

The European Green Deal: understanding the relevance of domestic climate policy details, CBAM's embedded emissions and exporters' carbon price rebates.

Introduction and objectives

The emission reduction targets outlined in the Paris Agreement and in the latest country-specific Nationally Determined Contributions (NDCs) are unlikely to reduce greenhouse gas (GHG) emissions to achieve temperature goals (IPCC 2023). In fact, many countries' pledges fall short of the required reductions,¹ and most countries are proceeding unilaterally. For example, the European Union (EU) is rolling out its European Green Deal plan by implementing an array of policy measures. The domestic climate measures by the EU encompass a broadened sectoral scope and higher reduction goals for the EU-wide emission trading system (EU ETS),² a new EU ETS2 covering emissions from transport and buildings,³ reinforced reduction targets under the EU Effort Sharing Regulation (EU ESR),⁴ and other measures. Several trade-related measures complement the domestic climate efforts. Among these, the most discussed in the international public fora is the EU Carbon Border Adjustment Mechanism (CBAM),⁵ which effectively imposes a carbon price equal to the EU ETS carbon price on the GHG emissions embedded in imported energy-intensive trade-exposed (EITE) products.

A number of papers have analyzed the current EU CBAM (Clora, Yu, and Corong 2023; Bellora and Fontagné 2023; UNCTAD 2021; Perdana and Vielle 2023), and more generally border carbon adjustments (BCAs) (Böhringer, Balistreri, and Rutherford 2012; Böhringer et al. 2022). Other alternatives to reduce carbon leakages have also been suggested and analyzed (Grubb et al. 2022; Martin 2023; Bellora and Fontagné 2023), such as for example free allocations of emission permits to sectors exposed to carbon leakage.⁶ However, to the best of our knowledge, in most modeling exercises, domestic sectoral policies are represented in a rather stylized fashion, e.g. imposing two carbon prices on the EU ETS and EU ESR sectors, not fully capturing newly implemented EU ETS2 or sub-regional climate policies and/or sectoral emission targets. In addition, while several studies have analyzed and compared the relevance of including scope 1 and scope 2 emissions in the CBAM and the different climate and economic implications (Clora, Yu, and Corong 2023; Bellora and Fontagné 2023), none have focused on modeling and analyzing the significance of rebating the domestic carbon price paid by non-EU exporting firms to compensate for the higher carbon price faced domestically, compared with firms in the country to which they are exporting.

Including the two abovementioned dimensions in the economic modeling of EU CBAM (and potentially other CBAMs) is of fundamental importance for generating nuanced insights on the

¹ <https://climateactiontracker.org/global/temperatures/>

² https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en

³ https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets-2-buildings-road-transport-and-additional-sectors_en

⁴ https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en

⁵ https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en

⁶ https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en

potential alternative policies to reduce carbon leakage and their impact on bilateral trade flows, production and emissions. In this paper, we simulate and analyze six core scenarios. In the first scenario (S1), we model climate policy in all regions, capturing domestic policy details for selected sectors (e.g. EITE) and countries (EU and major GHG emitters). In the three following scenarios, three policies to mitigate the competitiveness impacts and to increase the emission effectiveness of EU climate policy are simulated. S2 simulates an exemption from paying the EU ETS carbon price for the EITE sectors, S3 simulates an EU CBAM on EITE imports based on scope 1 emissions, S4 simulates an EU CBAM on EITE imports based on scope 1 and 2 emissions. Finally, scenarios S5 and S6 simulate the same EU CBAM as in S3 and S4, respectively, but rebating the domestic carbon price paid by non-EU exporting firms.

Methodology (model and baseline)

To simulate the scenarios, we use the GTAP-E-CP model (Clora, Corong, and Yu 2023), which extends the GTAP-E version 7 model, by implementing a flexible approach to represent carbon pricing and CBAMs. In addition to the GTAP-E version 7 model, GTAP-E-CP allows users to implement national/international emissions trading systems (ETS) or carbon taxes with flexible sectoral coverage, to partially or fully exempt selected agents (sectors or private households) from facing carbon prices, and to impose carbon taxes not only on CO₂ but also on non-CO₂ emissions. It also introduces mechanisms to explicitly model alternative CBAM designs (e.g. covering different emission scopes, or fully or partially rebating domestic carbon prices paid by the exporting firms).

The model is calibrated on the GTAP-E v11 Data Base, with 2017 base year. The initial 2017 data are updated to recreate a baseline towards 2030, using external data on macroeconomic drivers following business-as-usual developments, e.g. following SSP2 (Dellink et al. 2017; Kc and Lutz 2017). Additional relevant sector-specific developments will also be introduced in the updated baseline.

Expected results

The new GTAP-E-CP model is used to simulate and compare alternative policy measures to reduce carbon leakages arising from unilateral EU climate policy, complementing its domestic climate policy. This study will shed light on potential impacts of these alternative policies on production, trade flows and GHG emissions. The analysis will focus on the EU vis-à-vis its major trade partners, and on global implications of these alternative measures.

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