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POLICY BRIEF 2017-02

The Next Generation of Transportation Policy

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The Next Generation of Transportation Policy

The existing system of fuel efficiency standards is incomplete in several respects. Changes in fuel economy standards affect only new vehicles, leaving the existing fleet unaffected. Even among new vehicles, gains in fuel efficiency have stalled in recent years as consumers increase their purchases of sport utility vehicles (SUVs) and pickup trucks, which are regulated differently. Because current standards regulate new vehicle fuel efficiency rather than total emissions, they cannot ensure continued progress in reducing emissions. Without a well-functioning market for trading emissions permits, potential gains from trade across vehicle manufacturers (and across sectors) are neglected.

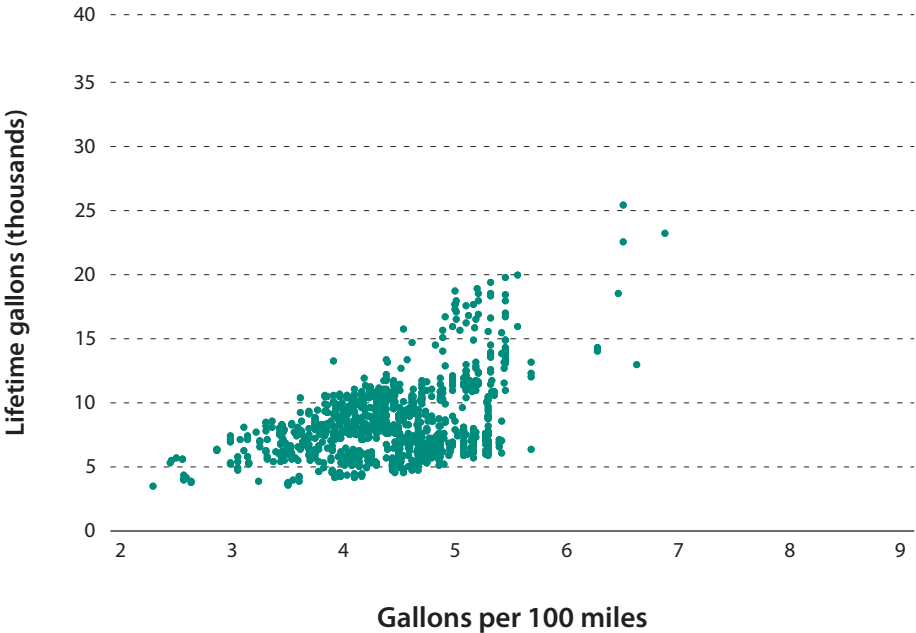
A new proposal by Michael Greenstone, Cass Sunstein, and Sam Ori takes two major steps to address the structural challenges in current fuel economy standards. First, regulations would target the vehicle’s total greenhouse gas

(GHG) emissions directly, without differentiating by vehicle types and sizes, using data to project a given vehicle’s lifetime greenhouse gas emissions. Second, the establishment of a robust cap-and-trade market would reduce compliance costs for automakers while providing considerably more certainty about the future path of carbon dioxide (CO₂) emissions.

The Challenge

Fuel efficiency regulations—originally implemented as the Corporate Average Fuel Economy (CAFE) standards—have increased fuel efficiency. Despite the progress achieved so far, the transportation sector has surpassed electric power to become the largest source of energy-related CO₂ emissions in the United States. Greenstone, Sunstein, and Ori discuss several aspects of current fuel economy regulation that make it

FIGURE 1. Variation in Lifetime Fuel Consumption by Vehicle Efficiency, Cars



Source: Jacobsen et al. 2016.

difficult to achieve further reductions efficiently, including the program's focus on fuel efficiency rather than total emissions, structural loopholes that prevent reductions, and imperfect permit trading.

Program Focus on Efficiency Rather than Emissions

The current program regulates fuel efficiency, measured by either the number of miles a vehicle can travel per gallon of gasoline or the grams of CO₂ emitted per mile. This approach has important limitations. It assumes that all vehicles travel the same number of miles over their lifetimes, which recent research shows to be inaccurate, as demonstrated in Figure 1. By targeting fuel efficiency, existing regulations impose the same costs on vehicles that have large differences in lifetime CO₂ emissions.

Structural Loopholes

The authors explain that several provisions in fuel efficiency standards create difficulties for achieving emissions reductions.

Credits and bonuses

Some credits and bonuses help automakers comply with regulations without actually improving fuel economy. For example, automakers can take advantage of bonus credits for flex-fuel vehicles (FFVs) that can use non-petroleum fuels such as ethanol. In practice, however, because consumers often use gasoline instead of ethanol, the vehicles do not confer significant benefits in actual fuel efficiency. The authors explain that automakers have extensively utilized these bonuses, with 7 percent of the U.S. light-duty fleet now consisting of FFVs. Incentives that are not tied to real fuel efficiency improvements create inefficient loopholes and impair progress in achieving emissions reductions.

Dual treatment for cars and light trucks

Automakers also face weaker regulations for light trucks than for cars, which means that the heaviest polluters are regulated less stringently. Regulating passenger cars more stringently than light trucks decreases the relative price of light trucks and increases their market share. This separate treatment under the program works against its broader fuel efficiency goals.

Footprint-based standards

An additional loophole in fuel efficiency standards is the differential treatment by the so-called footprint. A vehicle footprint is defined as the area of the rectangle formed by the four points where a vehicle's wheels touch the ground. Analogous to the dual treatment for cars and light trucks, larger vehicles face less-stringent requirements than vehicles with smaller footprints. This disparity encourages production of larger vehicles that emit more GHGs. For instance, the authors note that the share of vehicles that are light trucks is currently much higher than was projected in 2009, contributing to a 2016 deficit in average fuel economy of 1.5 miles per gallon relative to expectations.

Weak Trading Program

The authors point out that current fuel efficiency regulations include a trading program that can, in principle, reduce compliance costs for automakers. Manufacturers can earn credits to trade or bank for future use if they exceed their fuel efficiency target for a given model year. This choice is intended to improve flexibility by allowing automakers with the best ability to meet and exceed the requirements to generate and sell credits, while allowing automakers with high marginal costs of increased fuel efficiency to buy the credits.

In practice, however, it is difficult for automakers to utilize these credits. There are two separate trading regimes provided by the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration. These systems are not fully harmonized, generating complexity that undermines the potential benefits of the trading program. Rule differences across the two trading regimes increase trading costs, while firms with large market shares hold most of the credits and can exercise market power by refusing to sell credits. These problems have generally limited trade volume in the EPA trading regime to less than 1 percent of earned credits.

A New Approach

To address the challenges in the current fuel efficiency standards, Greenstone, Sunstein, and Ori propose a three-pronged approach. First, they suggest that regulations be reworked to focus on expected emissions directly, without differentiation by vehicle type and size. Second, they propose requiring that vehicles' lifetime miles traveled—and consequently lifetime emissions—be estimated and targeted. Finally, the current credit trading market would be improved to enhance the benefits of its use. These reforms would be implemented in 2025, when the current fuel efficiency standards expire.

Regulate Expected Emissions Directly

Currently, regulations allow vehicles like light trucks and those with large footprints to follow less-stringent standards.

Eliminate the separate treatment of cars and light trucks.

The authors propose removing the separate treatment of cars and light trucks. This would better target climate policy goals by eliminating the less-stringent treatment of light trucks. It would also prevent shifts in the mix of new vehicles from offsetting progress in the achievement of emissions reductions.

Eliminate size categories.

Under their proposal, the program would not consider a vehicle's footprint in determining its emissions standards. This would further improve the regulatory focus on emissions, eliminating inefficient special treatment for larger vehicles.

Estimate and Target a Vehicle's Lifetime Emissions

The current program targets vehicle fuel consumption per mile traveled, but ignores differences in lifetime vehicle use. Under the authors' proposal, lifetime fuel emissions would be estimated for each vehicle model using vehicle retirement data. Automakers would be required to have permits sufficient to cover total lifetime emissions of vehicles sold. This would refocus regulations on lifetime emissions—which are the most relevant variable for climate policy.

Develop a Robust Cap-and-Trade Market

The existing credit trading regime would be improved by constructing a cap-and-trade system similar to the Acid Rain Program that minimizes sulfur dioxide emissions from power plants. Under the authors' proposal, an industry-wide cap on lifetime vehicle emissions would be set for vehicles sold in the United States, and all automakers would be required to hold tradable permits for the lifetime emissions of their vehicles. This simpler, more-comprehensive system would not differentiate vehicles by size and type—only by projected lifetime emissions. Automakers that face relatively higher costs in reducing emissions would be able to purchase permits from automakers that meet emissions regulations more easily, at a price determined by the market for credits. One extension could even allow for firms in the transportation sector to purchase credits from firms in the power sector, which would more efficiently allocate the burden of reducing CO₂ emissions across the economy.

Roadmap

Following the 2025 expiration of the National Program, the Environmental Protection Agency (EPA) will implement the following modifications, which would not require new legislation:

- The EPA will regulate projected vehicle CO₂ emissions without differentiation based on vehicle type (cars versus light trucks) or vehicle footprint.
- Using existing data, the EPA will estimate each vehicle model's lifetime emissions.
- The EPA will develop a robust cap-and-trade market for vehicle lifetime emissions. The cap-and-trade program
 - Sets a national cap on lifetime emissions for vehicles sold in the United States, and
 - Allows firms with lower compliance costs to sell credits to those with higher costs.

Benefits

The authors propose simplifying fuel efficiency standards to refocus the program on achieving guaranteed emissions reductions at lower cost to automakers. By removing dual treatment for cars and light trucks, and by removing unequal treatment by vehicle size while simultaneously focusing directly on lifetime emissions, emissions reductions would be obtained more cheaply and with greater certainty. The proposal would also include a simplified, more-comprehensive cap-and-trade system that would provide greater flexibility to automakers.

Learn More about This Proposal

This policy brief is based on The Hamilton Project policy proposal, “The Next Generation of Transportation Policy,” which was authored by

MICHAEL GREENSTONE
Energy Policy Institute at the University of Chicago

CASS SUNSTEIN
Harvard University

SAM ORI
Energy Policy Institute at the University of Chicago

Conclusion

The CAFE standards for vehicle fuel efficiency have reduced U.S. CO₂ emissions in the past, but progress has stalled. Current standards allow light trucks and larger vehicles to adhere to less-strict standards, which works against the goal of reducing vehicle emissions. Current policy also focuses on fuel consumption per mile traveled rather than lifetime vehicle emissions, and does not guarantee emissions reductions as the vehicle fleet mix changes. The current trading system is poorly developed, making it difficult for automakers to trade credits due to conflicting rules across agencies and varying standards across vehicles.

Greenstone, Sunstein, and Ori propose improvements to fuel efficiency standards that would focus on a vehicle’s lifetime usage along with fuel efficiency, and would eliminate inefficient distinctions based on vehicle size. They also propose setting a guaranteed cap on vehicle emissions and developing a robust cap-and-trade system, thereby reducing emissions as well as compliance costs for automakers.

Questions and Concerns

1. How would this proposal interact with existing state cap-and-trade markets?

Because this proposal would create a more robust market for transportation emissions, it could create an attractive opportunity to link a transportation cap-and-trade system with the CO₂ cap-and-trade programs that California and some East Coast states are already using, and that other states are considering adopting to comply with the Clean Power Plan. This would provide the markets with greater flexibility to identify the lowest-cost emissions abatement opportunities.

2. Why use a cap-and-trade system?

Unlike a standard fuel efficiency policy, a cap-and-trade policy offers a high level of certainty in emissions reductions. Policy makers set a total limit on emissions of a given kind, such as CO₂. Then, permits are distributed or sold to firms. Without sufficient permits, firms cannot generate emissions. Firms must then make decisions about whether to purchase or sell credits, and whether to invest in a given amount of technology or other means for reducing pollution.

The open market in permits keeps firms' costs as low as possible for any given level of total emissions. Because the cost of emissions reduction varies greatly between firms, it is preferable for those firms with a low cost of reducing emissions to do the bulk of the work, and this is indeed what a cap-and-trade market achieves. By contrast, one-size-fits-all, command-and-control policies result in much higher costs than necessary.

Cap and trade is a decentralized, market-based approach to minimizing emissions. It limits government involvement and discretion and compensates those firms that have the lowest cost of reducing emissions.

Highlights

Michael Greenstone, Cass Sunstein, and Sam Ori propose reforms to fuel efficiency standards for U.S. vehicles. Current standards allow light trucks and larger vehicles to emit at higher levels, focus on efficiency without consideration of lifetime vehicle usage, do not guarantee emissions reductions, and do not establish an effective market for trading credits. Greenstone, Sunstein, and Ori's proposal removes considerations of vehicle type and size, refocuses on lifetime vehicle emissions, and establishes a robust cap-and-trade program for vehicle emissions.

The Proposal

Regulate expected CO₂ emissions directly. Standards would be equalized to treat light trucks and larger vehicles with the same level of stringency as they treat other vehicles.

Estimate and target a vehicle's lifetime emissions. Current standards based on fuel efficiency alone would be replaced with expected lifetime emissions, incorporating consideration of vehicle usage.

Develop a robust cap-and-trade market to reduce compliance costs. The EPA would establish a nationwide cap on lifetime vehicle emissions and allow automakers to trade credits more flexibly.

Benefits

This proposal would both improve the likelihood that vehicle emissions regulations achieve desired reductions and lower the cost of compliance for automakers. The reforms would realign fuel efficiency standards to reduce CO₂ emissions across vehicle types.



1775 Massachusetts Ave., NW
Washington, DC 20036

(202) 797-6484

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