

## Carbon Footprints at the Regional Level and Why They Matter

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Author: Tobias Heinrich Kronenberg

Co-Authors: Johannes TÄ–BBEN

Carbon footprints have become an important tool in sustainability science. They can be used to communicate the relationships between the final demand for goods and the carbon emissions that are associated with that demand along the supply chain. With the help of carbon footprints, we can shed more light on the environmental consequences of economic decisions by households and firms. At the national level, carbon footprints can contribute to the design of better policies that can make societies and economies more sustainable (or at least less unsustainable).

Carbon footprints are calculated on the basis of input-output tables and satellite accounts that reflect the amount of carbon emissions by industries. In most cases the data is available at the country level – either from national statistical offices or from MRIO databases such as WIOD or EXIOPOL. This methodology relies on national averages. Hence, it cannot account for differences in consumption patterns or production techniques within countries. For many applications, the use of country-level data may be appropriate. However, in some cases the difference between regional and national economic structures can be significant. We illustrate this issue with the case of North Rhine-Westphalia, a NUTS1 region in Western Germany.

As one of the 16 German LÄ–nder, NRW has its own regional government and parliament (Landtag). Consequently, it has its own climate policy and sustainability strategy. The regional sustainability strategies of the LÄ–nder are not always in line with the national sustainability strategy of Germany. For example, the national sustainability strategy wants to reduce greenhouse gas (GHG) emissions by 40% between 1990 and 2020. NRW, by contrast, has a target of 25%. Moreover, policy measures that contribute to sustainability at the national level may have adverse effects in certain regions. Currently, for example, Germany is debating a phase-out of coal energy. This measure would clearly bring down national GHG emissions, but it would have serious consequences for employment in the regions with (currently) active coal mines, NRW being one of them.

When regional governments design their sustainability strategies, they should be able to assess the overall effects of their policies. These effects do not stop at regional administrative borders. The economy of NRW is closely intertwined with the rest of Germany and of course with the rest of the world. Hence, regional sustainability strategies may trigger spillover effects in other regions.

The goal of our paper is to contribute to the study of these spillover effects. We use the global MRIO table from the WIOD (with 44 regions/countries) and divide Germany into two regions: NRW and the rest of the country (ROC). As a result, we obtain an extended MRIO table with 45 regions/countries. The extended MRIO makes it possible to compute carbon footprints for NRW and ROC individually. At present, we are still in the final stages of constructing the extended MRIO table. At the workshop we plan to present preliminary results that illustrate the differences between the carbon footprints of NRW and Germany as a whole.