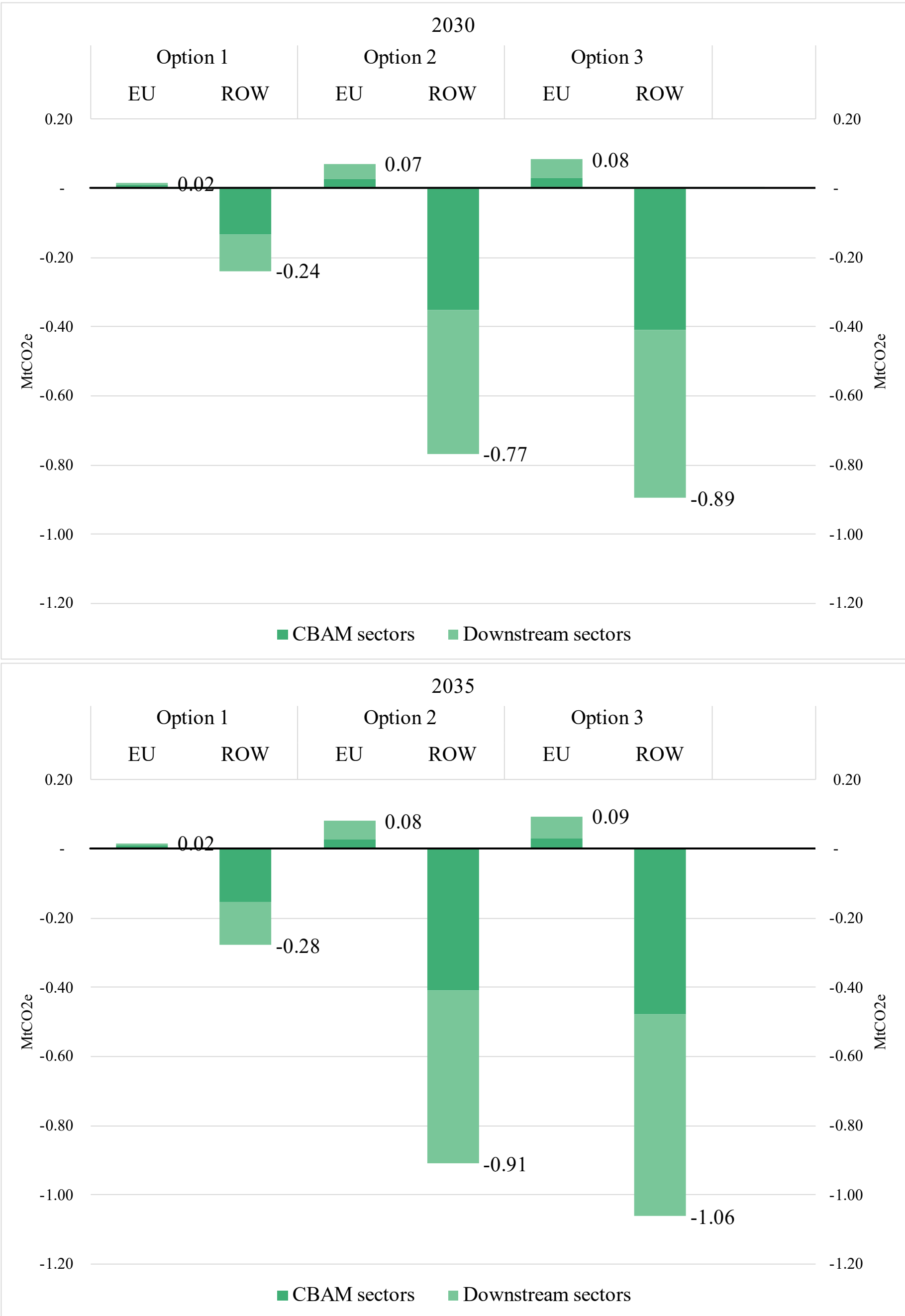
## ADDITIONAL INFORMATION

None applicable

# ANNEX 7: ADDITIONAL INFORMATION ON DOWNSTREAM

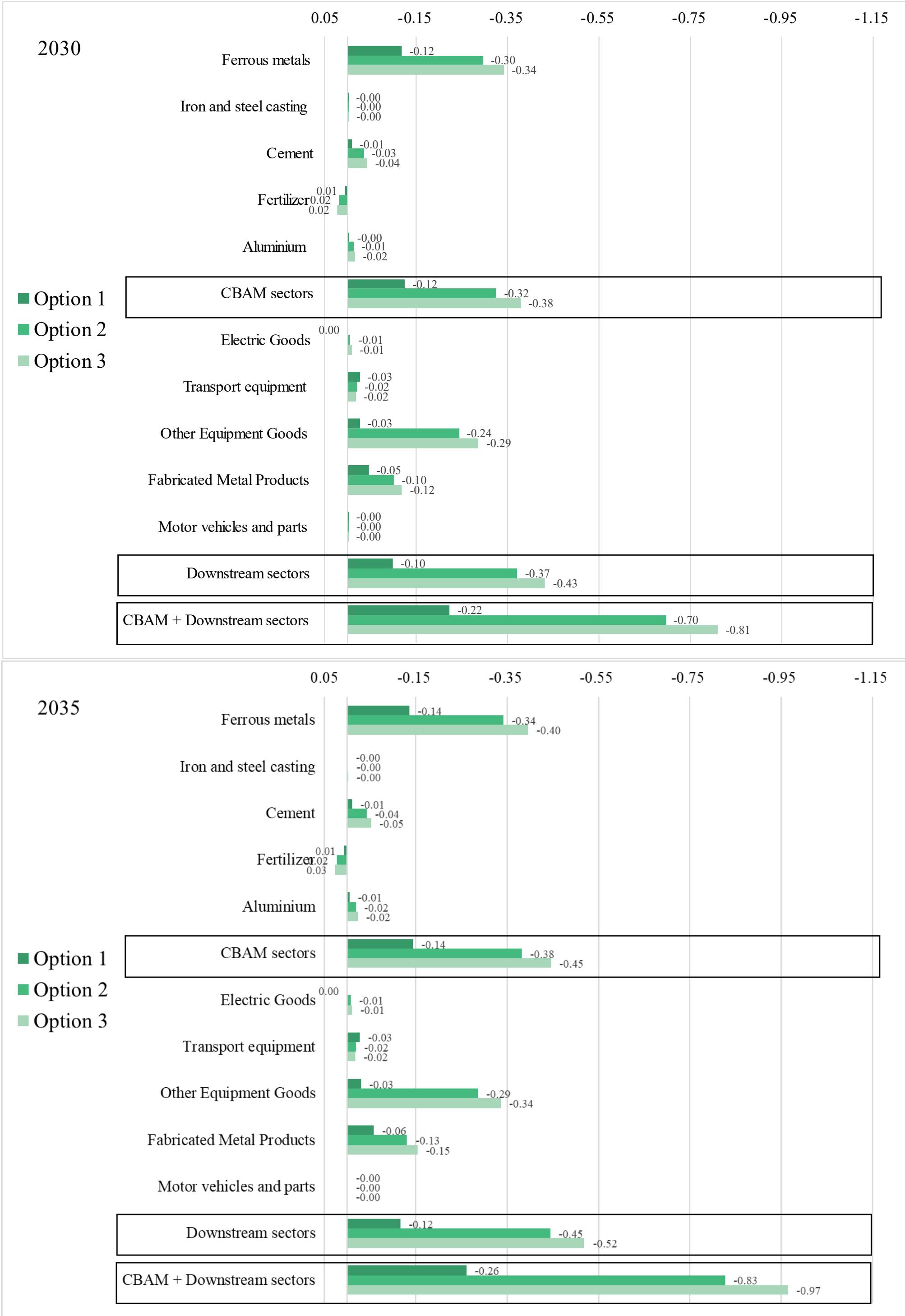
## 7.1 Estimated emission changes

**Figure 24: Estimated emission changes due to CBAM downstream extension, 2030-2035, EU vs Rest of the World**




*Note: Mt of CO2e changes in GHG emissions worldwide, 2030 and 2035. The changes are relative to the baseline (CBAM without downstream extension). Broken down by contributions of the CBAM sectors and the downstream sectors, the three main option scenarios, as well as world regions. Source: JRC's simulations with the JRC-GEM-E3 model.*

**Figure 25: Estimated emission changes due to CBAM downstream extension, 2030 and 2035, worldwide**




*Note: Mt of CO2e changes in GHG emissions worldwide. The changes are relative to the baseline (CBAM without downstream extension). Source: JRC-GEM-E3 model.*

### 7.2 Trade impact

Adding to the analysis in section 6.2 of the main text, the below graphs and tables provide additional insight into the trade impacts of a downstream extension.

First, a breakdown of the impact of a downstream extension on imports per sector is shown in Table 6.

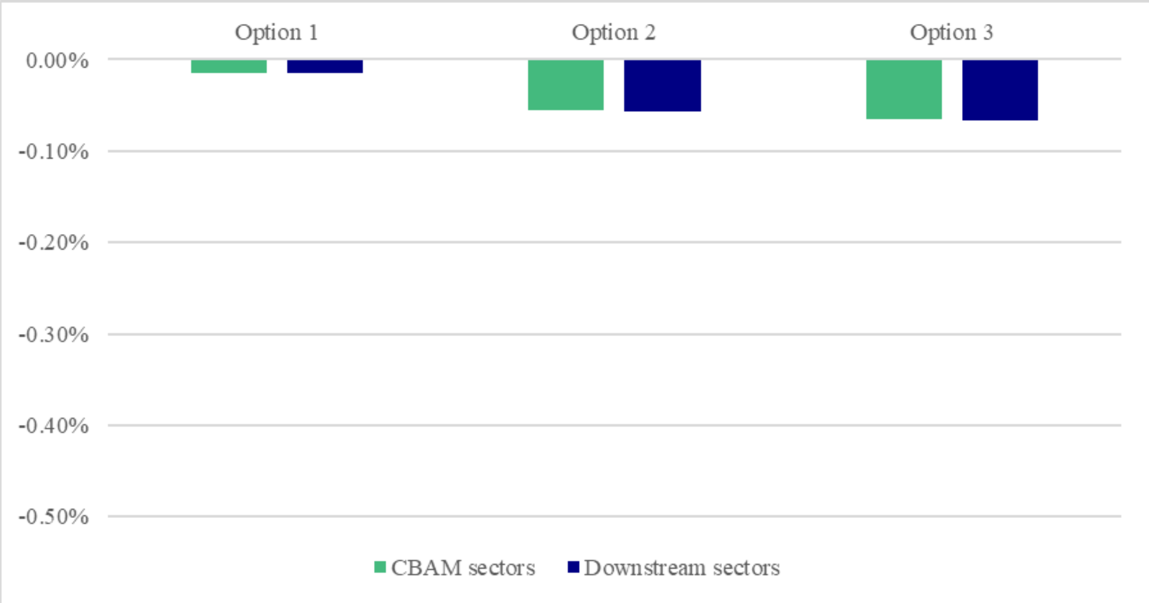
**Table 6: EU imports (% change compared to baseline)**

| | **2030** | | | **2035** | | |
|---|---|---|---|---|---|---|
| *Options* | 1 | 2 | 3 | 1 | 2 | 3 |
| Ferrous metals | 0.02% | 0.07% | 0.09% | 0.03% | 0.10% | 0.11% |
| Iron and steel casting | 0.03% | 0.09% | 0.11% | 0.04% | 0.11% | 0.13% |
| Cement | 0.00% | 0.01% | 0.01% | 0.00% | 0.02% | 0.02% |
| Fertilizer | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Aluminium | 0.02% | 0.07% | 0.08% | 0.02% | 0.09% | 0.10% |
| CBAM sectors | 0.02% | 0.07% | 0.08% | 0.03% | 0.09% | 0.10% |
| Electric Goods | 0.00% | -0.08% | -0.11% | 0.00% | -0.10% | -0.14% |
| Transport equipment | -0.13% | -0.12% | -0.11% | -0.15% | -0.13% | -0.13% |
| Other Equipment Goods | -0.04% | -0.34% | -0.40% | -0.05% | -0.40% | -0.47% |
| Fabricated Metal Products | -0.41% | -0.91% | -1.08% | -0.53% | -1.17% | -1.39% |
| Motor vehicles and parts | -0.11% | -0.23% | -0.23% | -0.13% | -0.30% | -0.29% |
| Downstream sectors | -0.06% | -0.23% | -0.27% | -0.08% | -0.28% | -0.33% |
| CBAM + Downstream sectors | -0.06% | -0.21% | -0.25% | -0.07% | -0.26% | -0.31% |

Source: JRC-GEM-E3 model

On the export side, all three options show a very minor decrease compared to the baseline as depicted belowFigure 26. The difference in the impact between the different CBAM and downstream sector aggregations is quite small, though the *fabricated metal products* sector stands out (not shown) as the only sector with a minor increase in exports compared to the baseline.

**Figure 26: Change in EU exports for CBAM and downstream sectors in 2035 compared to baseline**

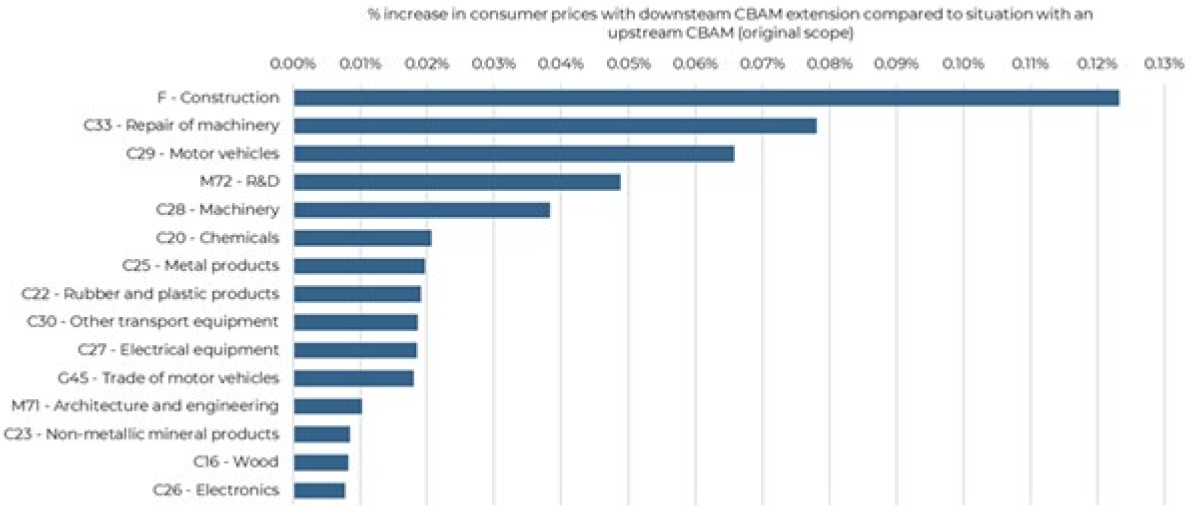



Source: JRC-GEM-E3 model

### 7.3 Impacts on consumer prices

In addition to the analysis referred to in Section 6.2.4.1 of the Impact Assessment, a further breakdown of the results at NACE 2-digit level is shown in Figure 27 below.[1] Beyond construction, the sectors with the highest price increases are Repairing machinery (C33), Motor vehicles (C29), R&D (M72), and Machinery (C28). EU consumers could see 0.08% increase in the price of repairing machinery in the target year 2030, as the downstream CBAM extension would directly and indirectly increase the price of imported replacement parts. Likewise, a downstream CBAM extension, which includes motor parts, would indirectly increase the cost of automobiles and its parts for EU consumers by about 0.07%. Similarly for machinery by about 0.05%. For R&D, final consumption is mainly by the government, where a downstream CBAM extension could (directly and indirectly) increase the cost of technical materials as well as vehicles used for R&D services. These additional costs for R&D could be passed on, increasing the price of R&D by 0.04%.

**Figure 27: Top fifteen sectors with the highest estimated price increase for EU final consumers with a downstream CBAM extension compared to the reference situation in the target year 2030 (%)**



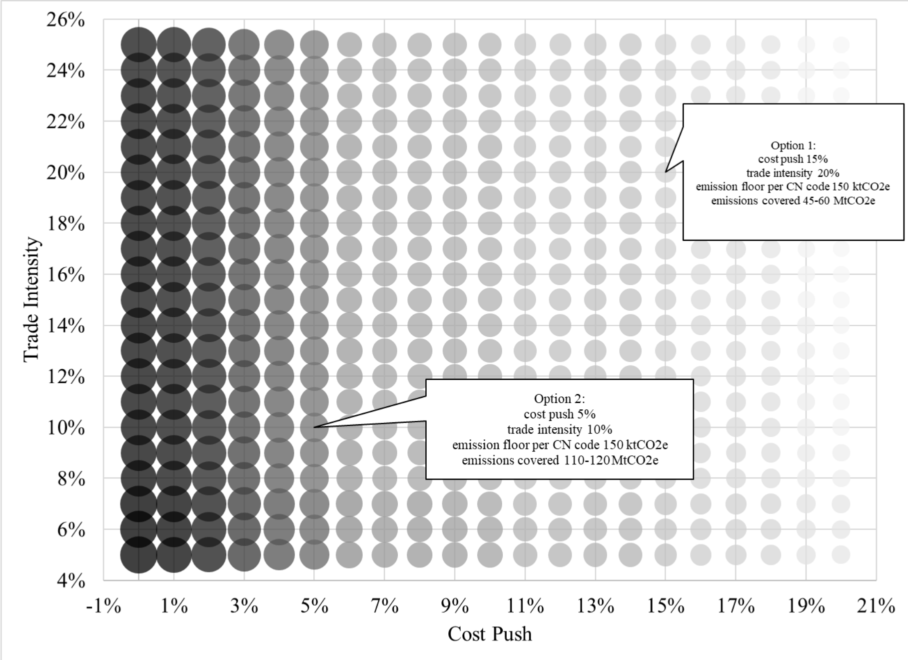

*Source: Downstream support study.*

### 7.4 Sensitivity analysis of options to filters

Further sensitivity analysis has been carried out with respect to the various filters (see Section 7 of the Impact Assessment). In particular, a series of scenarios are considered around the three options. The **first set of sensitivity calculations** considered filter combinations when the **emission floor is set at 150Kt CO2e**. The trade intensity filter was then changed between 5% and 25% on a grid by steps of 1%. Similarly, the cost push filter was changed on a grid from 0% to 20%. Within these grids, all combinations of trade intensity and cost push were calculated. Figure 28 and Figure 29 below, display for each of these combinations the total embedded emissions in EU production and the production emissions per CN product, respectively. In these graphs, each circle represents a given filter combination. Both the size and colour shade of the circles show the level of emissions: The more emissions the larger and darker is the circle. The two figures include both Option 1 and Option 2, as these options both have the emission floor parameter set at 150Kt CO2e. Option 3 is not covered in this first set of sensitivity calculations as its emission floor parameter is set at 0Kt CO2e.The figures show that the results tend to be robust with respect to the *trade intensity* threshold parameter. That is, changing the threshold parameter around the respective values of Option 1 and 2 do not substantially impact the implied total emissions and emissions per CN code. It is clear that Option 2 captures an almost twice as large mass of CO2 emissions than Option 1 (110-120 vs 45-60 Mt CO2e per year). In terms of emission per CN code, the two options are more similar.

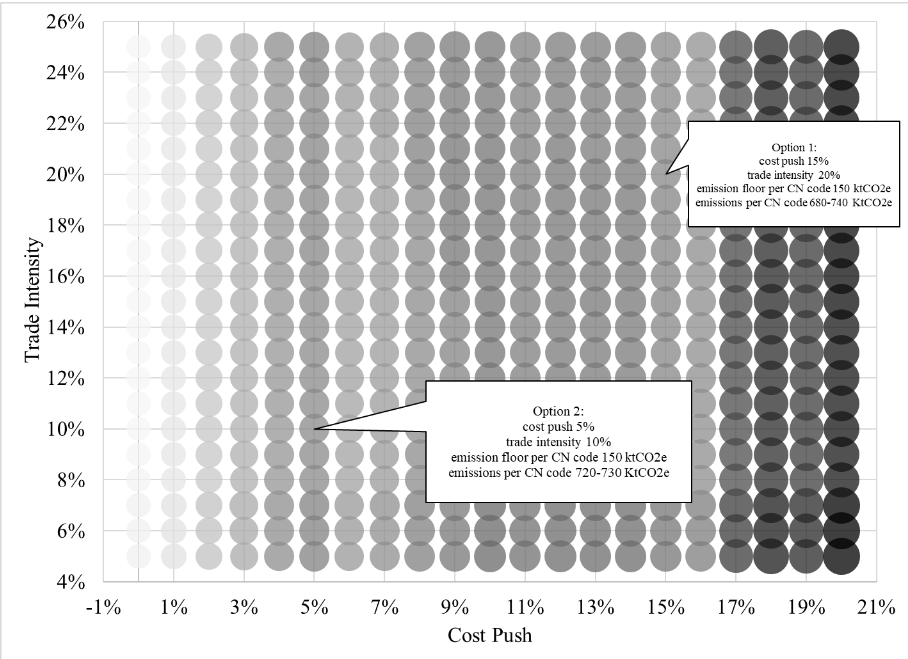
As for the *cost push* parameter, the results are somewhat more sensitive. By lowering the threshold a larger mass of emissions are tend to be captured, especially around the Option 2 scenario. However, this increase in emissions covered comes at the price of lower emissions per CN code brought into CBAM scope.

**Figure 28: Sensitivity analysis: Total production emissions as trade intensity and cost push change, Option 1 vs Option 2**




*Source. Commission calculations. Emission floor per CN code is fixed at 150Kt CO2e.*

**Figure 29: Sensitivity analysis: Emissions per CN code as trade intensity and cost push change, Option 1 vs Option 2**



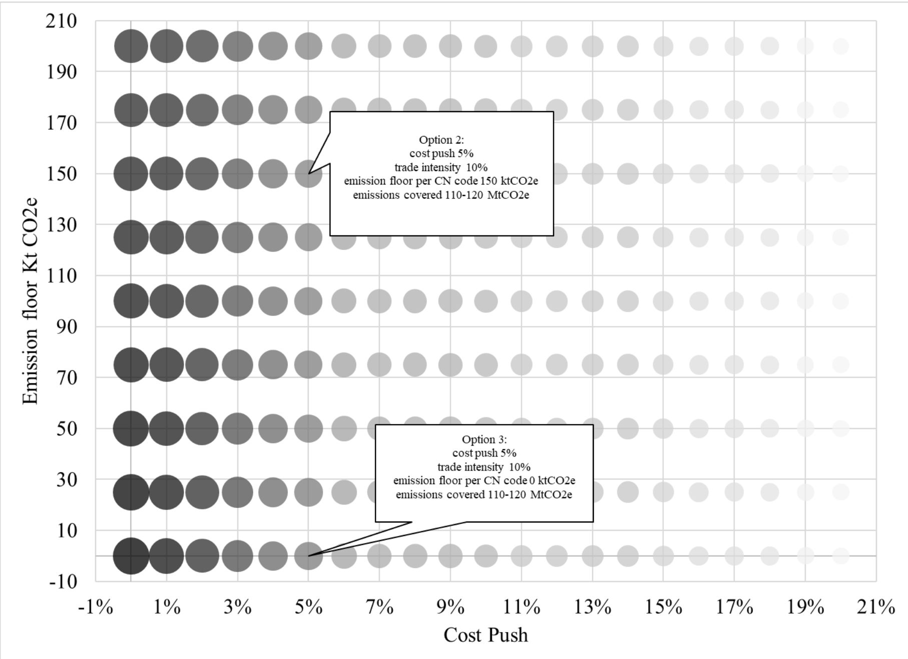

*Source. Commission calculations. Emission floor per CN code is fixed at 150Kt CO2e per yer.*

The **second set of sensitivity calculations** considered filter combinations when the **trade intensity filter is kept at 10%**. Again, a grid of combinations is calculated when the emission floor parameter runs from 0 to 200Kt CO2e, and cost push from 0% to 20%. Figure 30 and Figure 31 below, display for each of these combinations the total embedded emissions in EU production and the production emissions per CN product, respectively. As before, each circle represents a given filter combination. Both the size and colour shade of the circles show the level of emissions: The more emissions the larger and darker is the circle. The two figures include both Option 2 and Option 3, as these options both have the trade intensity parameter set at 10%. Option 1 is not covered in this second set of sensitivity calculations as its trade intensity parameter is set at 20%.

The figures show that the results tend to be robust with respect to the *emission floor* threshold parameter. That is, changing the threshold parameter around the respective values of Option 2 and 3 do not substantially impact the implied total emissions and emissions per CN code. Both Option 2 and Option 3 captures a similarly large mass of CO2 emissions (110-120Mt CO2e). However, in terms of emission per CN code Option 2 has a significantly larger value than Option 3 (720-730 and 470-480Kt CO2e, respectively).

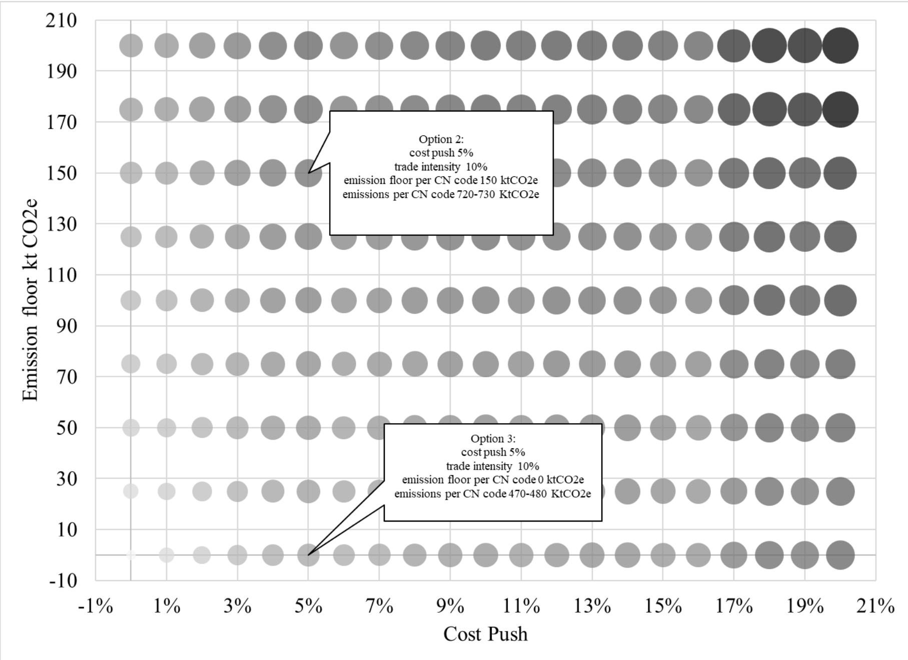
As for the *cost push* parameter, the results are somewhat more sensitive. By lowering the threshold a larger mass of emissions are tend to be captured for both Option 2 and Option 3 However, this increase in emissions covered comes at the price of significantly lower emissions per CN code brought into CBAM's scope.

**Figure 30: Sensitivity analysis: Emissions per CN code as emission floor and cost push change, Option 2 vs Option 3**




*Source. Commission calculations. Trade intensity is fixed at 10%.*

**Figure 31: Sensitivity analysis: Emissions per CN code as emission floor and cost push change, Option 2 vs Option 3**




*Source. Commission calculations. Trade intensity is fixed at 10%.*

# ANNEX 8: COMPLIANCE COST COMPANIES AND AUTHORITIES

## 8.1 Compliance cost companies baseline

The compliance cost for businesses involves different elements. It includes costs that scale with the number of CBAM declarations, such as the preparation of documents, estimating the embedded emission of imported goods, tracking the origin of goods and submitting information to the CBAM registry. Businesses may also incur fixed, annual costs. These include the purchase and surrender of CBAM certificates, audit costs and costs related to IT, the training of staff and capacity building of product suppliers (to obtain accurate data necessary for CBAM compliance).

Respondents to the survey indicated how many working days are expected to be needed to complete each element required to comply with CBAM obligations. Based on these responses, and an assumption on wage costs, estimations were made for the compliance cost per importer in the baseline scenario. A minimal, low and high range estimate is reported in Table 7. The minimal cost estimate represents a company with relatively low import volumes, submitting only a few CBAM declaration per year. The low and high range cost estimates represent the $25^{th}$ and $75^{th}$ percentile of survey responses respectively. The high range estimate mostly concerns companies with large import volumes that likely intend to estimate the actual emission values (in contrast to using default emission values) associated with imported goods.

**Table 7: Total compliance cost (EUR) per business with minimal/low/high import volume (baseline)**

| | Minimal | Low | High |
|---|---|---|---|
| Annual costs related to activities | 900 | 5,400 | 19,900 |
| Other annual costs (IT maintenance, legal fees, training) | | 0 | 61,900 |
| Total annual cost per importer | 900 | 5,400 | 81,900 |

Source: Downstream study.

To arrive at the total compliance cost for companies in the baseline, the cost per importer is multiplied by the number of importers in scope of the current CBAM. Given the wide range of survey responses, a low- and high-end estimate is calculated using different assumptions on the distribution of importers among the different cost point estimates. Importers are attributed to cost point estimates according to their import volume in tonnes. For example, as shown in Table 8, importers with limited import volume just above the 50t threshold are assumed to have a compliance cost of EUR 900. The cut-off points for these different ranges is determined by comparing the cost of embedded emissions for a given importer with the estimated compliance cost of that importer. It is then assumed that importers will not fall in cost categories for which the compliance cost exceeds the cost of embedded emissions. For example, importers importing less than 104t are estimated to face a cost of embedded emissions below EUR 5,400 and therefore are attributed to the lowest cost point estimate.

**Table 8: Import volume threshold for distribution of importers among different cost point estimates**

| Cost point estimate (EUR) | Import volume thresholds for low estimate (tonnes) | Import volume thresholds for high estimate (tonnes) |
|---|---|---|
| 900 | 50t – 104t | 50t – 104t |
| 5,400 | >104t | 104t – 385t |
| 19,900 | - | 385t – 1584t |
| 81,900 | - | >1584t |

As reported in section 6.2.5, with these assumptions, the total annual baseline compliance cost for companies is estimated to be between EUR 76 million and 371 million.

Besides the (annually) recurring costs discussed so far, a small share of survey respondents reported to expect initial adjustment costs such as legal and consulting fees and the setting up of new IT infrastructure. On the low end, no such one-off adjustment costs were reported. On the high-end (75th percentile of survey respondents), adjustment costs of up to EUR 129,000 were reported. Assuming the same distribution of importers used for calculating the recurring costs, the total one-off adjustment costs would amount to EUR 388 million in the baseline.

## 8.2 Additional compliance cost companies after downstream extension

A downstream extension of CBAM impacts the administrative burden in two ways. First, there is a scale effect as a downstream extension increases the number of importers facing CBAM obligations and the number of products for which CBAM declarations need to be made. Second, the complexity and thus costs associated with the reporting obligations for downstream products is higher than that of basic material goods insofar as actual emissions are used, resulting in a higher cost per importer for downstream goods. Downstream products may make use of multiple CBAM basic material goods as inputs, potentially from different places of origin and/or different methods of production. This can make many of the steps required to comply with CBAM obligations (in particular, the monitoring of actual emissions) more involved.

To capture the scale effect, the additional import volume (in tonnes) arising from each of the three options for downstream extension is compared with the import volume of the current CBAM scope. The additional import volume under a downstream extension serves as a proxy for both the increase in the number of importers and the increase in the total number of import activities that require CBAM declarations. The added complexity to fulfil CBAM obligations for downstream goods is assessed through the use of survey data. In addition to reporting the time required to comply with the current CBAM obligations, survey respondents also indicated their expectation for the time required to comply with CBAM obligations for downstream goods. Based on these survey responses, the average cost per importer is estimated to be 24% - 43% higher for downstream goods compared to basic material goods. As discussed in section 6.2.5, the scale factor and complexity factor (1.24 – 1.43) are multiplied with the estimated compliance cost for companies in the baseline to obtain an estimate for the additional total compliance cost for each of the options.

### 8.3 Enforcement cost authorities baseline

The enforcement cost of authorities in the baseline is estimated based on interviews with national competent authorities (NCA) and customs authorities. The interview sample includes both countries where customs authorities are also the competent authorities, and countries where national competent authorities and customs authorities are two different entities. Countries with high import volumes of CBAM related goods were prioritised while consideration was also given to ensure that countries selected included those without external borders, those with land borders with non-EU countries and those with sea borders. Estimates on the time required for fulfilling all activities related to CBAM were used in combination with an assumption on the hourly wage cost to arrive at a cost estimate per NCA.

For the determination of a cost range for the enforcement of NCAs, the estimates from the interviewees with the lowest and highest total cost are used. The breakdown of these costs is shown in Table 9 below.

**Table 9: Cost breakdown in EUR thousands (annual, per NCA)**

| | Low-end | High-end |
|---|---|---|
| Staff training | 146 | 0 |
| Authorisation of CBAM registration | 98 | 347 |
| Review of declarations | 244 | 347 |
| Monitoring activity in case of non compliance of the CBAM certificates | 98 | 694 |
| Investigation and penalties | 146 | 463 |
| Sale and management of CBAM certificates | 0 | 0 |
| Other costs (coordination with customs authorities, European Commission) | 244 | 463 |
| IT system maintenance | 80 | 20 |
| Total annual costs | 1,056 | 2,334 |

Source: Downstream study.

The cost breakdown for customs authorities is shown in Table 10.

**Table 10: Cost breakdown in EUR thousands (annual, per customs authority)**

| | Low-end | High-end |
|---|---|---|
| Staff training | 1 | 10 |
| Check on goods at borders, risked-based inspections and non-compliance enforcement activities | 14 | 1800 |
| CBAM import data transmission and communication | 5 | 8 |

| | | |
|---|---|---|
| Investigation | 1 | 920 |
| Other costs (coordination with NCAs, European Commission and importers) | 1 | 248 |
| Total costs per year | 22 | 2,986 |

# ANNEX 9: ADDITIONAL INFORMATION ON CBAM AVOIDANCE

## 9.1 Analysis of actual emission in the CBAM transitional registry

As explained in Section 2.2.2.2 of the Impact Assessment, the methodology to calculate embedded emissions, CBAM declarations, and import declarations, rely on CN codes. However, the embedded emissions of goods can vary widely within a given CN code, depending on the quality required for the goods, which is linked to its composition. As discussed below, the wide variation in actual emissions can be evidenced from declarations in CBAM Transitional registry.

In the cement sector, the emission intensity depends essentially on the clinker content of the goods. For fertilisers, the emission intensity depends on the nitrogen content. For stainless steel and other alloy steel, in addition to the production route (BF-BOF or EAF), the emission intensity also depends on the content of alloying elements (i.e., mostly chromium, manganese and nickel). The composition of the goods, which affects directly its quality and functionality, also affects the embedded emissions.

The data confirms the concern put forward by the cement industry, about the heterogeneity of emissions within a given CN code.[29] For cement, for the CN code 2523 90 00 (which is the CN code with the highest number of CBAM declaration in the cement sector), there is also a high variation of actual emissions, from 0.16 tCO2/t to 1.27 tCO2/t. For reference, the default value for the Transitional period is set at 1.35tCO2/t for this specific CN code. This wide variation of emission intensity for a given CN code can also be evidenced by looking at emissions within a given installation: for example, the main installation where data on actual emissions is available has a material variation from 0.37 tCO2/t to 1.05 tCO2/t, that is by a factor of three.

A similar consideration applies to the iron and steel sector, where the composition in term of alloying content affects the embedded emissions, and to the fertiliser sector where the nitrogen content affects the embedded emissions.

## 9.2 Remaining regulatory and oversight vulnerabilities: lack of traceability

As explained in Section 2.2.2.3 of the Impact Assessment, the difficulty to trace the supply chain of imported goods, which is a general issue for imports going beyond CBAM,

[29] CBAM declarations with actual emissions are selected by considering all declarations where the determination type for emissions is equal to actual values. CBAM declarations with negative actual emissions for either direct or indirect emissions are excluded. CBAM declarations with outliers for actual emissions are removed. The data were extracted from the CBAM Transitional registry on 07 July 2025, and cover the period 2024Q4-2025Q1.

combined with the use of actual emissions in CBAM, can lead to a circumvention scheme where CBAM declarants would mis-declare emission intensity to decrease the CBAM financial adjustment, while importing relatively high-emission products. In particular, within the current framework, it is not possible to ascertain that the declarant has correctly assigned the imported volumes declared in the CBAM registry to the correct installation that produced the good.

In the example below, while the CBAM declarant declares 100 tonnes imported in the CBAM Registry, the CBAM declarant has misallocated the volume per installation in order to decrease the CBAM financial adjustment (by under-declaring volume for the high-emission installation and over-declaring volumes from the low emission installation). This type of misdeclaration of actual emissions by the CBAM declarant (due to a mis-allocation of volumes imported across installations in the CBAM registry) cannot be detected by other sources of information, neither by the verification report (which only lists the verified emissions at installation level) nor by the monitoring of customs declarations (since the installation from which the product was actually imported is not reported in the customs declaration).

| **Volume produced in a given third-country and sold to an EU importer** | **Volumes declared in the CBAM Registry** |
| --- | --- |
| Installation A: 90 tonnes<br>(actual emissions: 4 $tCO_2/t$ = high-emission installation) | Installation A: 10 tonnes<br>(under-declaration of volumes) |
| Installation B : 10 tonnes<br>(actual emissions: 1t $CO_2/t$ = low emission installation) | Installation B: 90 tonnes<br>(over-declaration of volumes) |

### 9.3 Discussion on the existing CBAM enforcement framework

The existing CBAM enforcement framework already allows to address many forms of non-compliance and circumvention, thereby addressing a number of risks outside the scope of this initiative. The CBAM Regulation provides:

- In Article 15 that the Commission shall carry out risk-based controls on the data and the transactions recorded in the CBAM registry to ensure that there are no irregularities in the purchase, holding, surrender, repurchase and cancellation of CBAM certificates.
- In Article 19 that the Commission shall have the oversight role in the review of CBAM declarations. The Commission can also review CBAM declarations.
- In Article 27 that the Commission shall act, based on relevant and objective data, to address practices of circumvention of this Regulation.

Moreover, the recently agreed revision of CBAM (under the 'Omnibus I' legislative package), further strengthens the anti-circumvention framework in relation to the monitoring and enforcement of the new de-minimis threshold (Article 25a). The CBAM Regulation also provides for several safeguards to better monitor the financial liability associated with the import of CBAM goods, such as a status of authorised CBAM Declarant, an independent verifier report to certify the emission intensity, the requirement to maintain a credit balance of at least 50% of the CBAM financial liability.

On the basis of the above, several risks listed in Figure 2 of the impact assessment can already be addressed within the current enforcement framework:

- Risk of misclassification of goods: This refers to the mis-declaration of the CN codes at import, for example by declaring a non-CBAM CN code instead of a CBAM CN code. This risk can be tackled with the current enforcement framework and based on existing data requirements.
- Risk of misdeclaration of quantities: This refers to CBAM declarants not reporting the correct quantity in the CBAM registry. This risk can also be addressed by the current enforcement framework and based on existing data requirements. Moreover, actual quantities can be verified by customs authorities where goods are physically presented, along with transaction documentation such as invoices, packing lists, and transport documents.
- Risk of mis-reporting on the de minimis threshold: The anti-circumvention framework was strengthened notably through Article 25a (as discussed above) and Article 27(2b), which was amended to consider artificial splitting of imports to remain below the de minimis threshold as an explicit form of circumvention.
- Missing CBAM declarants: This refers to the risks of the absence of CBAM declaration for importers of CBAM goods. This risk can also be addressed with the current enforcement framework and based on existing data requirements.

Nevertheless, while the current CBAM enforcement framework allows to address many forms of non-compliance and circumvention, the lessons learnt from the transitional period as well as stakeholder inputs (industry associations, individual companies but also NCAs and Customs Authorities) led to the identification of two specific risks for which additional/strengthened circumvention provisions in the CBAM regulation are deemed necessary: the risk of mis-declaration of emission intensity and the risk of abusive practice. This is why the initiative proposes to amend the regulatory framework specifically to address those risks, in addition to the downstream scope extension which addresses another channel of avoidance.

### 9.4 Lessons learnt from the transitional period

First, the transitional period has allowed to gather feedback from all relevant stakeholders (national authorities, importers, declarants, third-country operators, European producers), which could identify shortcomings and technical challenges related to the practical implementation of CBAM for its application to the embedded emissions of imported goods. This includes interlinkages between goods and their value chains, the clear delineation between simple and complex goods and the challenges that these pose for the attribution of emissions to more processed goods further down the value chain.

Second, the experience gathered during the transitional period, has allowed to identify a clear weakness in the design of the mechanism related to the compliance of occasional importers of small quantities of CBAM goods. This has brought forward analytical insights about the profile of CBAM importers and has triggered an unprecedented simplification of the rules.

Third, the CBAM Transitional Registry has provided us with a rich amount of information, for example with regard to emissions declared for same goods of different origin. Typically, the issue of the wide variation of emission within one CN code was raised by stakeholders and confirmed by the analysis of the Transitional Registry Data. Moreover, the comparison of data between the CBAM Transitional Registry and customs import data allows to identify missing CBAM declarants, and the experience gained during this Transitional period will also help us to develop the monitoring system for the 50 tonnes mass-threshold.

Finally, the transitional period also means that the Commission services have had to develop the various IT tools that are used for the implementation of CBAM, such as the Registry for the definitive period. It has allowed to identify blind spots and weaknesses, for example in terms of traceability.

Other lessons learnt from the CBAM transitional period include improvements related to data format and data accuracy that are being addressed at technical level, and do not call for a change to the Regulation. Such considerations, although of operational nature, will nonetheless be of crucial importance at the time of the anti-avoidance analysis and monitoring.

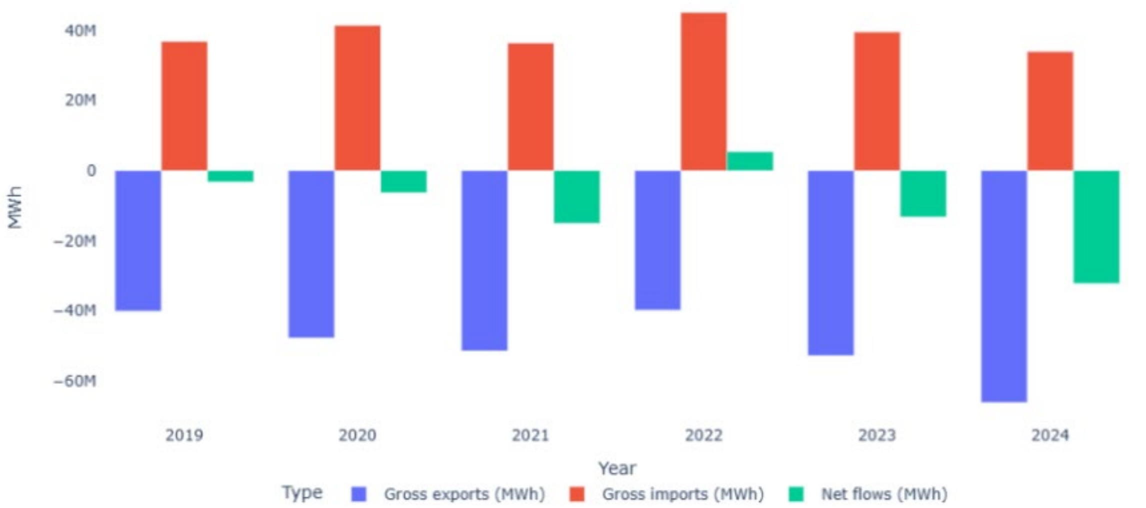
# ANNEX 10: ADDITIONAL INFORMATION ON ELECTRICITY

## 10.1 State of play of cross-border electricity trading

As electricity generated in third countries can only be delivered into the EU through interconnectors which may be subject to capacity constraints, the trade volumes are subject to the limitations of physical infrastructure. In total, gross commercial imports from non-ETS third countries to the EU amounted to 37 TWh in 2019. Gross commercial imports were mostly rising up to 2022 (at 45 TWh due to the energy crisis and other domestic factors in Europe), but since then have been decreasing to 34 TWh in 2024. Overall, electricity imports from non-EU ETS countries are very small and only constituted around 1.3% of EU electricity consumption in 2024, which means that exposure to international trade is lower than in other EU ETS sectors.

The interconnection infrastructure between the EU and third countries is, however, expected to increase over time[30]. Gross exports from the EU to these third countries have increased from 40 TWh in 2019, to 66 TWh in 2024, with the exception of 2022 (40 TWh). Overall, net electricity flows favoured the EU, indicating that the EU exported more electricity than it imported from these third countries. This trend showed an increase from 2019 to 2024, except in 2022, when the energy crisis temporarily reversed the dominant flow direction.

**Figure 32: Evolution of gross imports, exports and net flows by Non-EU ETS third countries into the EU, 2019-2024**




*Source: European Commission based on ENTSO-E Transparency platform*

In 2024, of the 34 TWh of gross commercial electricity imports from countries not participating in the EU ETS, 39% came from Great Britain, 56% from the Western Balkans, Ukraine, and Moldova, and 5% from Türkiye and Morocco. The volume of imports to the EU has experienced some variation since 2019, the time when the CBAM

[30] ENTSO-E, Ten-Year Network Development Plan, https://tyndp2024.entsoe.eu/projects-map/transmission

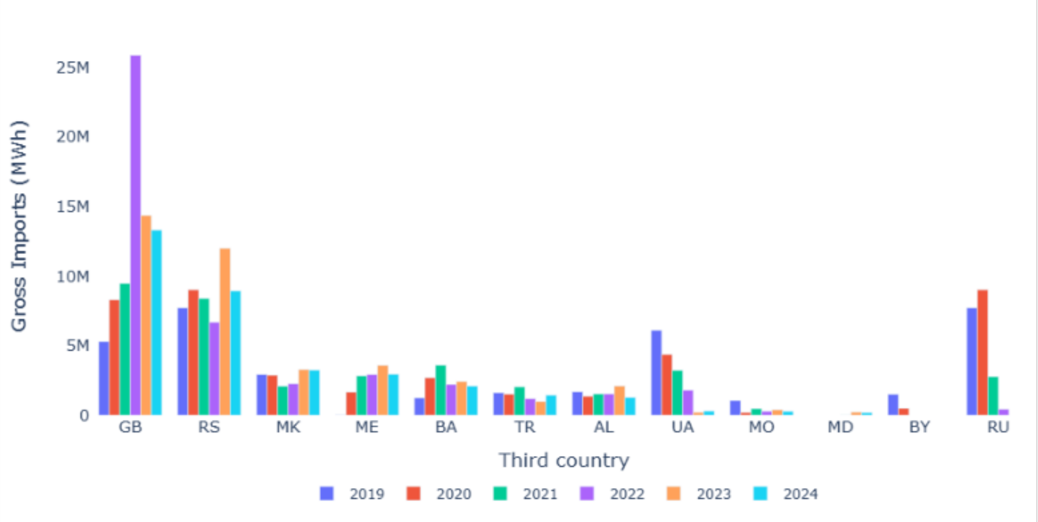
policy was initially envisioned. Figure 5 below shows the evolution of gross imports from third countries from 2019 to 2024[31].

Gross imports from Russia and Belarus completely halted as the Baltics and Finland cut electricity trade with both countries. Given the significant impact of the ongoing conflict on Ukraine's energy infrastructure, carbon-intensive electricity in Ukraine's mix has decreased significantly, limiting the prospect of its exports to the EU. Many of the country's fossil-based power plants have sustained considerable damage or have been completely destroyed. In response, Ukraine is likely to focus on rebuilding its energy sector with cleaner, more sustainable technologies. This strategic pivot towards renewables and low-carbon energy solutions aligns with global trends and EU climate goals.

While the gross imports from the UK to the EU have been increasing over recent years, the UK ETS already constitutes a carbon price for UK-based fossil-fired generation. In recent years, the UK ETS price was lower than the EU ETS though, therefore the difference of both ETS amounts to around 20 EUR/tCO2.

Gross imports from Serbia, North Macedonia, Montenegro, Bosnia and Herzegovina and Montenegro remained relatively stable over recent years.

**Figure 33: Evolution of gross imports from non-EU ETS third countries into the EU, 2019-2024**




*Source: European Commission based on ENTSO-E Transparency platform*

[31] Non-EU ETS third countries are considered to be: Great Britain, Serbia, North Macedonia, Montenegro, Bosnia and Herzegovina, Türkiye, Ukraine, Moldova, Morocco, Belarus and Russia. Imports of Great Britain are included in 2019 and 2020 flows to provide a measure of how imports have evolved from this country.

**Figure 34: Net electricity imports from non-EU ETS third countries into the EU, 2024**

| | Net electricity imports to the EU, 2024 (in MWh) | Share in EU electricity generation | EU MS importers |
|---|---|---|---|
| **Great Britain** | -26,120 | 1.0% | BE, DK, FR, IE, NL |
| **Serbia** | -582 | 0.0% | BG, HR, HU, RO |
| **North Macedonia** | -165 | 0.0% | BG, EL |
| **Montenegro** | 2,258 | 0.1% | IT |
| **Bosnia and Herzegovina** | -1,856 | 0.1% | HR |
| **Türkiye** | 873 | 0.0% | BG, EL |
| **Albania** | 222 | 0.0% | EL |
| **Ukraine** | -3,745 | 0.1% | HU, PL, RO, SK |
| **Morocco** | -2,584 | 0.1% | ES |
| **Moldova** | -484 | 0.0% | RO |
| **Total** | **-32,183** | | |

*Source: European Commission based on ENTSO-E Transparency platform and Eurostat (series nrg_cb_e)*
*Note: A negative value indicates net exports from the EU to the respective country.*

## 10.2 Trends in decarbonisation of third countries electricity grids

Several elements indicate that decarbonisation of the electricity grid in exporting countries is expected to progress.

In the Balkans, where countries account for more than half of the total electricity exports to the EU[32], recent policy developments reflect a growing commitment to decarbonising the electricity grid. As part of the Energy Community Treaty, the Contracting Parties are required to prepare National Energy and Climate Plans (NECPs) to 2030, including decarbonisation roadmaps, under the adapted Governance Regulation. They are also obliged to transpose the Renewable Energy Directive (currently RED II, and in the future RED III) into their national legislation once it is incorporated in the Energy Community acquis[33]. Additionally, the New Growth Plan for the Western Balkans, adopted by the European Commission on November 2023, is designed to accelerate the region's integration with the EU by linking financial support to concrete reforms with a strong emphasis on the energy transition. The plan compels countries to align with EU energy and climate ambitions through the deployment of renewables and the integration of their electricity market into the EU. To support this process a new EUR 6 billion financial instrument, the Reform and Growth Facility for the Western Balkans was adopted for the period 2024-2027[34]. Most of the investments in renewables in Energy Community countries stem from the finalisation and operationalisation of projects supported by the

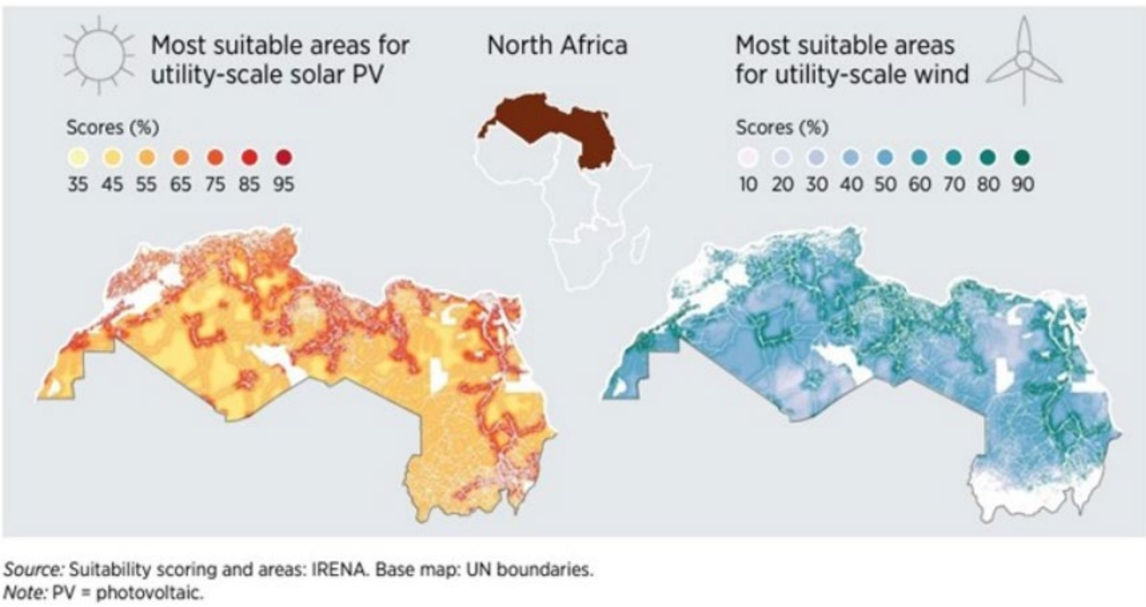
32 ENTSO-E Transparency Platform, https://transparency.entsoe.eu/

33 https://www.energy-community.org/enc-lex/law/treaty.html

34 European Commission (2023) New Growth Plan for the Western Balkans, COM(2023) 691 final

Government (under Feed-in-Tariffs or Feed-in-Premium schemes), together with a significant number of solar PV installations for self-consumption. Furthermore, the North Africa region is emerging as a key region for renewable growth, given the high potential for solar and wind power combined with a decreasing cost of those two technologies[35].

**Figure 35: Most suitable areas in North Africa for utility-scale solar photovoltaic and wind**




Source: IRENA

At COP29 in 2024, the European Commission announced the Trans-Mediterranean Energy and Clean Tech Cooperation Initiative (T-MED). This initiative aims to strengthen collaboration on renewable energy and clean technology across the Mediterranean and Gulf regions by fostering private investments in renewable energy production and transport infrastructure. Under the new Pact for the Mediterranean currently in preparation, the EU is committed to further reinforce its Energy and Technology Cooperation Initiative for the Mediterranean and boost renewable energy trade and clean technology manufacturing in the region.

The strengthened cooperation between the EU and MENA region is also demonstrated through several interconnector projects:

35 IRENA(2024) HYPERLINK "https://www.irena.org/News/articles/2024/Feb/North-Africa-Renewable-Potential-and-Strategic-Location-Reinforce-Its-Role-in-Energy-Transition"https://www.irena.org/News/articles/2024/Feb/North-Africa-Renewable-Potential-and-Strategic-Location-Reinforce-Its-Role-in-Energy-Transition

– The ELMED project, led by Terna (Italian TSO) and STEG (Tunisian TSO), will be the first direct current connection between both continents, with an expected capacity of 600MW[36].
– The EuroAsia Interconnector project is designed to be the world's longest submarine power cable with an interconnector capacity of 1000 MW, linking the power grids of Greece, Cyprus and Israel[37].
– The potential GREGY project, developed by Elica Interconnector, could lead to the construction of an interconnector linking the Greek and Egyptian electricity grid, with a potential capacity of 3000MW[38].

### 10.3 Contextual elements regarding the declaration of actual values for electricity under CBAM

Annex IV, Paragraph 5 of the CBAM Regulation requires five cumulative conditions for applying actual embedded emissions in imported electricity. The modifications of the methodology that are dealt with in this impact assessment relate to three of those five conditions.

- On the Power Purchase Agreement (PPA)

According to the first condition provided in Annex IV, paragraph 5, the amount of electricity for which the use of actual embedded emissions is claimed shall be covered by a power purchase agreement, defined as a contract under which a person agrees to purchase electricity directly from an electricity producer.

Different types of PPAs currently exist and are defined in the Box below.

**Box 1: Typology of PPAs**

*Physical PPAs*

A Power Purchase Agreement (PPA) is a contract in which an electricity generator and a buyer arrange the direct supply of power. Under such an agreement, electricity physically flows from the generator to the buyer (or is at least contractually tracked through a grid or balancing zone). This means the buyer can point to a specific installation producing the electricity covered by the PPA.

*Virtual PPAs*

36 EIB(2024) https://www.eib.org/en/press/all/2024-205-team-europe-commits-eur472-million-to-support-the-elmed-electricity-project-and-its-ecosystem

37 https://www.great-sea-interconnector.com/en

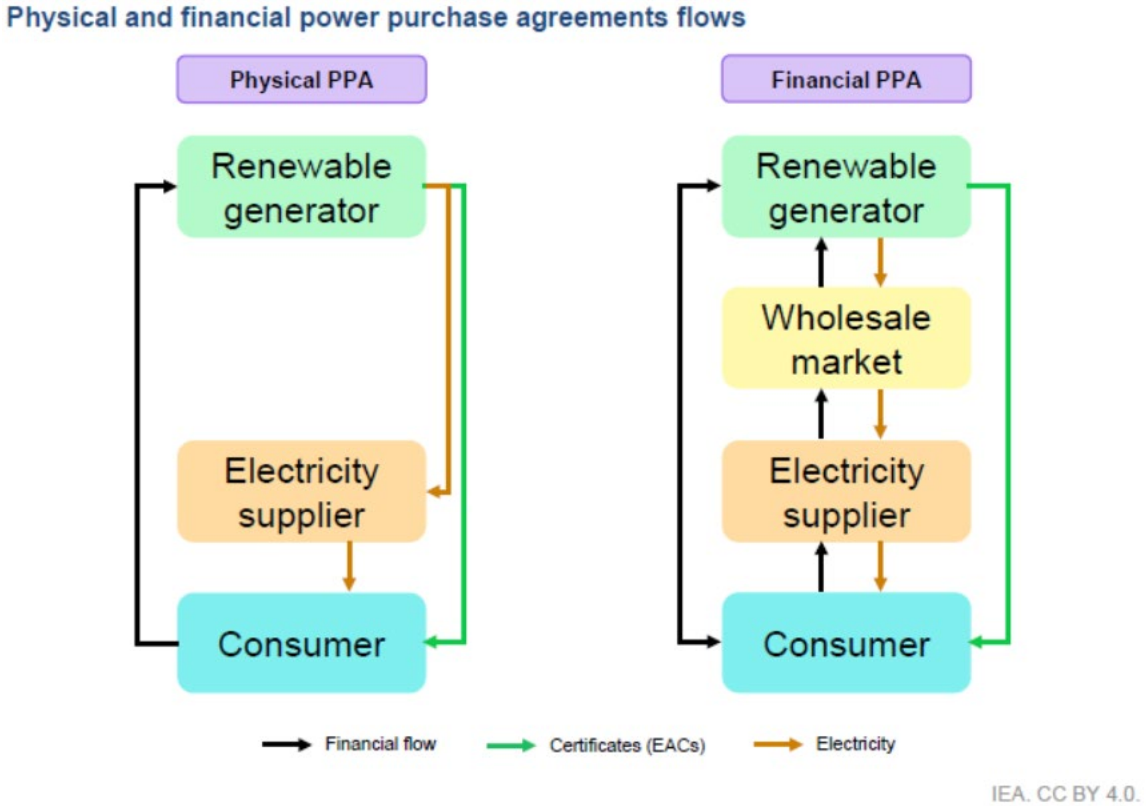
38 https://gregy-interconnector.gr/project_en.html

A virtual PPA (also sometimes called a "financial" or "synthetic" PPA) on the other hand is fundamentally different. Rather than supplying power directly to the buyer, the generator sells its electricity into the local wholesale market. Meanwhile, the buyer and generator enter into a contract-for-differences or similar financial arrangement based on the agreed PPA price versus the actual market price. The buyer therefore does not receive electricity from the generator's plant. Instead, it receives or pays a financial settlement tied to the difference between market rates and the PPA's "strike price." Consequently, virtual PPAs do not allow the identification of a specific installation as the source of the electricity imported, unlike physical PPAs.

*Sleeved/Indirect PPAs*

An indirect PPA refers to a contractual arrangement where the electricity generator and the importer are not directly connected through a bilateral contract. Instead, electricity is procured via an intermediary, typically a utility or trader, who purchases electricity from the generator and sells it onward to the importer under a separate supply contract. In a sleeved PPA, which represents a specific type of indirect arrangement, the importer and the electricity generator agree on the commercial terms of the transaction—such as volume, price, and duration—but the physical delivery of electricity is facilitated through a licensed utility or supplier. This intermediary "sleeves" the electricity through the grid to the importer, handling responsibilities such as grid balancing, regulatory compliance, and sometimes billing. However, the utility does not take ownership of the electricity in a way that severs the contractual link between the generator and the importer.

**Figure 36: Physical vs. financial PPA**




Notes: PPA = Power Purchase Agreement, EAC = Energy Attribute Certificate.
Sources: IEA based on Douglas, B. et.al. (2020), Introduction to Corporate Sourcing of Renewable Electricity in Europe and KYOS Energy Consulting (2022), What is the difference between a virtual and physical PPA?.

- On congestion

The current CBAM Regulation requires the installation producing electricity to be directly connected to the Union transmission system or the absence of physical network congestion can be demonstrated that at the time of export. The current CBAM Regulation does not currently provide a definition for physical network congestion. The Box below outlines different types of congestion.

**Box 2: Congestion in the electricity system**
Article 2 of the Commission Regulation (EU) 2015/122248, related to the establishment of a guideline on capacity allocation and congestion management, provides various definitions of congestion:

- **Physical Congestion** is a network situation where actual or forecasted power violate the thermal limits of the elements of the grid and voltage stability or the angle stability limits of the power system.

- **Market congestion** is a situation in which the economic surplus for single day-ahead or intraday coupling has been limited by cross-zonal capacity or allocation constraints.
- **Structural congestion** is congestion in the transmission system that can be unambiguously defined, is predictable, geographically stable over time and frequently reoccurring under normal power system conditions.

- On capacity allocation

**Box 3: Forms of electricity trading - Capacity allocation**

Electricity trading can occur under explicit or implicit regime:

- Under explicit capacity allocation, cross-border transmission capacity and energy are procured separately. The market participants go through a cross-border transmission capacity auctions and bid to acquire the right to use certain capacity of the interconnector. Once the capacity is acquired (allocated to them), the market participant can purchase separately the electricity from the relevant electricity market. When the market participant purchased electricity and wants to use cross-border capacity, it has to declare ("nominate") it to the TSO, the day before the actual delivery.

- Under implicit allocation, capacity allocation and energy trading are done simultaneously. In this case, the market participants are bidding at their local power exchange for energy and are not required to bid for capacity. In this process market participants do not indicate whether the bid is destined nationally or for import/export. No nomination of capacity as such by market participants occurs. All bids to buy or sell energy are sent to a central algorithm which selects competitive bids and implicitly allocates the capacities.

11

# ANNEX 11: DESCRIPTION OF THE CURRENT RULES FOR THE CALCULATION OF EMBEDDED EMISSIONS

**Current rules regarding the use of Actual Emissions and Default Values**

The current CBAM methodology, that is the rules to calculate and attribute emissions embedded in CBAM goods, is detailed in the Commission Implementing Regulation (EU) 2023/1773. A revision of this methodology is ongoing, in parallel to the preparation of this impact assessment and will be detailed in another implementing regulation which will be adopted before the end of 2025 and apply from 1 January 2026 onwards.

Both the current and revised CBAM methodology place primary emphasis on actual emissions but also allow the use of default values. Therefore, declarants are free to choose either method. Default values are determined by the Commission and are set at the average emission intensity of each exporting country and for each of the goods listed in Annex I other than electricity, increased by a proportionately designed mark-up. In light of its specific nature, the rules are different in the case of electricity for which default values are the general rule and actual emissions can only be used when certain conditions are met.

When declarants choose to report the actual emissions, detailed rules in the CBAM methodology specify how production routes should be monitored and data should be collected to determine the specific embedded emissions of goods, measured in tonnes of CO2e per tonne of good produced. The boundaries of this monitoring and attribution of emissions to goods are limited to processes that would otherwise be subject to the EU ETS if the good was to be produced in the EU.

**Rules for electricity as a CBAM good**

As for the other CBAM goods, the detailed methodology to calculate the embedded emissions of imported electricity is laid down in Commission Implementing Regulation (EU) 2023/1773 for the CBAM transitional phase, whilst another Implementing Regulation will lay down the relevant rules for imports that will occur as of 1 January 2026. The fundamental methodological choices are however defined in the basic act.

Under the CBAM Regulation, electricity importers must declare embedded emissions based on default values, unless certain conditions are met in which case the use of actual values is allowed.

The default values for imported electricity are based on a CO2 emission factor defined as a weighted average of the CO2 intensity of electricity produced from fossil fuels within a geographic area. During the transitional period, the default value is based on International Energy Agency data and calculated as the weighted average of the CO2 emission factor over a five-years period.

Actual emissions can be declared if five cumulative criteria as provided in Annex IV, paragraph 5 of the CBAM Regulation, are fulfilled:

(a) the amount of electricity for which the use of actual embedded emissions is claimed is covered by a power purchase agreement between the authorised CBAM declarant and a producer of electricity located in a third country;

(b) the installation producing electricity is either directly connected to the Union transmission system or it can be demonstrated that at the time of export there was no physical network congestion at any point in the network between the installation and the Union transmission system;

(c) the installation producing electricity does not emit more than 550 grammes of CO2 of fossil fuel origin per kilowatt-hour of electricity;

(d) the amount of electricity for which the use of actual embedded emissions is claimed has been firmly nominated to the allocated interconnection capacity by all responsible transmission system operators in the country of origin, the country of destination and, if relevant, each country of transit, and the nominated capacity and the production of electricity by the installation refer to the same period of time, which shall not be longer than one hour;

(e) the fulfilment of the above criteria is certified by an accredited verifier, who shall receive at least monthly interim reports demonstrating how those criteria are fulfilled.