

FEC Impact Assessment on Carbon Border Adjustment Mechanism (CBAM)

Founded in 1952, FEC, the Federation of the European Cookware, Cutlery and Housewares Industries, represents European companies dealing with cutlery, cookware and other nonelectrical household products used for preparing and serving food as well as for dining.

FEC is a strong network of international companies, major national associations, and key suppliers of our industry. Our mission is to promote cooperation between members and to give fundamental help and support on economic and technical topics. We work to the definition of European regulations and officially represent the common interests of our members before the international authorities and particularly the European Commission in Brussels.

FEC represent 40 members spread over Europe: Belgium, Croatia, France, Germany, Italy, Spain, Switzerland, the Netherlands, the United Kingdom, etc. Our membership consists of companies, national associations, and suppliers for our industry.

TABLE OF CONTENT

TABLE OF CONTENT.....	1
Executive Summary.....	2
1. Study scope.....	4
1.1. General presentation of FEC sector, industrial footprint and employment level in Europe	4
1.2. Baseline definition.....	4
1.3. Methodology.....	5
1.4. Policy options	6
2. Economic Impact Assessment for the FEC sector and policy scenario comparison	8
2.1. CURENT CBAM Scenario	8
2.2. FAIR COMPETITION Scenario.....	10
2.3. PARTIAL Scenarios.....	12
3. Comparative risk assessment of carbon leakage risks for FEC Products.....	15
3.1. Methodology.....	15
3.2. Comparative risk assessment for relevant FEC products.....	15

Executive Summary

The European Union Emissions Trading System (EU-ETS) will begin reducing free allowances of carbon emissions for upstream sectors such as aluminum and steel as of 2026.

To address this potential competitive disadvantage and encourage decarbonization of production, **the Carbon Border Adjustment Mechanism (CBAM)**, was established by Regulation (EU) 2023/956, adopted on 10 May 2023. **This mechanism will impose payable certificates on certain types of goods entering the European Union market** (cement, fertilizers, iron and steel, aluminum, electricity, hydrogen, certain precursors, and some basic downstream goods as screws, bolts, and similar iron and steel articles). These certificates will reflect **the price of allowances under the EU-ETS**. By applying the same carbon price on these imported goods, as if they were produced in the EU, the CBAM aims to maintain fair competition in European markets (vs. imported raw materials) as well as for the European production exported to non-EU markets (vs. non-EU productions).

Due to economical necessities, the additional **carbon cost from upstream sectors will flow down the value chain and impact downstream sectors**. Recognizing this, the CBAM text requests that the European Commission evaluate the inclusion of other downstream goods under the CBAM.¹

Downstream sectors with high level of metal content (e.g., >70%) are not covered by CBAM creating a high risk of “carbon leakage” (i.e. relocation of carbon-intensive production outside the EU, or replacement of EU products by more carbon-intensive imports). The Federation of the European Cookware, Cutlery, and Housewares Industries (FEC) highlights the following impacts for its sector:

- The current EU-ETS/CBAM regulation will **significantly increase the costs of raw materials** (aluminum, steel, stainless-steel) used by FEC European manufacturers in comparison to non-EU manufacturers.
- The competitive disadvantage of European manufacturers will pose a **high risk of European deindustrialization** (-35% of production), **reduction of exports** (-33% sales) and **massive job losses in Europe** (-15 000 direct and indirect employment).
- The additional carbon cost of European productions will induce a consumer switch toward imported goods (not impacted by carbon costs), **increasing direct and indirect CO₂ emissions of the FEC sector by +13%**, due to imports from more carbonized economies and additional sea freight.

FEC recommends a set of complementary measures to the EU-ETS/CBAM (as adopted in May 2023) to maintain a fair competition between EU and non-EU manufacturers in its sector:

- 1) **Extend CBAM Annex1 to cookware, cutlery and non-electrical houseware products at high risk of carbon leakage, such as those with >70% metal content.** Manufacturers of these products are direct customers of the upstream sector, and major providers of value creation and industrial jobs in Europe.

Extension of CBAM Annex1 to these products presents a low complexity (high level and homogeneity of metal content within each product family). For FEC, 8 custom codes are particularly important to include in the Annex 1 extension due to their high metal content and their important production base in Europe: 761510, 732393, 732394, 732399, 732410, 732392, 8211 and 8215.

¹ Art.30 of the CBAM regulation requires the European commission to prepare a report identifying downstream goods to be considered for inclusion in the CBAM scope by 31 dec. 2024 as well as a complementary legislative proposal to address the risk of carbon leakage down the value chain by 31 dec. 2025.

- 2) **Implement a compensation mechanism for European production exported to non-EU markets**, allowing downstream European manufacturers to maintain their competitiveness in those markets which do not have - or have a less restrictive - carbon price mechanism. This export compensation must be monetizable for the downstream manufacturers. **Inward processing or full retrocession of CBAM certificates** would be efficient ways to compensate exports, while “subsidies for decarbonization” are not suitable for downstream manufacturers due to their very low level of carbon intensity (vs. upstream industries)
- 3) **Introduce effective anti-circumvention measures to prevent importation of non-EU products with inaccurate emission factors into the European market.** These measures should cover the risk of **resource shuffling** (non-EU producers directing all ‘green metal’ or ‘recycled metal’ to European markets, while keeping most carbonized products for non-EU markets), the risk of **transfer between custom codes** (EU or non-EU producers changing custom codes or nature of the semi-finished products imported to avoid CBAM) or the risk of **inaccurate emissions certificates** in global supply chains with multiple rank of suppliers and cross-bordering
The scenario based on “country default emission factors” is not developed in this study. That option would prevent most circumvention mechanisms, further reduce direct and indirect CO2 emissions from the FEC sector, while reinforcing the position of European industry.
- 4) **Synchronize the calendars between (i) reduction of free allowances for upstream sectors, (ii) extension of CBAM Annex1 to priority downstream custom codes and (iii) implementation of complementary measures on exports and anti-circumvention for imports.**

The current regulatory text is transferring the socio-economic risk associated to the reduction of free carbon allowance from the European upstream industry to the European downstream manufacturers.

A revision of the measures “a posteriori” and/or prolonged regulatory uncertainty (e.g., Annex 1 extension, circumvention analysis only after two years from introduction) will lead to irreversible carbon leakage and put the dynamic of industrial investments in Europe at risk.

Implementing the above measures will **ensure fair competition between EU and non-EU manufacturers** of FEC products, they will **contain European deindustrialization** (at -3%, from slight demand decrease), **fully mitigate negative impact on European exports**, and induce a **reduction of -6% on direct and indirect CO₂ emissions from the FEC sector** (this reduction is adding-up to the on-going technological improvements on FEC manufacturing, e.g., use of recycled or green metals, key process upgrade like presses & furnaces, ...).

Table 1. Current CBAM Scenario vs. FEC proposed fair competition scenario.

Key figures	CURRENT CBAM SCENARIO <i>Direct and indirect emissions</i>	FAIR COMPETITION SCENARIO
Domestic production	-35% , including domestic and exports	-3% with no impact on exports
Inflation on FEC products manufactured in Europe	+22% for aluminum products +5% for stainless-steel products	+22% for aluminum products +5% for stainless-steel products
Inflation on FEC products imported	+0% as they are currently not submitted to CBAM Annex1	+22% for aluminum products +5% for stainless-steel products
Impacts on employment	-15,000 direct and indirect jobs destruction in Europe	<300 industrial jobs destruction in Europe
CO₂ emissions from FEC sector (direct and indirect)	+13% from consumer switch from European to imported production	-6% from slight FEC market contraction in volume

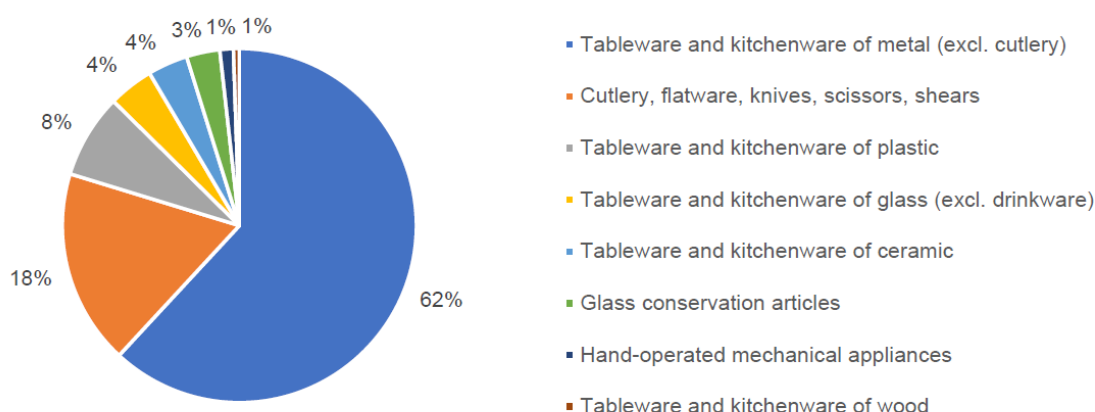
Note: All values are calculated based on a carbon price of €150 per ton in 2040 (constant 2021 euros) which could be conservative considering several studies pointing toward a possible €200 per ton.

1. Study scope

1.1. General presentation of FEC sector, industrial footprint and employment level in Europe

The vast majority of FEC products has a very high content of metal, typically >70% of product weight being steel, stainless-steel or aluminum. This includes Tableware and Kitchenware (including cookware such as pots & pans, pressure cookers), cutlery, flatware, knives... all together constituting 80% of FEC sales on European market.

Figure 4-2 Breakdown of turnover from sales by product grouping⁴⁸



Source: Ricardo analysis based on Eurostat (SBS data). Values are provided in 2021 prices.

Figure 4-2: breakdown of FEC sector's 2021 sales turnover by product, metal-based representing 80% of sales ('Tableware and Kitchenware of metal' and 'Cutlery, flatware, knives, scissors, shears')

The sector represents **more than 32 companies and 60 manufacturing sites located within the EEA and producing in Europe ~50% of the FEC turnover.**

Based on publicly available data and the results of the survey conducted by an independent consultant, it is estimated that **47,000 people worked in this industry in 2021.**

Table 4-1 Number of manufacturing plants by geography

Geography	Number of manufacturing plants, based on the survey data (N=30, capturing around 50% of the sector's sales turnover)
Italy	22
Germany	14
France	9
Rest of EEA	15
Total	60

1.2. Baseline definition

Geographical and market coverage of this study is limited to the European Union (EU), corresponding to the scope of the EU-ETS and the CBAM. The year 2021 is selected for the baseline construction.

The year 2040 is selected as reference year for full application of carbon taxes and stabilization of side-effect and used as reference year for EU-ETS/CBAM impact assessment on FEC sector.

The baseline and projections are based on sectorial studies and publicly available information². The following sectoral reports and interviews were also used to differentiate by type of products (non-metal, aluminum, steel or stainless-steel) and trade flows:

- **FEC market study** (conducted by independent consultancy 'Ricardo' in 2023)
- **IVSH market study** (The German Industrial Association for Cutting and Household Goods)
- **FIAC market study** (Association of Italian Manufacturers of household, table and similar items)
- **FIM impact assessment** (The French Federation of Mechanical Industries)
- **Publicly available studies on carbon policies and carbon trajectories** (emission factor, CO2 price)
- **Historical data and expert views from FEC markets** to understand market price elasticity and scale of economic impacts in the European Union.

The baseline represents the 'business-as-usual' or 'Do Nothing' policy option, illustrating how FEC markets might evolve in the absence of any regulatory actions (i.e., without reduction of free carbon allowances on upstream sectors such as steel, stainless-steel or aluminium production), forming the core of the impact assessment.

The baseline scenario suggests that FEC market will remain broadly stable in real terms up to 2040. Imports and exports, although historically growing, are expected to stabilize, reflecting a stable market environment. Domestic production is expected to grow slightly, reflecting the relocation of some productions in Europe, mainly in aluminum FEC products.

The sales turnover from FEC sector in Europe is evaluated to €5.5B sales in 2021 and projected to grow to €5.8B by 2040 (constant 2021 euros).

By type of material (in constant 2021 euros):

- **Aluminum products projected to grow from €1.2B** in 2021 to €1.3B by 2040
- **Steel or stainless-steel products projected to grow from €3.2B** in 2021 to €3.4B by 2040
- **Non-metal products projected to remain stable at €1.1B** between 2021 and 2040

And by trade flow (in constant 2021 euros):

- **FEC imports projected to decline slightly from €4.7B** in 2021 to €4.6B by 2040, being mainly steel or stainless-steel (65% of imports) and non-metal products (25% of imports). Aluminum FEC products being mainly produced within EU.
- **FEC exports projected to remain stable around €2.1B** between 2021 and 2040, being mainly aluminum (80% of exports) and steel or stainless-steel products (15% of exports).
- **European production projected to grow from €2.9B** in 2021 to €3.2B by 2040, being mainly aluminum (70% of production) and steel or stainless-steel products (25% of production).

1.3. Methodology

Evaluation of policy scenario is based on ETS-4 methodology (as stated in Art. 10(b)(1) of the EU-ETS Directive), **assessing the additional carbon costs impacting production down the value chain, the trade intensity, and therefore determining the risk of carbon leakage** along 4 criteria:

- Evolution of European domestic market on FEC products
- Evolution of European exports of FEC products to non-European markets
- Evolution of imports of non-European FEC products in European soil

² Ricardo made the study based on historical industry and international trade evidence, collected across two primary publicly available datasets from Eurostat: SBS and PRODCOM for the period 2011-2020 (Data for 2021 only available from PRODCOM); as well as drawing from Comext.

- Evolution of FEC production in European soil

The additional carbon cost is based on a **carbon price ranging from €80 in 2026 to €150 per ton in 2040** (constant 2021 euros) with a **gradual ramp-up as of 2026**. This assumption might be **conservative as several studies suggest that the price could reach €200 per ton** between 2035 and 2040.

The following emission factors have been considered based on public data available and sectoral trajectories:

Aluminium emission factor

<u>Direct emission only</u>	2.5	t CO ₂ eq/t
<u>Direct + indirect emissions</u>		
- Produced in Europe	11	t CO ₂ eq/t
- Recycled or produced from renewable energy	2	t CO ₂ eq/t
- Produced in more carbonized economy out of Europe	16 to 20	t CO ₂ eq/t

Steel and stainless-steel emission factor

<u>Direct emission only</u>	1.9	t CO ₂ eq/t
<u>Direct + indirect emissions</u>		
- Produced in Europe	2.1	t CO ₂ eq/t
- Produced out of Europe	2.5	t CO ₂ eq/t

Comparative risk of carbon leakage: a complementary assessment of the risk of carbon leakage, according to the ETS-3 methodology (risk of carbon leakage = trade intensity x carbon intensity) is conducted in Section 3 on illustrative FEC HS codes (aluminium pots & pans HS761510, stainless steel pots and pans HS732393).

1.4. Policy options

Three scenarios considered in this study aim to investigate the impact of EU-ETS/CBAM on FEC sector operating in the EU, as well as beneficial and/or adverse effects from additional measures (ex. extension of CBAM on downstream sector, monetizable compensation for exports, effective anti-circumvention measures for European market). These scenarios are:

1. **CURRENT SITUATION: EU-ETS/CBAM as adopted in 2023, impacting raw material and semi-finished products used in FEC industries.**

This scenario models the impact on FEC markets (imports, exports, domestic production) of implementing EU-ETS/CBAM as adopted on May 10, 2023 (Regulation (EU) 2023/956). The CBAM scope is limited to cement, fertilizers, iron and steel, aluminum, electricity, hydrogen, certain precursors, and specific basic downstream goods (e.g., screws, bolts, and similar iron and steel articles).

As demonstrated in the study, since raw materials (e.g., steel and aluminum) and semi-finished (e.g., steel and aluminum discs under HS 7326 or 7606) currently under the EU-ETS/CBAM are widely used in FEC products, production costs on European soil are heavily affected by the regulation, creating a massive distortion of competition with products imported from non-EU countries, implying high risk of deindustrialization and job destruction for European manufacturer, as well as adverse effect on carbon emissions (switching productions from Europe to third countries with more carbonized economies and additional transport).

The study also investigates the difference between application of EU-ETS/CBAM only on direct emissions only (current text) or extending the scope on direct and indirect emissions (objective already announced by the commission). It will demonstrate that, while the socio-economic and environmental adverse impacts are approximately two-third lower with 'direct emissions only', the overall negative effects for Europe remain significant.

2. **FAIR COMPETITION: EU-ETS/CBAM as adopted in 2023 with (i) FEC finished products added to the CBAM Annex 1, (ii) monetizable export compensation mechanism and (iii) effective anti-circumvention measures for European market.**

- (i) The extension of CBAM Annex 1 to include FEC finished products (FEC products made of aluminium and steel³) aims to maintain a fair competition within EU, between manufacturers based on European soil and imported products, based on high risk of carbon leakage (high carbon intensity, high trade intensity) and low complexity of implementation (metal typically represents >70% of FEC product weight).
- (ii) The complementary export mechanism aims to maintain a fair competition in non-EU markets for the products manufactured in European soil, by compensating the share of carbon tax supported by these products through EU-ETS/CBAM regulations. The evaluated compensation distinguishes between measures similar to inward processing which effectively meet the needs of the downstream sector and is straightforward to implement administratively, and decarbonation subsidies, which only partially address the needs of the downstream sector as detailed in the "PARTIAL" scenario.
- (iii) The complementary anti-circumvention measures for European market aim to prevent the import of third countries production with inappropriate emission factors: resource shuffling (green or recycled metal), transfer between custom codes, inaccurate direct or indirect emissions certificates.

3. **PARTIAL: CBAM with extension of Annex1 to include FEC finished products without monetizable export compensation nor effective anti-circumvention measures for European market**

This scenario models the extension of Annex 1 of CBAM on FEC finished products made of aluminum and steel, without monetizable export compensation nor effective anti-circumvention measures for European market to prevent inappropriate emission factors (resource shuffling, transfer between custom codes, inaccurate direct or indirect emissions certificates)

This represents a plausible yet undesirable scenario.

³ For FEC, those 8 custom codes are particularly important to include in the Annex 1 extension due to their high metal content and their important production base in Europe: 761510, 732393, 732394, 732399, 732410, 732392, 8211 and 8215.

2. Economic Impact Assessment for the FEC sector and policy scenario comparison

2.1. CURENT CBAM Scenario

The EU-ETS/CBAM, as adopted in May 2023, will progressively reduce free allowances for upstream industries as of 2026 (e.g., aluminum or steel production). Upstream industries and a selected number of downstream manufacturer, as listed in CBAM Annex1, will benefit from a carbon compensation mechanism at European border, ensuring to maintain a fair competition European and non-European productions.

European downstream manufacturers not included in the CBAM Annex1 will be directly impacted the distortion of competition induced by the mechanism, to a different order of magnitude between :

- Manufacturers “close to the upstream” (i.e., with high content of raw material impacted by EU-ETS) which will have a direct and high repercussion of the additional carbon cost from upstream industries.
- Manufacturers “very downstream” which will see a minimal impact from additional carbon cost, as it gets diluted with other materials (e.g., electronics, engines, plastics) and value added (e.g., transformation, assembly, R&D costs).

FEC manufacturing activities in the EU, in particular Cookware, flatware and Cutlery, have a very high content of metal (70% to 95% of stainless steel or aluminum content) and will be heavily impacted by the EU-ETS/CBAM regulations. Semi-finished products from the FEC value chain have already been added to the CBAM Annex1 in May 2023, such as aluminum and stainless-steel discs (respectively HS code 760692 and 732690).

The progressive reduction of free allowances within the EU-ETS will lead to an increasingly imbalanced situation for downstream manufacturers, in particular the ones “close to the upstream” with high content of metal like FEC manufacturers, either via the EU-ETS (for domestic raw materials/ semi-finished) or via CBAM (for imported raw materials/ semi-finished).

Non-EU manufacturers of FEC products are not subject to any similar carbon price, neither on raw materials and energy used during production, nor on finished manufactured goods entering the EU market (as CBAM does not cover them).

Based on economic data from our industry (imports, exports, domestic production, market value, industrial and commercial employment), as well as direct and indirect CO2 emissions trajectories from aluminum and steel sectors, the FEC assesses the following impact for European companies:

- **Raw material costs are expected to rise by 2040, in the order of +11% for steel and stainless-steel and by +55% for aluminum**, considering full application of EU-ETS/CBAM (at constant 2021 euros, all other things being equal).
- **Carbon inflation of FEC products manufactured in Europe is expected at +22% for aluminum products (e.g., pans) and 5% for stainless-steel products (e.g., cutlery, pans), while imported FEC products will suffer from no carbon inflation** as they are not submitted to CBAM nor carbon costs (in 2040 at constant 2021 euros)
- **European consumer inflation for FEC products is expected to reach 11% for aluminum and 1% for stainless-steel products**, this being the **result of a massive consumer switch from highly inflated European productions (e.g., +22% for aluminum pans) toward imported goods at**

constant price, reducing the European production for domestic market by -39% while increasing imports by +8% (in 2040 at constant 2021 euros).

- A similar mechanism will negatively impact European exports (-33% or -650M€ of sales), leading to an **overall reduction of European production by -35% and to the destruction of 15.000 employment in the EU.**
- The massive consumer switch from European productions to imported products will have an **adverse environmental effect, increasing by +13% CO2 emissions from FEC sector through additional sea-freight and import from more carbon-intensive economies** which are less decarbonized than Europe.

CONCLUSION ON CURRENT CBAM SCENARIO (AS ADOPTED IN MAY 2023)

The distortion of competition resulting from the current CBAM regulation will result, for FEC markets and products, in:

- **A significant inflation for European consumers, leading to massive transfer from European production to imports from third countries.**
- **A massive reduction of European exports, further degrading European commercial balance with non-EU countries.**
- **A severe deindustrialization of the European economy and destruction of 15.000 employment on European soil.**
- **Adverse effect, in opposition to the very principles and objectives of the carbon taxes, increasing direct and indirect carbon emissions from FEC industry through more imports from more carbon-intensive economies and additional transport.**

The current CBAM scenario fails to address the risk of carbon leakage down the value chain and provides a financial incentive for investors and producers to relocate manufacturing activities outside Europe to maintain profitability.

Complementary adjustments to maintain a level playing field for downstream producers and to incentivize less carbon-intensive productions are assessed in the “FAIR Competition Scenario”.

Current CBAM Scenario – key figures /!\ direct and indirect emissions	
Domestic production	-35% , including domestic market and exports
Inflation on FEC products manufactured in Europe	+22% for aluminum products (e.g., pans) +5% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products imported	+0% as they are currently not submitted to CBAM Annex1
Impacts on employment	-15,000 direct and indirect jobs destruction in Europe
CO2 emissions	+13% direct and indirect CO2 emissions from consumer switch from European to imported production of FEC products

Similar analysis on direct emissions only would reduce the adverse by ~2third but not changing the overall negative socio-economic and environmental effects for Europe:

Current CBAM Scenario – key figures /!\ direct emissions only	
Domestic production	-12% , including -19% for domestic market and -8% for exports
Inflation on FEC products manufactured in Europe	+5% for aluminum products (e.g., pans) +5% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products imported	+0% as they are currently not submitted to CBAM Annex1

Impacts on employment	-5,000 direct and indirect jobs destruction in Europe
CO2 emissions	+3% <u>direct</u> emissions switching from EU to imported production

2.2. FAIR COMPETITION Scenario

The FAIR Competition Scenario evaluates the socio-economic impacts of complementary adjustments to the CBAM to maintain a level playing field for downstream producers most impacted by additional carbon cost, on a basis of the direct and indirect CO2 emissions.

Public policies included in the assessment for the “Fair competition scenario” are the following:

- 1) **CBAM extension to downstream sectors with high risk of carbon leakage, e.g., >70% of metal content like FEC products:** ensuring that cookware, cutlery, and hollowware produced in non-EU countries would be subject to the same carbon pricing as European production, maintaining a level playing field within the European domestic market.
- 2) **A compensation mechanism for exports which the downstream sector can monetize: via the introduction of a compensation mechanism to maintain fair competition for European-produced downstream goods in non-EU markets.** This policy aims to fully compensate the carbon tax incurred through production on European soil, **potentially through Inward Processing or full retrocession of CBAM certificates for exports.**
Subvention mechanism (e.g., subvention to decarbonation) are not suitable for downstream manufacturer, which are not carbon intensive: it is estimated that the amount of subvention collected in a single year for export compensation, equals to more than 10 years of investments on decarbonation projects.
- 3) **Anti-circumvention measures for European market:** preventing imports from third countries with inaccurate emission factors to dump European productions. This includes resource shuffling (non-EU producers directing all green or recycled metal to European markets, while keeping most carbonized products for non-EU markets), transfer between custom codes (EU or non-EU producers changing custom codes or nature of the semi-finished products imported to avoid CBAM) and inaccurate direct or indirect emissions certificates. Such measures are critical to ensure maintaining a level playing field for European producers of downstream products.

The modeling hypothesis assumes that emission factors from more carbon intensive economies cannot be lower than average emission factor of the EU. This mechanism is virtuous at global level, as it would incentive non-EU producers to reduce their emission toward the EU average, and it would incentive EU producer to decrease below the EU average in order to gain a competitive advantage.

The impact assessed from this scenario results in a mitigation or a turnaround of adverse effects from the current CBAM proposal:

- **Carbon inflation at similar level between FEC products manufactured in Europe and imported ones, maintaining a fair competition at European border.** Overall price increases of +22% for aluminum products (e.g., pans) and 5% for stainless-steel products (e.g., cutlery, pans) will result in a **FEC market contraction of -5.2% (in volume).**
- **European exports of FEC products will not be impacted and stabilized at ~2B€ exports,** as a monetizable compensation for exported goods would allow European producers to maintain a fair competition in non-EU markets.

- **European production would be maintained at a stable level**, with slight decrease of -3% in volume over time, implying **almost no destruction of industrial employment on European soil** (<300 industrial job destruction). This slight decrease is the result from the FEC European market contraction linked to additional carbon cost, and **imports of FEC product would be impacted with a similar order magnitude** with a decrease of -4%.
- **Environmental benefit of carbon taxes is positive in this scenario, with a mechanical reduction of -6% on direct and indirect CO2 emission from FEC market** compared to the baseline. This is the result from the FEC market contraction (in volume) linked to the additional carbon cost supported by the end consumer, and that the more carbon intensive products (e.g., aluminum based) will see a slightly higher contraction than the overall FEC market due to higher relative inflation for end consumer.
- **Any technical improvement to reduce CO2 emissions during on production processes would add up to this mechanical reduction**, as incentivized by the overall carbon tax scheme (e.g., recycled or green metals)

CONCLUSION ON FAIR COMPETITION SCENARIO

The 3 proposed adjustments can mitigate or turnaround adverse effects from the current CBAM proposal (as assessed in previous chapter):

- European deindustrialization contained, implying destruction of almost no industrial employment on European soil (<300 industrial job destruction)
- European exports maintained at equal level, the compensation fully offsetting the additional carbon cost for exports to non-EU countries.
- Significant inflation for European consumer, higher than the current CBAM scenario but at similar level of magnitude, leading to an overall reduction of FEC market in volume.
- An overall reduction of direct and indirect carbon emissions from FEC industry by -6%, on-top of on-going technical improvements at FEC sector (e.g., recycled or green aluminum)

The 3 following adjustments are necessary to ensure a comprehensive mitigation of adverse effects resulting from the current CBAM proposal, on global CO2 emissions and on European industry:

- CBAM extension to downstream sectors with high risk of carbon leakage, e.g., >70% of metal content like FEC products
- A compensation mechanism for exports which downstream sector can monetize, e.g., through Inward Processing or full retrocession of CBAM certificates for exports. Subvention mechanism (e.g., subvention to decarbonation) are not suitable for downstream manufacturers.
- Anti-circumvention measures for European market preventing imports from third countries with inaccurate emission factors to dump European productions.

The following chapter will assess the impacts of a partial application of these 3 adjustment proposals.

FAIR COMPETITION Scenario – key figures	
Domestic production	-3% with no impact on exports (fully monetizable compensation for export) and ~similar impact on imports of FEC products (-4%)
Inflation on FEC products <u>manufactured in Europe</u>	+22% for aluminum products (e.g., pans) +5% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products <u>imported</u>	Equal to products manufactured in Europe (included in CBAM Annex1 with effective anti-circumvention measures in place)
Impacts on employment	<300 industrial jobs destruction in Europe

CO2 emissions	-6% direct and indirect CO2 emissions from overall FEC market contraction in volume
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2.3. PARTIAL Scenarios

The analysis of partial scenarios aims to highlight the necessity of all complementary measures detailed in the “FAIR COMPETITION Scenario”, analyzing the adverse effects of partial measures.

1. Extension of CBAM Annex1 to include FEC HS codes, without monetizable export compensation nor effective anti-circumvention measures for European market.

- Without monetizable export compensations, European productions will suffer from competitive disadvantage on non-EU markets, resulting from the additional carbon cost of producing on European soil, and loose significant market share in these markets.
- Without effective anti-circumvention measures for European market, FEC producers on European soil face the risk of an untruthful competitive disadvantage, e.g.,
 - i. **Resource shuffling:** manufacturers from third countries directing ‘metals produced in the least carbon-intensive facilities’ or ‘recycled metals’ to European markets, allowing non-EU productions to be imported in EU with very low emission factors (based on the ‘real value’ certificate), while the most carbon-intensive productions would be directed to non-EU markets, therefore not reducing the overall CO2 emissions.
 - ii. **Report between custom codes:** EU or non-EU producers changing custom codes or nature of the semi-finished products imported in Europe, to avoid falling under CBAM regulation and consequent additional carbon costs.
 - iii. **Inaccurate direct or indirect emissions certificates:** ensuring reliability of the ‘real value declarations’ in global supply chains involving multiple rank of tier suppliers and multiple cross-bordering along the value chain.

In order to simulate effects of circumvention mechanism, this scenario assumes that imported goods from non-EU countries will be at emission factor of “green or recycled metal”.

This scenario fails to mitigate almost all adverse effects of the current EU-ETS/CBAM regulation, maintaining a high distortion of competition between European and non-EU producers for both European and export markets.

It therefore results in a massive transfer from European production to imports from third countries, a massive reduction of European exports further degrading European commercial balance with non-EU countries, a severe deindustrialization of the European economy and destruction of ~15.000 employment on European soil, an increase of direct and indirect carbon emissions from FEC industry through more imports from more carbon-intensive economies and additional transport.

PARTIAL SCENARIO #1 – key figures	
Domestic production	-32% , including -33% for export and -39% for domestic market
Inflation on FEC products manufactured in Europe	+22% for aluminum products (e.g., pans) +5% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products imported	+4% for aluminum products (e.g., pans) +2% for stainless-steel products (e.g., cutlery, pressure cooker)
Impacts on employment	-15,000 direct and indirect jobs destruction in Europe
CO2 emissions	+11% direct and indirect CO2 emissions from consumer switch from European to imported production of FEC products

2. **Extension of CBAM Annex1 to include FEC HS codes with effective anti-circumvention measures for European market (but no compensation for export)**

- In order to simulate effects of effective anti-circumvention measures, this scenario assumes that **imported goods from non-EU countries (more carbon intensive economies and additional transport) cannot be, in average, at a lower emission factor than goods produced in Europe.**
- Simulation methodology assumes an emission factor for goods imported in Europe at an equal level than the European productions.
- This scenario **could reflect the real-life impact of effective anti-circumvention measures to fully avoid inaccurate data of “real emissions”**, with some imported production being at lower factor than European production, and some others at higher factor.
- This scenario **could reflect the impact of a typical and effective countermeasure, though the introduction of a “floor-threshold” rule**: a more carbon intensive economy than Europe cannot import goods within the EU with lower emission factor than the average of European production for a given HS code.

This scenario strongly mitigates the impact on EU economy for the production of goods sold in the domestic European market, resulting in a slight decrease of European production for domestic market linked to (i) product mix between aluminum (higher share of production in Europe, higher additional carbon cost) and steel or stainless steel (higher share of import, lower additional carbon cost) and (ii) consumer being more inclined in an inflationary context to report toward lower price points (usually imported) vs. higher price points (usually produced in Europe)

It however fails to mitigate adverse effects of the current EU-ETS/CBAM regulation for the European production exported to non-EU markets, therefore resulting in a massive reduction of European exports further degrading European commercial balance with non-EU countries, a high deindustrialization of the European economy and destruction of ~2.500 industrial jobs on European soil, an increase of direct and indirect carbon emissions from FEC industry through replacement of European exports by productions from more carbonized economies.

PARTIAL SCENARIO #2 – key figures	
Domestic production	-24%, including -9% for domestic market and -33% for export (no compensation in place in this scenario)
Inflation on FEC products manufactured in Europe	+22% for aluminum products (e.g., pans) +5% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products <u>imported</u>	Equal to products manufactured in Europe (included in CBAM Annex1 with effective anti-circumvention measures in place)
Impacts on employment	-2,500 industrial jobs destruction in Europe, linked to export (no compensation in place in this scenario)
CO2 emissions	+5% direct and indirect CO2 emissions from European exports being replaced by productions from more carbonized economies

3. **Extension of CBAM Annex1 to include FEC HS codes with effective anti-circumvention measures for European market, and compensation for export though decarbonation investment subsidies.**

- It is estimated that the additional carbon cost to be compensated for European FEC production exported to non-EU countries, will amount ~€350M in 2040 (constant 2021 euros)

- The downstream sector, particularly **FEC sector, is not carbon intensive in its transformation and assembly process. For FEC sector, 90-95% of the direct and indirect emissions from the finished product are linked to upstream metal production process.** The remaining 5-10% of the direct and indirect emissions are related to the FEC transformation and assembly process.
- Consequently, **decarbonation projects for FEC sector are less numerous and less costly than the projects in upstream industries subject to EU-ETS.**
- For example, an internal FEC study indicates that one year of carbon subsidies related to exports (~€350M in 2040 at constant 2021 euros) equals to more than 10 years of decarbonization investment for the entire FEC sector in Europe.
- In order to simulate effects of an “export compensation through decarbonation subsidies” for the FEC sector, it is assumed that **only 10% of the compensation will be actually monetizable by European producers (1 year of compensation representing more than 10 years of decarbonization investment for the entire FEC sector in Europe).**
- Comparison of measures: Inward processing or a fully monetizable retrocession of CBAM certificates completely mitigate the distortion effect on export markets. Conversely, subsidies for decarbonization, do not level the playing field in third country markets. In this scenario, the export of FEC aluminum products decreases by 36%, compared to a 40% decrease in the CBAM current scenario.

This scenario fails to provide an efficient and monetizable compensation for additional carbon cost supported by European productions exported to non-European market, therefore creating a high disruption of fair competition in non-EU markets between EU and non-EU manufacturer. This will result in a massive reduction of European exports further degrading European commercial balance with non-EU countries, a high deindustrialization of the European economy and destruction of ~2.500 industrial jobs on European soil, an increase of direct and indirect carbon emissions from FEC industry through replacement of European exports by productions from more carbonized economies.

Only monetizable compensations for exports (e.g., similar to inward processing) can address competition distortion on export markets for downstream sectors.

PARTIAL SCENARIO #3 – key figures	
Domestic production	-22% , including -9% for domestic market and -30% for export (no compensation in place in this scenario)
Inflation on FEC products manufactured in Europe for export	+20% for aluminum products (e.g., pans) +4% for stainless-steel products (e.g., cutlery, pressure cooker)
Inflation on FEC products manufactured in non-EU	0% as no additional carbon cost applies in non-EU production area for non-EU markets
Impacts on employment	-2,500 industrial jobs destruction in Europe, linked to export (no efficient and monetizable compensation in place in this scenario)
CO2 emissions	+5% direct and indirect CO2 emissions from European exports being replaced by productions from more carbonized economies

3. Comparative risk assessment of carbon leakage risks for FEC Products

In parallel of the quantitative impact assessment, a complementary comparative carbon leakage risk assessment is conducted according to the EU-ETS methodology.

3.1. Methodology

The carbon leakage risk assessment methodology, as stated in Art. 10(b)(1) of the EU-ETS Directive to identify downstream goods at risk of carbon leakage, is based on:

- **Trade intensity (TI):** representing the degree of openness/exposure to international trade, considering both imports and exports (expressed in %).

$$TI = \frac{\text{Total exports to Non - EEA (€)} + \text{Total imports from Non - EEA (€)}}{\text{Annual turnover} + \text{total imports from Non - EEA (€)}}$$

- **Carbon intensity (CI):** representing quantity of CO₂ emissions per Euros of value added in the production, therefore reflecting the impact of additional carbon cost relatively to the cost of the production (expressed in %).

For downstream sector, indirect emissions are calculated to cover both electricity consumption of the downstream transformation processes, and the direct emissions of the upstream sector (raw material used as intrant for downstream processes)

$$CI = \frac{\text{Direct and indirect emissions (kg CO}_2\text{)}}{\text{Gross value added (€)}}$$

- **Thresholds:** EU-ETS Phase IV (2021-2030) considers products at risk of Carbon leakage if (TI) x (CI) exceeds 0.2⁴. This is reflecting a conjunction of both “high exposure to international trade” and “high impact of additional carbon cost relatively to the cost the product”.

3.2. Comparative risk assessment for relevant FEC products

Calculation on **product categories highly representative of FEC products and with high economical relevance for FEC sectors in Europe**, indicates a “High” to “Very High” risk of carbon leakage for these product categories, the **results of the comparative risk assessment being 3 to 10 times above the threshold set by the EU-ETS Phase IV (2021-2030)**

	Custom Codes	% metal in product weight	Trade Intensity (TI)	Carbon Intensity (CI)	(TI) x (CI)
Aluminum pan 	761510 <i>Includes aluminum pots, pans, pressure cookers and other aluminum products (soup ladle, tea infuser, aluminum foil, aluminum gloves)</i>	75 to 85%	87%	225%	1.95 → Very high risk of carbon leakage (10 times above 0.2 threshold)

⁴ Directive 2003/87/EC of the European Parliament and of the Council, of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC.

Art. 10(b)(1): “Sectors and subsectors in relation to which the product resulting from multiplying their intensity of trade with third countries [...] by their emission intensity [...] exceeds 0.2, shall be deemed to be at risk of carbon leakage. Such sectors and subsectors shall be allocated allowances free of charge for the period until 2030 at 100% of the quantity determined pursuant to Article 10a

Stainless-steel pots 	732393 <i>Includes aluminum pots, pans, pressure cookers and other stainless-steel products</i>	75 to 93%	55%	116%	0.64 → High risk of carbon leakage <i>(3 times above 0.2% threshold)</i>
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FEC manufacturers in Europe are highly exposed to risk of carbon leakage with 8 priority custom codes of high economical relevance:

FEC product description	HS Code	Proportion of metal in product weight
Aluminum: pots, pans	761510	>70%
Stainless-steel: pots, pans, pressure cooker	732393	>70%
Steel: pots, pans	732394	>70%
Boards	732399	>80%
Stainless Steel sink bowls	732410	>80%
Enamelled cast iron cookware	732392	>80%
Knives	8211xx	>80%
Set of forks, spoons, table knives	8215xx	>80%

The results of the “Comparative Risk Assessment” on FEC products corroborates the “Economic Impact Assessment” detailed in previous sections and justifies, according to the EU-ETS Phase IV (2021-2030) methodology, the extension of CBAM Annex1 to the FEC HS codes (or at least the 8 priority HS codes)

As detailed in the previous sections, an effective and monetizable compensation for exports (e.g., through inward processing) and effective anti-circumvention measures to prevent imports from third countries with inaccurate emission factors are crucial complementary measures to the extension of Annex1.