Carbon accounting for households – a case study of a community's emissions

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The aim of this study is to undertake a comprehensive consumption-based supply-chain assessment of a community's emissions, based on their expenditure data. To this end, we use a comprehensive virtual laboratory platform for constructing a customised MRIO database, specific to the case study of interest, using a wide-array of statistical data sources, including the Household Expenditure Survey. We then use the detailed sub-national regional MRIO table of Australia for assessing the consumption patterns of households in a local council area to undertake a supply chain carbon footprint assessment of the community's emissions.

We compare the per-capita CO_2e footprints of the Council region with other Australian states, and note that regions with comparatively small populations – such the Inner West Council, the Northern Territory, or the Australian Capital Territory – fluctuate more than those for larger regions or the nation. Furthermore, we undertake production layer decomposition (PLD) by emitting-industries and purchased-communities. We find that emissions from agriculture and mining only become important at layer 3 and above in the emitting-industry breakdown, and that they are not represented in the purchased-commodity breakdown. This is because households do not buy a significant amount of food directly off farms, and nothing off mines. However, in a supply-chain sense, agriculture and mining sit behind virtually every product. Therefore, we find that these two sectors have very different importance in the two PLD breakdowns. Second, and vice versa, business, personal and public services do not appear to be significant in the emitting-industry breakdown, but in the purchased-commodity breakdown, where they become significant only at layer 5 and beyond. This is because, whilst, households buy a significant amount of services, these are not emissions-intensive. We reveal many such relationships in this study.