Carbon footprint of cities based on micro-consumption data

Topic: Consumption-based accounting (Chair: Bart Los, University of Groningen)
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Given that national pledges are likely insufficient to meet Paris greenhouse gas (GHG) reduction targets, increasingly actors at the city and state level are looking for options on how local government can contribute to reducing GHG emissions. For a typical city only one third to half of their carbon footprint (CF) is emitted within the jurisdiction, while the majority is embodied in goods and services flowing into the city. To support well-informed mitigation efforts, administrators need robust inventories of both direct emissions as well as the supply chain emissions. Here we construct household CF inventories for cities in Japan, India, the European Union (EU), and Indonesia using detailed consumer expenditure data from hundreds of thousands of households and a multi-regional input-output (MRIO) model. Our city-level CF database includes 1172 cities in Japan, 623 cities in India, 76 cities in the EU, and 514 cities in Indonesia (see https://city.spatialfootprint.com/). We identify the consumption activities (food, electricity, gas, other energy, medical care, public transport, education, consumable goods, durables goods, other services) which city policymakers can target to reduce CF. Understanding a city's consumption-based CF of households in addition to its direct emissions exposes additional policy options for each citizen to contribute to achieving national goals.