Mapping inter-industrial CO2 flows within China

Like inter-regional CO2 leakages, good CO2 emission performances from downstream industries in the industrial chain often result in high direct levels of CO2 emissions in upstream sectors. Thus, it is necessary to rethink industrial carbon policies from the perspective of consumer responsibility. As the largest emitter of CO2 in the world, China has a very comprehensive industrial system. In this study, we traced fuel-related CO2 flows between 30 Chinese industrial sectors in 2012 and explored the specificities of these flows on aggregate CO2 emission abatement for the entire economy. Previous studies have focused on carbon abatement policies instituted by industries generating high direct CO2 emissions, but our results demonstrate that paying more attention to CO2 importers better limits the consumption of energy-intensive materials. The construction sector, a major CO2 flow destination because of the large-scale infrastructure required to support rapid urbanization in China, exhibits the greatest transfer of embodied CO2 from energy suppliers and from the producers of energy-intensive materials. Our sensitivity analysis indicates that the construction sector shows considerable carbon abatement potential, which is surprisingly much greater than what is feasible for most high-carbon industries. Shifting more attention to industries that consume large amounts of embodied CO2 may help achieve more cost-effective decreases in CO2 emissions in absolute terms.

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