

Recommendations for climate policy to address consumption-based emissions

Given the extensive linkages via international trade, there is a strong deviation between production based (territorial) and consumption based emissions of a country. Consumption based emissions are those emissions arising in a country – we here analyse in particular Austria – and abroad that can be attributed to final consumption in that country (here: to Austria).

For Austria, consumption based emissions in 2011 are 124 Mt CO₂e as compared to 80 Mt CO₂e for production based emissions (Steininger et al. 2018). This difference is due to several facts: GHG emissions are contained in products consumed in Austria also because of intermediate and final goods that are produced abroad. Austria tends to import goods that have a higher GHG intensity per output value than the goods produced in Austria. This higher GHG intensity in imports is due to both (a) higher emission intensities abroad (particularly in less developed countries) and (b) Austria importing different goods than those which are produced domestically.

Across products and sectors, the – in absolute terms – highest consumption based emissions in Austria arise for construction, public services, and transport related sectors as manufacturing of motor vehicles and parts. These are very different sectors than the most emission generating activities from a production based perspective, where electricity is the most important sector. Moreover, sectors and products differ also substantially in their emission contribution across the world: while electronic equipment or motor vehicles causes emissions mostly outside the European Union (67% resp. 52% of their total consumption based emissions), construction contributes mostly to emissions in the European Union (67% of their total emissions) and to a lesser degree elsewhere. One reason for this different contribution is how easy commodities and products can be transported across long distances at low costs and how deeply nested the supply chain is.

For climate policy in a fragmented world, the question therefore arises how effective domestic, or European policy can be. European wide policy is needed to address GHG emissions caused by Austrian consumption in Europe. This is particularly important since more than half of Austrian imports originate in their last production stage from Europe. The most comprehensive effort in that respect is the EU Emissions Trading Scheme, addressing emissions in energy intensive industries. But this needs to be further developed, and additional policies are needed for the remaining sectors, in particular transport. There is also a need for policy instruments which have been successful in other areas (such as labor standards), but have not been used sufficiently in climate policy yet. One such instrument is standardization, e.g. for electric charging stations.

For emissions caused outside of the European Union, a mostly academic discussion on carbon tariffs for carbon intensive products (or border carbon adjustment when combined with export rebates) has evolved. But given the recent development particularly in China where coal has been reduced substantially and renewable energy (mostly solar) increased, there also seems to be less need for such carbon tariffs. On the contrary, collaboration in technology development and (international) penetration could be much more effective in achieving ambitious mitigation targets.

Taking into account sectoral consumption based emissions, climate policies within Austria can be designed to address also the emissions originating outside of Austria and the European Union. Focusing on the sectors of

high absolute consumption based emissions in Austria, the introduction of a carbon tax on the consumption based emissions content (e.g. for construction materials) shows a large potential for reducing emissions within and outside the EU. This potential is similarly given when considering carbon requirements in national health procurement and public procurement in general (best offer vs. cheapest offer). Further, domestic policies for increasing energy efficiency and reducing fossil fuel use in domestic activities (such as environmental friendly commuting programs) are equally effective from a domestic production based as from a global consumption based perspective (Nabernegg et al. 2018).

In terms of cost-effectiveness, regulatory instruments like an information obligation on vacant dwellings do well. Extending the criteria of policy evaluation also to feasibility and flexibility, information-based and voluntary instruments perform best, such as a certification scheme for online retailers offering a sustainable delivery option or voluntary commitment by hospitals to reduce food waste in the form of a label or other certification scheme (Kammerlander et al. 2018a).

In general the reduction of emissions caused by Austrian consumption along the global supply chain needs to acknowledge technological developments and aspects of human behavioral change to identify reduction potentials and possible lower effectiveness due to rebound effects. Policy development therefore can be informed by social practice theory, that considers human behaviour as largely habitual, consisting of routines and practices that are performed unconsciously and shaped by infrastructure, social norms and knowledge (Kammerlander et al. 2018b), and policy accordingly addressing these explicitly.

Project team

The project team comprises of researchers from the Wegener Center for Climate and Global Change (University of Graz, project lead), the Sustainable Europe Research Institute (SERI) and the Environment Agency Austria (Umweltbundesamt GmbH). International project partners are from Bonn, Oslo and Manchester.

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