



IMPROVING THE FUEL EFFICIENCY OF AMERICAN TRUCKS —

BOLSTERING ENERGY SECURITY,
CUTTING CARBON POLLUTION,
SAVING MONEY AND SUPPORTING
MANUFACTURING INNOVATION

FEBRUARY 2014

I. Leading on Fuel Economy and Efficiency

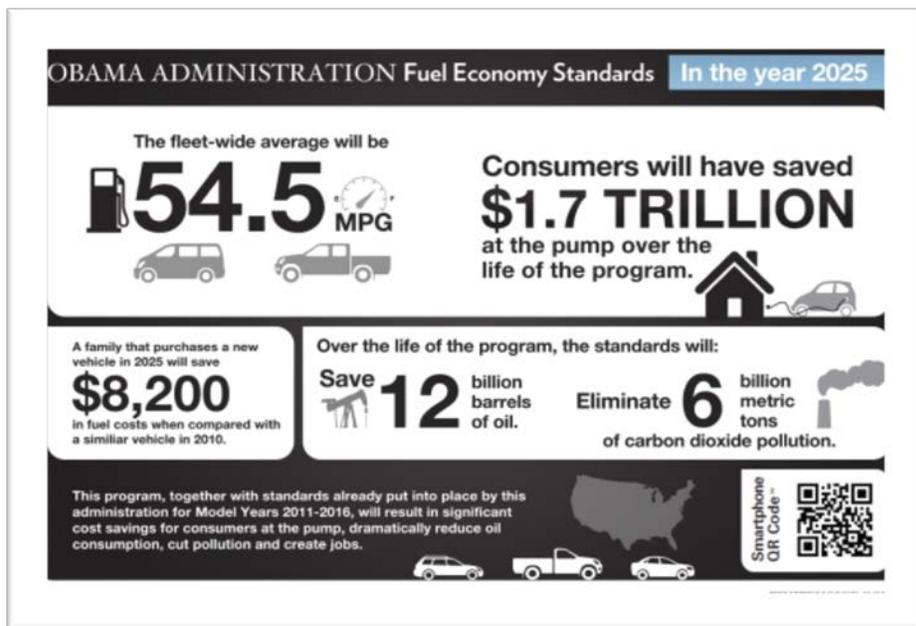
In June 2013, President Obama released his Climate Action Plan, which lays out an all-of-the-above approach to develop homegrown energy, as well as steady, responsible steps to cut carbon pollution so we can protect our kids' health and begin to slow the effects of climate change.

In the Climate Action Plan, the President committed to partnering with industry and stakeholders to develop new fuel efficiency standards for post-2018 medium- and heavy-duty vehicles (both referred to simply as heavy-duty vehicles) to save families money at the pump and further reduce reliance on foreign oil and fuel. Like other components of the Climate Action Plan, this commitment builds on the Administration's work over the last five years to reduce our dependence on foreign oil and save consumers money. More than 70 percent of the oil used in the U.S. is for transportation, and since 2009 the Administration has worked with industry and states to develop ambitious, flexible standards for both the fuel economy of light-duty vehicles and the fuel efficiency of heavy-duty vehicles.

As a result, we are already seeing more efficient cars and trucks rolling off of assembly lines and into garages and freight facilities across the country. Our cars and trucks have never been more efficient, and our petroleum net imports are the lowest since 1991, thanks in part to declining fuel demand for vehicles.

When the President first took office, one of the first actions he took was to direct the Environmental Protection Agency (EPA) and the Department of Transportation (DOT) to work with the auto industry to develop new fuel economy standards for cars and light trucks. This work culminated in President Obama announcing in July of 2011 a national standards to double the efficiency of light-duty cars and trucks by 2025.

Taken together, the Administration's light-duty standards span model years 2011 to 2025 and are the first significant improvement in over three decades. Under the final program, average new car and light truck fuel economy is expected to double, reaching an average greenhouse gas performance equivalent of 54.5 miles per gallon by 2025,¹ saving consumers \$1.7 trillion at the pump—roughly \$8,200 per vehicle for a MY2025 vehicle — reducing oil consumption by 2.2 million barrels a day in 2025, and slashing greenhouse gas emissions by 6 billion metric tons over the lifetime of the vehicles sold during this period.



¹ The projected model year 2025 CO₂ compliance value of 163g/mi would be equivalent to 54.5 mpg, if the entire fleet were to meet this CO₂ level through tailpipe CO₂ and fuel economy improvements. The agencies expect, however, that a portion of these improvements will be made through improvements in air conditioning leakage and through use of alternative refrigerants, which would not contribute to fuel economy. Real-world fuel economy is typically 20 percent lower than the fuel economy equivalent GHG compliance value discussed here.

These fuel economy standards are already delivering savings for American drivers. Between model years 2008 and 2013 the unadjusted average test fuel economy of new passenger cars and light trucks sold in the U.S. has increased by about 4 mpg. Altogether, light-duty vehicle fuel economy standards finalized after 2008 have already saved nearly a billion gallons of fuel and avoided more than 10 million tons of carbon dioxide emissions.

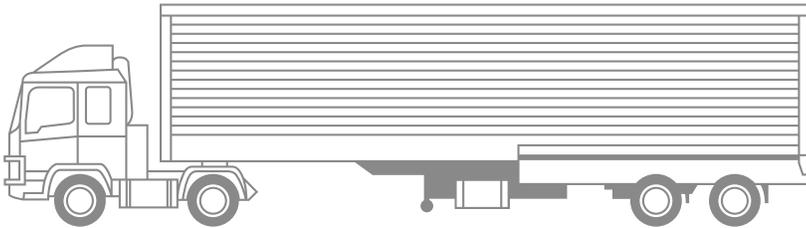
II. First-Ever Fuel Efficiency Standards for Trucks

When President Obama came into office, heavy-duty trucks and buses – from delivery vans to the largest tractor-trailers– were required to meet pollution standards for soot and smog-causing air pollutants, but no requirements existed for the fuel efficiency or carbon pollution of these vehicles. By 2010, total fuel consumption and greenhouse gas emissions from heavy-duty vehicles had been growing, and these vehicles accounted for 23% of total U.S. transportation-related greenhouse gas emissions.

In 2010, President Obama [directed](#) the EPA and the DOT’s National Highway Traffic Safety Administration (NHTSA) to develop joint greenhouse gas and fuel efficiency standards for heavy-duty trucks. The agencies met that directive in August 2011 by finalizing first-of-a-kind standards for new heavy-duty vehicles in model years 2014 through 2018.

Standards for a Diverse Truck and Bus Fleet: To account for the diversity of heavy-duty trucks and buses, the Administration set standards for three categories of vehicles:

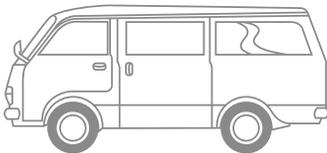
COMBINATION TRACTORS (commonly known as big rigs or semi trucks)



Required to achieve up to approximately 20 percent reduction in fuel consumption and greenhouse gas emissions by model year 2018.

Saving up to 4 gallons of fuel for every 100 miles traveled.

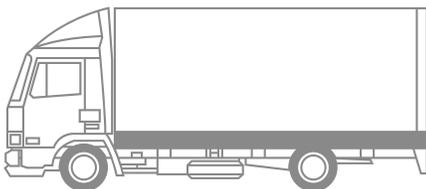
HEAVY-DUTY PICKUP TRUCKS AND VANS



Separate standards are required for gasoline-powered and diesel trucks. These vehicles are required to achieve up to about 15 percent reduction in fuel consumption and greenhouse gas emissions by model year 2018.

Under the finalized standards a typical gasoline or diesel powered heavy-duty pickup truck or van could save one gallon of fuel for every 100 miles traveled.

VOCATIONAL VEHICLES (delivery trucks, buses, and garbage trucks)



Required to reduce fuel consumption and greenhouse gas emissions by approximately 10 percent by model year 2018.

These trucks could save an average of one gallon of fuel for every 100 miles traveled.

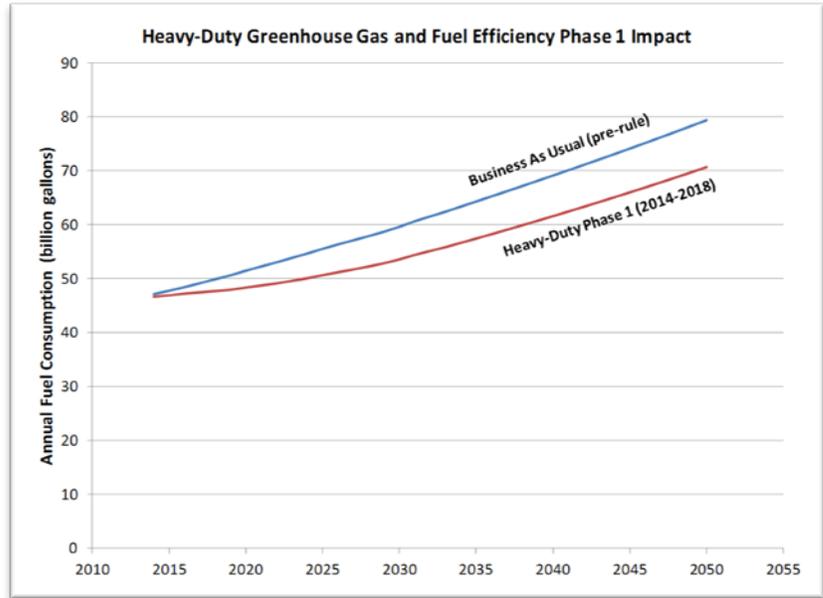
The majority of these trucks carry payloads of goods and equipment, in addition to passengers. To promote real world improvements in fuel efficiency, the heavy-duty standards require manufacturers' combination tractor fleets and vocational vehicle fleets to meet targets for gallons of fuel consumed –and greenhouse gas emissions– per ton-mile, which account for how efficiently the vehicle perform the work they do. A simple mileage-based metric like miles-per-gallon would not account for the work these vehicles do. Manufacturers of pickup truck and van fleets must meet targets that incorporate payload and towing factors.

- **Americans are Saving Today:** American businesses and households are already saving money thanks to the Administration's first round of heavy-duty vehicle standards. Model year 2014 vehicles required to meet new standards have been sold since early 2013, and some manufacturers chose to take advantage of incentives to comply in earlier model years.
- **Fuel Savings Will Continue to Grow throughout the 2014-2018 Program:** By model year 2018, an operator of a new semi truck could pay for the technology upgrades in under a year and realize net savings of \$73,000 through reduced fuel costs over the truck's useful life. Those savings translate into dollars saved by American families, since lower transportation costs can ultimately lower the costs of groceries and other products we purchase. The heavy-duty standards will result in significant savings over the lifetime of vehicles built for model years 2014-2018, including:
 - Saving vehicle owners and operators an estimated \$50 billion in fuel costs.
 - Saving a projected 530 million barrels of oil, or more than the United States imports in a year from Saudi Arabia.
- **Cutting Pollution and Improving Public Health:** The first round of heavy-duty standards will also significantly reduce emissions of greenhouse gases and other air pollutants, helping to improve public health and meet the President's goal of cutting U.S. greenhouse gas emissions in the range of 17 percent below 2005 levels by 2020. Over the lifetime of vehicles built for model years 2014-2018, the first round heavy-duty standards will:
 - Reduce carbon pollution by about 270 million metric tons, or the equivalent of taking 56 million passenger vehicles off the road for a year.
 - Improve air quality by reducing particulate matter and ozone, resulting in health benefits estimated to range from about \$1.3 billion to \$4.2 billion in 2030.



Increasing the efficiency of medium- and heavy-duty vehicles is a key component of the President's Climate Action Plan and a critical step to cut oil use, save money, and improve U.S. energy security. Heavy-duty vehicles contribute disproportionately to greenhouse gas emissions and fuel use. In 2010, heavy-duty vehicles represented just four percent of registered vehicles on the road in the United States, but they accounted for approximately 25 percent of on-road energy use and greenhouse gas emissions. They are currently the second-largest source of greenhouse gas emissions and energy use within the transportation sector after passenger cars and light trucks.

Although the Administration's first round standards have locked in long-lasting gains in fuel efficiency, heavy-duty truck fuel consumption is still projected to grow as more trucks are driven more miles. New standards that extend beyond model year 2018 will further improve energy security, save money for consumers and businesses, reduce harmful air pollution, and lower costs for transporting goods while spurring job growth and innovation in the clean energy technology sector.



III. Supporting Manufacturing Innovation

Medium- and heavy-duty trucks and truck components are produced by a diverse group of manufacturers, including truck-makers engine manufacturers, trailer manufacturers, tire manufacturer, and a large supply chain. Together, they are responsible for the sale of roughly 1,500,000 new vehicles each year, employing workers across the country. The Phase I standards, introduced in 2011, provide a clear signal to manufacturers and suppliers to invest in new materials and technologies to reduce weight and improve vehicle efficiency. These standards support a foundation for continued American leadership in the development and manufacture of advanced engine and trucking technology, and that is why leading engine manufacturers recognized the first-ever standards issued by the Obama Administration as demonstrating worldwide leadership in the development of efficient trucks.

The strength of American trucking technology has supported strong growth in the exports of U.S. manufactured trucks, with the value of exports in 2013 of approximately \$16.4 billion, a 21 percent increase over the pre-recession high of \$13.6 billion in 2007. While the majority of these exports go to Canada, exports to Australia, Mexico, South Africa, Chile, Nigeria and China have all been strong and growing in recent years.

The Administration is taking additional steps to support innovation in this sector, including:

- **Building a Public-Private Partnership to Deploy Advanced Vehicles:** The National Clean Fleets Partnership, launched by President in 2011, aims to speed the deployment of clean, energy-efficient vehicles and the infrastructure to support their widespread use nationwide. This public-private partnership helps the nation's largest fleet operators reduce diesel and gasoline use in their fleets by

incorporating alternative fuels, electric vehicles and fuel-saving measures into their daily operations. Twenty-three major national companies, who collectively operate more than one million vehicles, such as ARAMARK, Coca-Cola, Staples, UPS, AT&T, Enterprise Holdings, and Waste Management have joined the partnership, receiving from the Department of Energy specialized resources, technical expertise and support in developing a comprehensive strategy to reduce fuel use and achieve greater efficiency and cost savings. The Department also helps connect partners with clean fuel providers and equipment manufacturers where their fleets operate. Working with the Administration, the private sector partners that have joined the National Clean Fleets Partnership and the SmartWay Transport Partnership are seeing why deploying advanced vehicles is a win-win for them; for example:

- Last year, AT&T achieved a significant milestone with the delivery of its 7,500th alternative fuel vehicle (AFV). AT&T has committed to deploying around 15,000 AFVs over a 10-year period through 2018. AT&T's AFV fleet includes compressed natural gas, hybrid electric, all-electric, and extended-range electric vehicles. AT&T's deployment of alternative fuel vehicles enabled the company to avoid the purchase of 7.7 million gallons of gasoline from the beginning of the program through the end of 2012. And over the 10-year deployment period these AFV's will save 49 million gallons of gasoline and reduce carbon emissions by 211,000 metric tons.
- Enterprise kicked off a program to make plug-in electric and hybrid cars available to rental customers in major US markets. Four cities have been announced to date (Orlando, San Francisco, Seattle, and Portland). In addition, more than 80 % of their 500 airport shuttle buses now operate on biodiesel or compressed natural gas. Enterprise's fleet is not only the world's largest, it's also one of the most fuel efficient. Approximately 57.3 percent of their vehicles average a highway fuel efficiency rating of at least 28 mpg, and 28 percent of their vehicles average 32 mpg or better.
- Con-Way, a 2013 SmartWay Excellence Award winner, has equipped 100% of its tractors with SmartWay-certified fuel-savings and emissions-reduction technologies, and nearly half its trailers with fuel-saving aerodynamic features. The company's tractors also have automatic idle shutdown, and the company has equipped its tractors and trailers with low-rolling resistance tires to increase miles per gallon and lower carbon emissions.

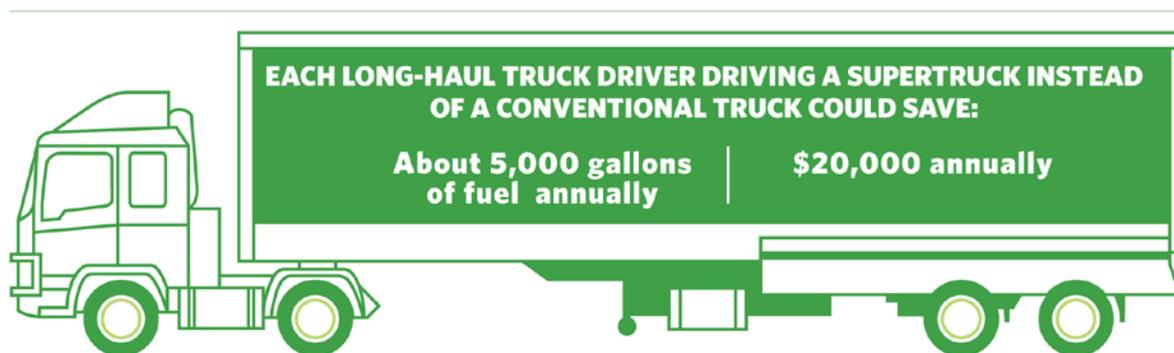
- **Supporting Breakthrough Research and Development:** While the National Clean Fleets Partnership is focused on deployment; the SuperTruck program is focused on the development of highly efficient trucks. Class 8 combination trucks – commonly known as 18-wheelers – serve as the backbone of our domestic freight transportation – hauling about 70 percent of all freight tonnage and over 70 percent of the value of all goods shipped. The Administration's SuperTruck program, launched in 2010 and funded by the Recovery Act and subsequent annual appropriations – and matched dollar-for-dollar by the participating companies, is focused on demonstrating that, by 2015, the freight hauling efficiency of heavy-duty Class 8 trucks can be improved by 50 percent.

Through the program, the Department of Energy has partnered with four major engine and truck manufacturers – including Cummins, Volvo, Navistar and Daimler Truck North America – to increase engine efficiency and overall fuel economy from about 6.5 miles per gallon to about 9.75 miles per gallon. Class 8 vehicles have a total weight (including freight) of 33,000-80,000 lbs. and sometimes more; so every mile per gallon gained in fuel economy is worth thousands of dollars in fuel cost savings per truck per year. Because these vehicles drive so far and consume so much fuel, each long-haul truck driver could save about 5,000 gallons of fuel and \$20,000 annually driving a

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SuperTruck instead of a conventional truck. If all Class 8 vehicles in the U.S. were SuperTrucks, the country would consume nearly 300 million fewer barrels of oil and spend nearly \$30 billion less on fuel each year.

Since 2010, SuperTruck partners Cummins and PACCAR's Peterbilt Motors Company have demonstrated a 20 percent increase in engine efficiency and a 70 percent increase in freight efficiency, reaching over 10 miles per gallon under real world driving conditions on a Class 8 tractor-trailer. Cummins is now working toward developing technologies to achieve even higher engine efficiency. The other three partner teams are also on their way to achieving a 50 percent fuel economy increase—leveraging a range of aerodynamics and engine efficiency technologies, including waste heat recovery technologies. Daimler Trucks of North America has demonstrated 50% engine efficiency and halfway through their project, Volvo has already demonstrated 48% engine efficiency.



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IV. Taking Additional Action

In his State of the Union address, the President outlined a comprehensive agenda to make America a magnet for middle class jobs and business investment. The President highlighted the autoworker, who, implementing the Administration's historic fuel economy standards, "fine-tuned some of the best, most fuel-efficient cars in the world, and did his part to help America wean itself off foreign oil." And the President pledged, "in the coming months" to "build on that success by setting new standards for our trucks, so we can keep driving down oil imports and what we pay at the pump." The President also called on Congress to do its part "by putting people to work building fueling stations that shift more cars and trucks from foreign oil to American natural gas." Today, the President laid out additional details for his plan to improve the fuel economy of American trucks – bolstering energy security, cutting carbon pollution, and spurring manufacturing innovation. Specifically, the President is:

- **Directing the Environmental Protection Agency (EPA) and the Department of Transportation (DOT) to Set the Next Round of Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles.** Today, the President is directing the EPA and the DOT's National Highway Traffic Safety Administration (NHTSA) to develop and issue the next phase of medium- and heavy-duty vehicle fuel efficiency and greenhouse gas (GHG) standards by March 31, 2016. Under this timeline, the agencies are expected to issue a Notice of Proposed Rulemaking (NPRM) by March 31, 2015. This second round of fuel efficiency standards will build on the first-ever standards for medium- and

heavy-duty vehicles (model years 2014 through 2018), and will reach well into the next decade, just like the President's successful national car program.

Increasing the efficiency of medium-and heavy-duty vehicles (below referred to simply as heavy-duty vehicles) is a key component of the President's Climate Action Plan to reduce carbon emissions. Heavy-duty vehicles represent a major opportunity to cut transportation oil use and carbon pollution. In 2010, heavy-duty vehicles represented just four percent of registered vehicles on the road in the United States, but they accounted for approximately 25 percent of on-road fuel use and greenhouse gas emissions in the transportation sector. They are currently the second-largest source of greenhouse gas emissions within the transportation sector (passenger cars and light trucks are the largest source). The first round of standards for medium- and heavy-duty vehicles, finalized in September 2011, is projected to save 530 million barrels of oil and reduce GHG emissions by approximately 270 million metric tons, saving vehicle owners and operators an estimated \$50 billion in fuel costs over the lifetimes of the vehicles covered. For example, an operator of a new 2018 semi truck could pay for the technology upgrades in under a year and realize a net savings of \$73,000 through reduced fuel costs over the truck's useful life.

— *Partnering with Manufacturers, Labor, States, NGOs, and other Stakeholders.* To develop standards that provide long-term certainty and promote innovation, EPA and NHTSA will work closely with stakeholders, both large and small, to explore further opportunities for fuel consumption and emissions reductions beyond the model year 2018 timeframe. EPA and NHTSA will also work closely with the California Air Resources Board (CARB) with the goal of ensuring that the next phase of standards allow manufacturers to continue to build a single national fleet.

— *Supporting Adoption of New Fuel Efficient Technologies.* The second round of fuel efficiency standards will spur manufacturing innovation and lead to the adoption of new fuel-efficient technologies on trucks and semi-trailers. In developing the standards, EPA and NHTSA will assess advanced technologies that may not currently be in production, and will consider, for example:

- Engine and powertrain efficiency improvements
- Aerodynamics
- Weight reduction
- Improved tire rolling resistance
- Hybridization
- Automatic engine shutdown
- Accessory improvements (water pumps, fans, auxiliary power units, air conditioning, etc.).

➤ **Partnering with Private-Sector Leaders to Deploy Advanced Vehicles.** The President has directed his Department of Energy, working with EPA's complementary SmartWay Transport Partnership, to provide each company that wants to partner with specialized resources, technical expertise, and support in developing a comprehensive strategy to reduce fuel use and achieve greater efficiency and cost savings.

In addition, the President is calling on Congress to do its part by:

- **Expanding Fuel Choices for American Drivers.** While the United States will continue to rely on responsibly produced oil and natural gas, President Obama is committed to a long-term policy that allows us to transition to cleaner energy sources.
 - Establishing an Energy Security Trust Fund to Fund R&D for Advanced Vehicle Technologies. In addition to urging Congress to repeal the \$4 billion in subsidies that taxpayers provide the oil and gas industry each year, the President has called on Congress to establish an Energy Security Trust and enact reforms to promote diligent oil and gas development on federal lands. The Energy Security Trust proposal has broad bipartisan support, including retired admirals, generals and leading CEOs, and focuses on shifting our cars and trucks off oil. This \$2 billion investment in a range of cost-effective technologies – like advanced vehicles that run on electricity, homegrown biofuels, hydrogen, and domestically produced natural gas – will be drawn from revenues generated from federal oil and gas development. Establishing a dedicated source of funding will allow the Energy Department to maintain targeted and sustained investments that are catalytic and directly advance U.S. energy security.
 - Supporting Investment in Advanced Vehicles and Infrastructure through a New Tax Credit and an Extension of Tax Credits to Support Cellulosic Biofuels. The President is announcing \$200 million in a new tax credit to catalyze investment in the necessary infrastructure to support deployment of advanced vehicles at critical mass. This proposal would be fuel neutral, allowing the private sector to determine if biofuels, electrification, natural gas, hydrogen, or other alternative fuels would be the best fit in different communities. In addition, the President is proposing to extend the cellulosic biofuel producer credit that expired on December 31, 2013. Cellulosic biofuels have the potential to reduce petroleum consumption and carbon pollution while boosting rural economic development. Extending the existing tax credit would accelerate development of this transformative transportation fuel.