



## How to Ask Rich and Poor Alike to Pay Fair Shares for Reducing Carbon Emissions

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The reduction of carbon emissions is a key goal for policymakers and advocates concerned about climate change and the overall livability of the environment. Carbon emissions are calculated by measuring how much carbon dioxide (CO<sub>2</sub>) is released into the atmosphere by all the activities involved in the production, sale, and consumption of goods and services. Two main types of measures examine *production-based emissions* directly created by industrial and energy facilities and the *consumption-based emissions* that result indirectly from transportation, residential, and commercial activities.

Research conducted by my colleagues and I finds a paradoxical pattern. As affluent communities reduce their *production-based* carbon emissions through investments in more expensive and efficient technologies, they also tend to increase their *consumption-based* emissions. In the process, wealthier communities may displace carbon-intensive activities onto poorer communities that end up with higher emissions from industrial facilities and energy production. This pattern has important implications for policymakers at the state and local level who aim to reduce carbon emissions and protect the environment for all their constituents.

To ensure that the poorest communities are not further disadvantaged by new environmental policies, policymakers, advocates, and other civil leaders must give special attention to where information about carbon emissions is collected and how accurately it portrays the contributions of different communities. Without knowing such details, policymakers can find themselves supporting new environmental measures that saddle the poorest communities with the highest economic burdens and reductions in health and quality of life. Based on our research, I recommend that policymakers integrate place-specific information into their environmental policymaking and communications to the public.

### Measuring Carbon Emissions

Put simply, there are two types of carbon emissions inventories that should be considered when planning, implementing, and assessing environmental policies:

- **Direct emissions inventories** catalogue the amount of CO<sub>2</sub> and other pollutants in an area by *directly* measuring emissions, for example, from the smokestack of an industrial facility
- **Indirect emissions inventories** catalogue the amount of CO<sub>2</sub> produced by activities that do not themselves produce CO<sub>2</sub> but require the production of such emissions before or after the activity. For example, when a person eats they do not emit significant amounts of carbon dioxide, but depending on what is consumed and how much, significant carbon emissions may have been generated during food cultivation and transportation. The same is true of most consumer products. Inventories of such emissions are often created by indexing what different consumers buy and how much carbon is emitted for various products.

Both types of inventories must be used to understand the effects of environmental policies and avoid unintended and counterproductive consequences. For example, a regional transportation policy might lower direct emissions by reducing the number of cars on the road; but that same policy could simultaneously raise overall carbon emissions by increasing the indirect emissions people in the community produce at home or in order to buy and consume products and services.

When all sorts of emissions are considered, unintuitive outcomes often occur. For example, analysts often argue that dense urban areas produce lower carbon emissions per capita, but a household survey found that, in the 50 largest U.S. metropolitan areas, suburban sprawl and consumption habits in the suburbs actually

negate the positive effects of urban core density on lowering carbon emissions. Without the survey and its measures of indirect carbon emissions, analysts might have falsely assumed, using only direct measures, that metropolitan areas help reduce overall carbon emissions in particular states.

Furthermore, indirect carbon inventories can help tie carbon emissions to the point of consumption more directly. For example, “carbon labels” that provide information on the carbon footprint of household goods can shift consumer demand toward goods that involved lower carbon emissions in their production, transportation, and consumption. Policymakers could reduce their communities’ carbon footprint by support the creation of accurate indirect emissions inventories and making the resulting information widely available to consumers. They can mandate accurate labeling on some products, especially for carbon-intensive goods and services. Given that many such goods and services are very expensive, this approach could allow policymakers to reduce the carbon footprints of the very communities, often America’s wealthiest communities, responsible for generating the highest levels of carbon emissions.

## **Affluence, Location, and Policies to Reduce Carbon Emissions**

Policymakers already use measures of affluence to understand how production-based and consumption-based carbon emissions vary at the national and county levels. But they need more detailed information about how affluence indirectly shapes locally varied carbon emissions.

Affluent people, research shows, can “vote with their feet” – move away – if pollution from industry or energy production makes their neighborhood less desirable. But residents of less affluent communities are often trapped and forced to face conditions that harm health and quality of life. To avoid creating extra burdens on poor areas by crediting them with more carbon loads than they actually produce, policymakers can include indirect emissions in carbon inventories, adding to the accounts of affluent communities the emissions they displace onto lower-income communities where energy, goods, and services are often produced.

To be fully useful, both direct and indirect carbon inventories need high levels of geographic specificity. Direct measures can help tailor policies to specific geographic regions or localities with carbon intensive industries or plants, while indirect measures allow policies and programs to target communities that consume many carbon-intensive goods and services. Overall, carbon mitigation policies must be designed in ways that ensure that communities with larger direct plus indirect footprints bear the larger burdens of any increased prices.

**Read more in Andrew Pattison, Robert Habans, and Matthew Thomas Clement “Ecological Modernization or Aristocratic Conservation: Examining the Impact of Affluence on Carbon Emissions at the Local Level” *Society and Natural Resources*, 27, no. 8 (2014): 850-866; and Matthew Thomas Clement, Andrew Pattison, and Robert Habans “Scaling down the ‘Netherlands Fallacy’: A Local-level Quantitative Study of the Effect of Affluence on the Carbon Footprint across the United States” *Environmental Science & Policy*, 78 (2017): 1-8.**