

Free green services could substantially reduce emissions

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Using carbon tax revenue to fund free green electricity and public transport could significantly reduce individual households' greenhouse gas emissions, a new study has found.

The paper, published today by the University of Leeds, reveals that providing these services for free could reduce home energy emissions by 13.4%, and [motor fuel](#) emissions by 23.8%.

Carbon taxes on home energy and motor [fuel](#) often place a greater burden on [low-income households](#) because the same tax rate applies to every taxpayer, regardless of income. However, they contribute much less to climate change than high income households.

The researchers compared two ways of using revenue from carbon taxes to reduce emissions and fuel and [transport](#) poverty. They found that providing free green services would be more effective than redistributing the tax revenue among the population to address the regressive impacts of the taxes on lower earners.

The study was led by Dr. Milena Buchs, Associate Professor in Sustainability, Economics and Low Carbon Transitions in Leeds' Sustainability Research Institute. She said: "Stringent climate policies, including carbon taxes on home energy and motor fuels, are likely to be part of government strategies to achieve climate targets, but they put higher burdens on low-income households than on rich households. Governments urgently need to make climate policies fairer by finding ways that can compensate disadvantaged people.

"Providing people with green living options, like free green electricity and free [public transport](#), is promising because it's re-distributive, saves emissions and reduces fuel and transport poverty."

The research team examined household expenditure data on home energy and motor fuel from 275,614 households across 27 European countries, provided by the European Household Budget Surveys (HBS). The expenditure data were combined with emission factors to estimate annual [greenhouse gas emissions](#) per household for home energy and

motor fuels.

They then examined the impact of introducing two different compensation strategies to mitigate the impact of new carbon taxes on low-income households.

They found that giving cash back through tax rebates, without bringing in additional low carbon investments such as [renewable electricity](#) or public transport, would result in only small reductions in home energy and motor fuel emissions.

In contrast, introducing universal green vouchers with expanded renewable electricity generation and public transport would reduce home [energy emissions](#) by 13.4%, and motor fuel emissions by 23.8%.

If green vouchers and infrastructure were provided without introducing carbon taxes, [emission](#) savings would be slightly lower, but 4.1% and 2.2% of households would be lifted out of fuel and transport poverty respectively.

However, combining carbon taxes with cash compensation would increase fuel and transport poverty by 4.1% and 1.8%.

Dr. Buchs said: "These findings demonstrate that policies that aim to compensate for unfair distributional impacts of [carbon](#) taxes need to be combined with additional environmental interventions.

"The provision of green goods and services needs to be expanded, and fuel and transport poverty minimized, so that social and environmental objectives can both be met."

"Fairness, effectiveness, and needs satisfaction: new options for designing climate policies" is published in *Environmental Research*

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More information: Fairness, effectiveness, and needs satisfaction: new options for designing climate policies, *Environmental Research Letters* (2021). [DOI: 10.1088/1748-9326/ac2cb1](https://doi.org/10.1088/1748-9326/ac2cb1)

Provided by University of Leeds

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