

Emissions embodied in international trade: an application to the French case

Topic: (4.1) Consumption-based accounts

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Environmental progress achieved by a country depends on the scope given to the greenhouse gases (GHG) emissions inventory. In United Nations Framework Convention on Climate Change (UNFCCC) territorial-based inventories, the emissions embodied in international trade are not assessed while they warn about carbon leakage and represents a lever to understand competitiveness concerns. The assessment of emissions embodied in international trade is not straightforward and different methods exist to evaluate alternative emissions inventories. However, methods are data-intensive and models mainly rely on existing global databases with balanced bilateral trade flows. The control of these databases and the articulation with country-scale prospective models remain difficult.

We propose a single-region method to account CO₂ emissions with different perspectives of inventories, moving them from a production-based to a consumption-based point of view. To do so, the method also assesses emissions embodied by its external trade while taking into consideration major specificity of partner countries. Furthermore, for each inventories, sectors that drive emissions, and thus that represent a lever for environmental efforts, are identified. The technique relies on hybrid national-scale data to then be articulated with a prospective general equilibrium model.

The procedure is applied as a study case to France (2010) which energy transition law now provides for territorial emissions reduction targets without increasing embodied emissions in its imports. The results show that the differences between French CO₂ emission inventories, taking or not into account emissions embodied in international trade are not substantial. It also appears that if France had produced its own imports, it would have caused fewer CO₂ emissions. Finally, assessing different accounting system of CO₂ emissions lead to different sectoral distribution although results are sensitive to the level of initial description.