

## **Global Integration and Carbon metabolisms in the EU: A 2-regional Input-Output Framework**

Topic: Environmental IO models 4

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So far, carbon intensities have been used widely in modelling the effectiveness of emission policy instruments, e.g. emission taxes or cap-and-trade system. However, computation of fossil carbon flows, would help develop an alternative carbon policy instrument. We compute carbon metabolisms, for EU and rest of the world (ROW) with the help of a two-regional input-output analysis. The carbon metabolism is calculated on the basis of the mass-balance principle and the Leontief multipliers.

A linear multiplier analysis with different scenario settings is used to evaluate the carbon metabolisms due to inter-regional consumptions and productions interdependencies. By adding an income flow account that links production, income and household expenditures captures flows among different activities and circular transmissions within the economy and between the regions. Then the IO model is run for different scenarios. In each scenario, we set alternative production and household accounts for EU and ROW as exogenous, while the rest is set as endogenous. This results in different sets of induced multipliers and hence carbon metabolisms due to endogenous effects of alternative accounts. The methodology helps in assessing the contribution of trade in generating carbon metabolisms. Alternative scenario settings also appraises carbon metabolisms due to (a) domestic inputs, (b) foreign inputs, (c) household consumptions of domestic goods, (d) consumptions of foreign goods, and (e) foreign demands for domestic consumer goods. As the computation of carbon metabolisms also depends on the IO multipliers, setting alternative scenarios in exogenous accounts would influence the multipliers and hence, the carbon metabolisms.