

# PUTTING A PRICE ON VEHICLE EMISSIONS IS BETTER POLICY THAN IT SEEMS

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AUGUST 2018

The [recently proposed legislation](#) to establish a tax on carbon dioxide emissions by Representative Curbelo marks the first time in nearly a decade congressional Republicans have put forward a plan that would significantly reduce greenhouse gas emissions. For supporters of robust and cost-effective climate change policy, this is a big deal. [Analysis of the proposal](#) by analysts at Columbia University, Rhodium Group and Rice University shows the legislation would significantly reduce U.S. greenhouse gas emissions and would allocate sufficient revenues to low-income families to offset the price increases caused by the tax. The analysis also finds the policy would have near-zero effects on economic growth and gasoline prices at the pump. The latter result may be surprising to those familiar with carbon tax policies, so it is worth exploring in more detail.

While the Curbelo Proposal is similar in many respects to other carbon tax proposals, it is unique in abolishing the federal excise tax on gasoline. Such a move would decrease gasoline prices by more than [18 cents/gallon](#). At the same time, the proposal's carbon tax would start at \$24/ton in 2020, which would increase the price of gasoline [about 20 cents/gallon](#). Combined, the addition of the carbon tax and subtraction of the excise tax would have the effect of almost entirely exempting vehicle fuels from any tax increases in the early years of the policy. Such an exemption would offer obvious political advantages for policymakers seeking a market-based approach to address climate change. Drivers clearly prefer lower gasoline prices and critics always point to higher prices at the pump as a major drawback for any carbon tax.

Moreover, projections from the country's most widely used energy models suggest that a carbon tax would have only minuscule effects on the behavior of drivers. In theory, by raising the price of gasoline and thus the cost of operating a vehicle, a carbon tax encourages the purchase and use of alternatives to gasoline-powered vehicles, like electric vehicles, hybrids, or public transportation. However, according to [a recent analysis](#) from the Rhodium Group using its version of the NEMS model developed by the U.S. Energy Information Administration, even a \$50 per ton carbon tax (over two times larger than the Curbelo proposal) would reduce gasoline consumption by just one to three percent over the first five years. [A comparable analysis](#) from the energy model used by the U.S. Environmental Protection Agency shows nearly identical results.



Why do these models predict that in the face of a carbon tax, consumers will overwhelmingly shrug and continue with their driving habits? Because that's what drivers have done in the past when faced with comparable price changes. Gasoline price fluctuations of 20 to 40 cents per gallon are well within the bounds of [recent historical variation](#), and these price changes would not represent a significant fraction of the costs of operating a vehicle. Furthermore, consumers make decisions about what cars and trucks to purchase primarily based on sticker prices, and low-carbon alternatives to gasoline-powered vehicles have historically been relatively expensive.

As such, it could be inferred that repealing the gas tax and implementing a comparably stringent carbon tax would avoid increasing prices at the pump without sacrificing almost any emissions reductions. However, evidence from real-world policies tells a different story and suggests that by doing so, the Curbelo proposal may be leaving significant emissions reductions on the table.

Although few places have put strong carbon taxes on vehicle emissions, in those that have implemented such a tax, an emerging body of evidence suggests that the behavior of drivers has shifted far more than expected. In British Columbia, [a detailed econometric study](#) found that reactions to the carbon tax have been at least three times larger than the response to equivalent changes in gasoline prices, even controlling for factors like improvements in public transportation and cross-border shopping in Washington state. The reduction in gasoline use was most significant in the densely populated Vancouver area, where consumers have shorter commutes and can use public transportation instead of private vehicles. Similarly, [a study in Sweden](#) estimated the response to adjustments in the carbon tax rate and other changes to gasoline prices (excluding the carbon tax) and found that response to changes in the carbon taxes were three times larger.

While it is true that [Americans tend to be exceptionally unresponsive](#) to changes in gasoline prices, they are not immune to larger responses when the price changes are due to increasing taxes. A comprehensive study that used data on gasoline consumption, gasoline prices, and US state and federal gasoline taxes from 1966 to 2008 [found](#) that responses to changes in gasoline taxes are at least three times as large as responses to changes in gasoline prices.

The consistency of these results is admittedly strange, but the finding that we react more to price changes caused by policy than to normal day-to-day price fluctuations is not surprising at all. Policy changes are more permanent than typical price fluctuations. Drivers may not pay attention to small changes in prices at the pump, but new policies create price changes that are more noticeable because they are often well publicized and involve “shocks” rather than gradual price changes.

So, the effect of a carbon tax on vehicle emissions may be more substantial than conventional wisdom suggests. Using the same Rhodium Group study, if consumer responses to a carbon tax are indeed three times larger than to day-to-day price changes, the \$50 per ton carbon tax will cause gasoline consumption to fall 8 or 9 percent after five years, avoiding nearly 100 million tons of carbon dioxide per year by 2025. Although this is still a small percentage of US emissions, it is far from the rounding error implied by energy model projections



There is little to suspect this phenomenon is limited to gasoline consumption. For example, energy models also project that a carbon tax would cause near-zero changes in the use of diesel fuel (which would also be subject to no federal excise tax under the Curbelo proposal). If the response of real-world consumers of diesel fuel to carbon tax-induced price changes is significantly greater than to day-to-day price changes, then a strong price on the emissions of these fuels may contribute significant emissions reductions as well.

With a longer-term outlook, the case for putting a substantial carbon price on vehicle emissions (and thus the case against repealing the fuel excise taxes) becomes even more compelling. The decarbonization of the US energy system will not occur without addressing transportation sector emissions, [the country's #1 emissions source](#). Given the Trump administration's [call to roll back vehicle GHG standards](#), a federal policy strategy for vehicle emissions is non-existent.

For sure, a carbon price by itself will not rapidly decarbonize the transportation sector, but it is an important component of a cost-effective strategy for addressing vehicle emissions. The promise of high future carbon prices on vehicle emissions [would spur private sector investments](#) in clean vehicles technologies and infrastructure, a key driver of innovation and emissions reductions in the long-run. As low carbon transportation alternatives continue to improve and become more viable substitutes to gasoline-powered vehicles, more consumers will change their behavior due to the price changes caused by the carbon tax. Already, for example, lithium ion battery costs for electric vehicles have fallen [almost 80 percent](#) since 2010, and are [expected to fall much further](#).

None of this implies the Curbelo proposal is bad policy because it goes easy on drivers. With a federal carbon price of zero across all sectors, the status quo is a significant public policy failure, and avoiding price increases at the pump may be a politically savvy way to achieve a major improvement. However, a carbon tax layered on top of the current gasoline tax may achieve larger emissions reductions than we once thought.

## ABOUT THE AUTHOR

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The views represented in this commentary represent those of the author. Thanks to John Larsen, Marianne Kah and Matthew Robinson for comments on earlier drafts.

This work was made possible by support from the Center on Global Energy Policy. More information is available at <http://energypolicy.columbia.edu/about/mission>.

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