

Fuel price increases and green vehicle incentives: The best climate policy for road transport

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A quarter of global greenhouse gas emissions are generated in the transport sector, and climate policy has not been very successful so far in

tackling these, especially those from road transport. And yet a few international examples of significant reductions in road emissions in a stable economic situation have been found. A new study now sheds light on how such success stories arose and what recommendations and opportunities for future policy can be derived from them. It was conducted by the Berlin-based climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change) in cooperation with University of Oxford and University of Victoria.

The study is published in the journal *Nature Energy*. It takes an innovative approach to policy evaluation. Classic impact analysis is geared toward evaluating individual measures in isolation—but in political reality, governments almost always implement bundles of measures that impact each other. To address this, a new data-driven approach to identify effective policy mixes has been developed. The research team looks at road emissions from 1995 to 2018 in 15 countries (EU before eastward enlargements, including the U.K.), matches them with [economic performance](#) and population, and uses machine learning methods to identify "emissions breaks" that do not result from economic conditions. Finally, it determines which individual or interacting [climate policy](#) measures have generated these emissions breaks.

The sophisticated statistical method thus identifies promising combinations from the multitude of possible policy instruments. "We found only ten examples of successful climate policy intervention in [road transport](#) in 15 EU countries over a period of 24 years," reports Nicolas Koch, head of the Policy Evaluation Lab at MCC, and lead author of the study. "All ten cases are linked to at least one measure that increased the running costs of driving—usually via higher fuel prices through carbon pricing, but sometimes through energy taxes, or tolls. In addition, in almost all cases, the policy provided incentives to buy zero- or lower-emission vehicles—either through vehicle taxes based on CO₂ emissions, or through subsidies."

The magnitude of the ten identified emission reductions indicates the significant potential of certain policy mixes in transport, even if more success is needed to reduce overall CO₂ emissions further. The largest relative reduction was in Luxembourg, where the government was able to reduce emissions by 26% from 2015 through a combination of higher fuel prices and bonus-malus schemes for vehicle purchases. This was followed by Finland (by 17% from 2000), Ireland (by 13% from 2011), and Sweden (by 11% from 2001); Denmark and Portugal likewise recorded successes with this combination. In Germany, the eco-tax reform from 1999 to 2003 and the road tolls for trucks from 2005 had a positive climate impact.

Looking to the future, the research team recommends increasing carbon pricing in road transport, flanked by an ambitious bonus-malus system: moderate subsidies for [electric vehicles](#) and widely spread vehicle tax rates for combustion cars. "In principle, the leverage effect of such a policy mix should be strong enough to achieve the EU's proclaimed goal of climate neutrality by the middle of the century, even in this so far challenging sector," concludes MCC researcher Koch. "The instruments are available. What is needed now is the political will to apply them consistently, comprehensively, and over the long term."

More information: Nicolas Koch et al, Attributing agnostically detected large reductions in road CO₂ emissions to policy mixes, *Nature Energy* (2022). [DOI: 10.1038/s41560-022-01095-6](https://doi.org/10.1038/s41560-022-01095-6)

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