

Global and Distributional Aspects of American Household Carbon Footprint

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Background

Despite advances in both fields, little research has attempted to connect the literatures of household environmental impact and international trade to explore the global environmental impacts associated with household consumption of goods and services. This connection is important because current international efforts at controlling climate change focus at a national level, and one obvious way to lower national emissions is to displace carbon-intensive production. Further, many studies of household energy requirements (HER) or environmental impact (HEI) have focused on 'average' households within a region and thus miss the tremendous variation in HER/HEI between households of different sizes, incomes, and expenditure patterns.

This research builds on previous analyses of HER and HEI to more clearly link consumption by different American household types to their global household carbon footprint (HCF), one important aspect of environmental impact. Recent activity at the state and national levels shows the potential for future American action on climate change, and understanding the overall role of household consumption in US CO₂ emissions, the distribution of household responsibility, and how international trade shapes US HCF will be vital in designing appropriate and effective policies.

Statement Of Work

We find that due to recently increased international trade, 30% of total US household CO₂ impact in 2004 occurred outside the US. Further, households vary considerably in their CO₂ responsibilities: at least a factor of ten difference exists between low and high-impact households, with total household income and expenditure being the best predictors of

both domestic and international portions of the total CO₂ impact. Household size is another important explanatory factor, which can be seen as either increasing a household's total carbon footprint or decreasing per capita household footprint due to increased burden sharing.

Significance

The global location of emissions, which cannot be calculated using standard input-output analysis, and the variation of household impacts with income, have important ramifications for policies designed to lower consumer impacts on climate change, such as carbon taxes or cap and trade schemes. The effectiveness and fairness of such policies hinges on a proper understanding of how income distributions, rebound effects, and international trade affect them. Since such a high proportion of US HCF lies in foreign countries, if no additional effort is made to also control imports, such as carbon border tax adjustments, a significant portion of the US's total climate impact would be missed.

For more information:

Weber, C., and Matthews, H. S. (2007). "Embodied Emissions in U.S. International Trade: 1997-2004." *Environmental Science & Technology*, 41 (14), 4875 -4881, 2007.

Weber, C.L. and Matthews, H.S. (2007) "Quantifying the Global and Distributional Aspects of American Household Environmental Impact" *Ecological Economics*, In Press.

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