Extending the scope of the EU CBAM to downstream goods

Topic: Input-Output Modelling: Energy policies (3)
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1. Research Question

The EU Carbon Border Adjustment Mechanism (CBAM) became fully operational in 2026, imposing financial obligations on imports of cement, aluminum, fertilizer, iron, steel, electricity, and hydrogen into the EU. CBAM aims to prevent leakage, but the phase-out of free allowances in the EU ETS alongside CBAM's introduction will raise prices, impacting producers reliant on CBAM-covered inputs. This is crucial for sectors like metal products, where production relocation could occur, especially for simpler goods. For example, increased steel import costs might shift vehicle parts production, causing carbon leakage if steel is produced with higher emissions outside the EU. To address this leakage channel, the European Commission proposed an CBAM extension to also include upstream emissions (i.e. from the production of intermediate inputs already covered by CBAM) in downstream goods in late 2025 (European Commission, 2025). What are the implications of this extension for EU downstream sectors' competitiveness?

2. Method Used

We employ the JRC-GEM-E3 model, a global dynamic computable general equilibrium (CGE) model, to examine the cost impact on downstream sectors due to CBAM and its potential extension. The model covers the EU 27 Member States individually and 23 other major regions, providing detailed sectoral energy disaggregation and carbon emission mechanisms. Our scenario analysis includes a baseline that models the phaseout of free allowances in the EU ETS and CBAM phase-in. We then run several policy scenarios to model a possible extension of CBAM to cover further downstream products at Combined Nomenclature - CN code level, with options ranging from the narrower Option 1 (70-80 additional CN codes) to Option 2 (150-180 CN codes) and the broadest Option 3 (230-250 CN codes).

3. Data Used

To capture CBAM's sectoral effects, we enhanced JRC-GEM-E3 model granularity using the GTAP 11 Circular Economy database (Chepeliev et al., 2026), detailing aluminium, fertilizers, cement, iron, and steel production. This dataset includes trade statistics, reflecting input structure and trade intensity differences. For each CN code, the weight share of metals subject to CBAM and the relative importance of the product in the more aggregate JRC-GEM-E3 sector is considered to calculate the share of emissions that would be covered by CBAM. To further reflect the role of ETS free allocations and the corresponding CBAM factor for imports of goods covered (i.e. a factor that lowers payments for importers to the extent that EU producers enjoy free allowances during the gradual phase-in until 2034), an adjustment 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 Vidovic et al. (2023). To assess the policy scenarios, the share of emissions originating from metals production embodied in the trade of downstream products was determined by using detailed trade data at product level from Eurostat.

4. Findings

Model simulations suggest a downstream extension reduces global GHG emissions, preventing leakage. Emissions drop in both downstream and CBAM sectors, but only CBAM sector emissions trigger payments. Option 2 achieves most environmental benefits, whereas adding more CN codes increases administrative burden with limited extra benefits. In downstream impacts, fabricated metal products show the largest output rise. Estimated output increases by 0.07% under Option 1, 0.16%

under Option 2, and 0.19% under Option 3 in 2035, driven by reduced import demand, with affected sector imports declining up to 1.4%.

5. Novelty of the Research

This proposal to extend CBAM to downstream goods has not been evaluated in existing literature. This study assesses the CBAM scope extension's implications for carbon leakage and global GHG emissions. It identifies the most effective policy option for environmental impact without excessive administrative burden.

References:

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