

Combating climate change 426,000 pickup trucks at a time

The Ford F-150 shows how fuel economy standards work and are working



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With gas prices low and the economy recovering, Americans bought record numbers of new vehicles in 2015—also buying more larger vehicles like SUVs and pickup trucks. Amongst the most popular light-duty “half-ton” pickups is the Ford F-150.¹ Americans bought 780,000 F-series Ford pickups in 2015—of which about 426,000 were F-150s. The F-150 also provides a concrete example of how America’s landmark fuel economy standards are working to deliver deep fuel savings and carbon emissions reductions, while transforming automotive technology, rebuilding jobs in America, and getting consumers great vehicles they want and need.

Today’s fuel economy and greenhouse gas (GHG) standards for light-duty vehicles are a win-win for automakers, workers, consumers, and the environment. These “footprint”-based standards require steady fuel economy improvements from each footprint—or size—of vehicle. While older standards tended to spur innovation and efficiency improvements in just one type of vehicle or technology path—such as super efficient small cars that ‘offset’ other vehicles—today’s standards require that efficiency improvements must take place in all types of vehicles—cars, SUVs, and trucks—and these reductions work in combination to achieve emissions reductions goals. This means consumers see fuel savings no matter what kind of vehicle they need, and steady emissions reductions continue no matter what happens to gas prices, the economy, or the size of vehicles consumers choose to buy.

In the past, shifts to larger vehicles have taken fuel economy backwards, but today’s standards change that calculus. The Union of Concerned Scientists recently conducted an analysis looking across

the fleet of cars, SUVs, and pickup trucks and showed that today’s flexible standards ensure ongoing innovation and deep emissions reductions over time regardless of how the overall market shifts (for more, see graph on page 3).² In fact, UCS’s analysis showed that the total amount of carbon emissions saved under these standards—over 600MMT of carbon dioxide (CO₂) in 2040—remains roughly the same even if consumers continue to buy trucks at a higher rate.

But this isn’t just clever math. The fleet wide reductions that UCS calculated are the result of profound change across cars and trucks alike. While only five years into a 15-year standard, the Ford F-150 pickup truck provides a vivid example of the real emissions reductions coming from larger vehicles under today’s standards, and the real investment, innovation, and technological change taking place to deliver those gains.

Fuel savings and pollution reductions are big

The 2015 F-150 is a more technologically advanced, more powerful truck that gets an average of 21 percent better fuel economy and uses 17 percent less fuel compared to 2010 models that were built before the current standards took effect.³

The fuel economy numbers may look deceptively small, but the impacts are large. In 2010, the average⁴ combined⁵ fuel economy of the Ford F-150 was 15.9 miles per gallon (MPG). However, with the new standards in place, fuel economy increased to 17.0 MPG in 2011, to 17.4 MPG in 2012, and to 19.2 MPG in 2015.⁶ Each F-150 bought in 2015 will use about 180 fewer gallons of gas a

year than in the absence of the standards, and it will save its owner eight trips to the gas station and \$300-\$700 per year, depending on the price of fuel. With the most efficient variant of the 2015 F-150 delivering over 325 horsepower and a car-like highway fuel economy of 26 MPG, this is good news and real change for consumers, but it also rolls up to big benefits for the environment.

As popular as they are, F-150s are only a small portion of all vehicles.⁷ The 2.1 million F-150s sold since the fuel economy standards came into force in 2011 make up less than 1 percent of all the vehicles on the road in the United States. Nonetheless, the fuel economy savings from just these new F-150s sold since 2011 save 5 million barrels of oil a year and cut carbon emissions by 2.3 million metric tons—roughly the equivalent of the annual carbon emissions of providing power to the City of Boston.⁸

Over their lifetime on the road, the 426,000 F-150s sold in 2015 alone will save 25 million barrels of oil and cut 11 million metric tons of CO₂.⁹

Real pollution cuts come from real change in technology and manufacturing

The large reductions in fuel use and pollution are just one way in which the standards are working. The F-150 also provides an example of the scope of technological innovation underway in this industry to achieve fuel economy gains, and how the transformation of the whole vehicle fleet is boosting jobs and innovation across American manufacturing.

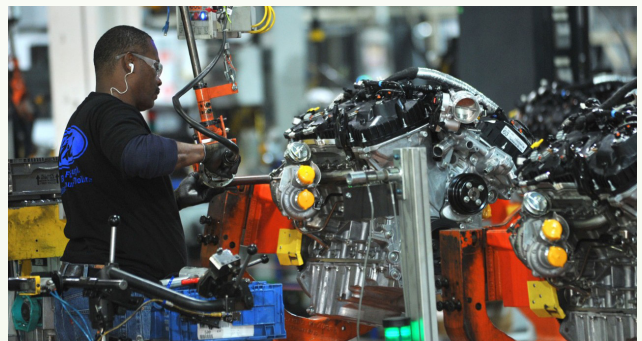
Innovation is happening across vehicle systems and platforms. As part of achieving that first jump in fuel economy from 2010 to 2011-14, Ford introduced its “EcoBoost” line of redesigned engines. Now used across Ford cars and trucks, these engines are downsized and turbocharged so that they achieve the same or greater power using less fuel—along with utilizing novel materials and engine design. Ford holds 275 patents on elements of its EcoBoost alone,¹⁰ and manufacturing the EcoBoost has meant reinvestment and job growth at Ford’s Cleveland, Ohio, Engine Plant No. 1, which today employs 1,600 people.¹¹ Consumers also like the EcoBoost, with nearly two thirds of F-150 buyers opting for the more efficient engine in 2015.¹² In addition, powertrain innovation is ongoing, with 10-speed automatic transmissions anticipated to be part of upcoming vehicles.¹³

Emissions gains also come from suppliers of components. Starting in 2011, the F-150 included advanced electric power steering (EPS) systems, which reduce fuel use 4 percent relative to the hydraulic power steering traditionally used in trucks. These EPS systems are made by Nexteer, a hundred year old company which emerged from the bankruptcy of its parent company in 2010, and today is the largest single employer in Saginaw County, Michigan employing over 5,000 people and supplying the pickup truck market worldwide.¹⁴ The company is rapidly growing; it recently delivered its 30 millionth EPS system, and is now developing electronic steering controls for autonomous vehicles.¹⁵

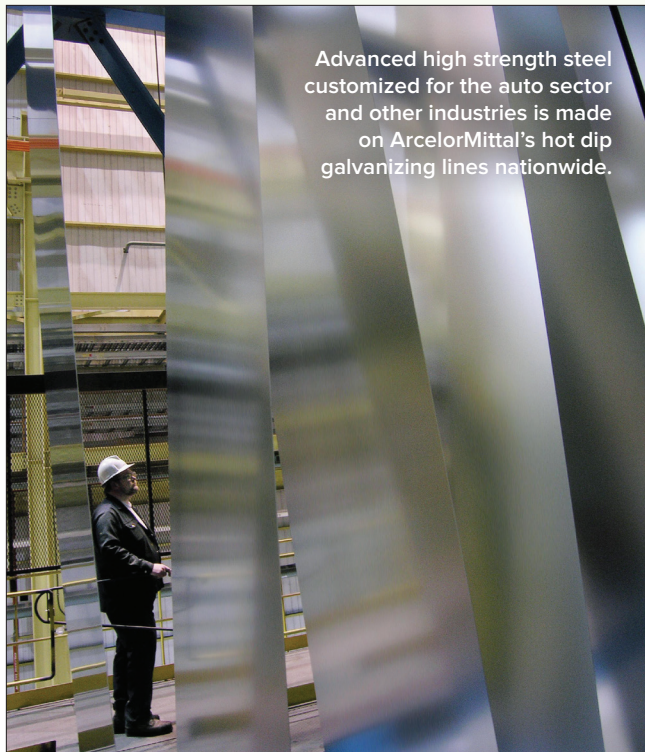
Chevy trucks show breadth of automaker innovation.

Across the industry, automakers are taking a variety of paths to meet new standards and deliver great vehicles that meet different customer needs. Across its Chevy and GMC brands, General Motors (GM) sold over 900,000 pickup trucks in 2015.¹⁶ GM reintroduced its midsize pickup, the Chevy Colorado, which won Motor Trend’s “Truck of the Year” award in 2015 and again in 2016, for a redesign that included a super efficient diesel engine that delivers 31 mpg highway.¹⁷ Members of IUE-CWA Local 755 build the new engine at DMAX in Moraine, Ohio. Meanwhile, the full-size Chevy Silverado uses a suite of engine technologies including direct fuel injection, continuously variable valve timing, and cylinder deactivation which saves fuel by enabling the engine to switch between using four or six cylinders as power needs vary.¹⁸ This year, GM will also roll out Silverado pickups with “eAssist” technology in the California market. Drawing technologies and components from its innovative Volt and Bolt electric vehicle lines, GM’s eAssist is a light hybrid technology that inexpensively provides greater power and acceleration to the Silverado while improving fuel economy significantly in city driving.

Meanwhile, automakers are using innovative design and materials—advanced high strength steels, aluminum, magnesium, and even carbon fiber—to make vehicles lighter and stronger. To make the next big jump in fuel economy, Ford chose aluminum and lightweight high strength steel to cut up to 700 pounds from the weight of its flagship truck, which required innovation and investment across the country. For example, to make dedicated automotive aluminum, aluminum producer Alcoa invested \$275 million and added 200 jobs to expand its rolling mill in Alcoa, Tennessee. The company invested \$300 million in its Davenport, Iowa, facility, where the aluminum is further customized to facilitate bonding between aluminum components.¹⁹ Because aluminum has to be joined differently than steel, however, Ford also retooled its body shop and robotics at the Dearborn, Michigan, Truck Plant and Kansas City Assembly plant (pictured on



Ford recently announced additional investments in its Cleveland Engine Plant to support strong demand for the next generation EcoBoost engine for the 2017 F-150. The investment will retain or add an additional 150 jobs at the plant.



Advanced high strength steel customized for the auto sector and other industries is made on ArcelorMittal's hot dip galvanizing lines nationwide.

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page 1), where it invested \$1.1 billion and added 900 workers before any aluminum body trucks could roll off the line.^{20,21} Kansas City Assembly, represented by United Autoworkers (UAW) Local 249, currently employs 6,450 hourly employees, the highest ever since the plant opened in 1951.²²

Meanwhile in Cleveland, Ohio, ArcelorMittal operates a sprawling integrated steel mill on both sides of the Cuyahoga River. Parts of the mill have been operating since 1913, but the mill was mothballed in 2008-09. Today, the plant employs 1,900 people. It speeded its product development cycle to keep up with change in the auto industry, and has just completed an upgrade of its hot-dip galvanizing line, which utilizes unique chemistry and continuous annealing to produce advanced lightweight high-strength steel with tailored coatings and surfaces for all types of automotive use. The ArcelorMittal facility, represented by USW Local 979, is also amongst the most productive steel facilities in the world.²³

Whether you're sitting in a new car or truck, or in an auto assembly plant, standards are working

Of course, the innovation doesn't stop with Ford, or with pickup trucks. All across the United States, the hundreds of companies and hundreds of thousands of workers who make components for cars, SUVs, and trucks are also innovating to make their products better, lighter, and more efficient.

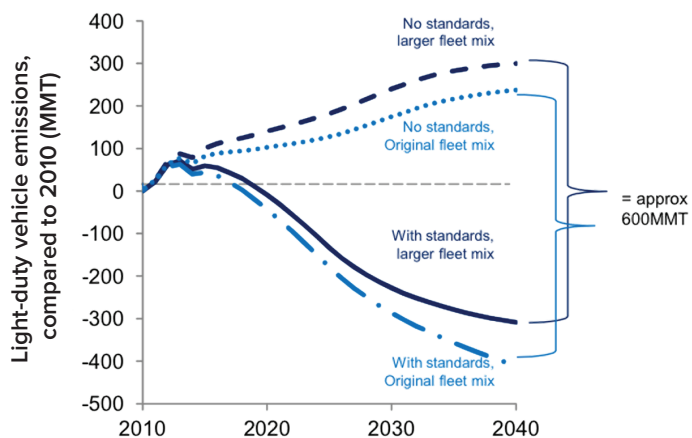
These companies are investing tens of billions of dollars a year in research, development, and manufacturing to build new vehicles of all types which incorporate new more fuel efficient technology.

Strong long-term standards give companies the certainty necessary to make these long term investments, and the smartly structured standards we have today help ensure that those investments continue to be made across the industry. The past half decade of innovation has contributed to a revival in automakers profitability and competitiveness and has brought consumers cars and trucks that not only use much less gas, but are more powerful, more convenient, and more fun to drive—and are selling at record levels. Together with sound manufacturing policies—like the Advanced Technology Vehicles Manufacturing Loan program—and manufacturer commitments to building these technologies in the United States, the standards have helped bring back hundreds of thousands of good jobs, and have helped revive advanced, high-tech American manufacturing.

The mix of vehicles consumers choose to buy will continue to change as gas prices fluctuate, and as the economy, demographics, and technology change. The simple average MPG of the fleet will fluctuate accordingly. The real story is in the dramatic changes across all vehicles, the deep emission reductions relative to business as usual, and the huge changes for drivers and in America's manufacturing economy.

Can we keep this momentum going? Yes indeed, so long as we ensure that these standards keep working.

Emissions savings remain even if car/truck mix shifts



Source: Union of Concerned Scientists.

Over the past 5 years, the economy has recovered, and gas prices have gone from over \$4.00 to nearly \$1.50 and back to around \$2.40 today. Consumers have moved gradually to larger vehicles, and now may be moving back. UCS analysis shows that even if the mix remains more heavily weighted to trucks, footprint-based standards continue to drive deep carbon emissions reductions.

Endnotes

- 1 “Best-selling pickup trucks: December 2015,” PickupTrucks.com, January 5, 2016. Available: <http://news.pickuptrucks.com/2016/01/best-selling-pickup-trucks-december-2015.html>.
- 2 UCS analysis, June 2016. Available: <http://www.ucsusa.org/sites/default/files/attach/2016/06/Fuel-Economy-Standards-SUVs.pdf>.
- 3 The BlueGreen Alliance thanks UCS for sales weighted per model/per vehicle configuration fuel economy calculations, using sales data from Wards and fuel economy data from EPA.
- 4 In both 2010 and 2015, Ford built several variants of the F-150 with different powertrains and different fuel economy. We use a sales-weighted average of their combined fuel economy to get a representative average for F-150s as a whole.
- 5 “Combined” fuel economy is an average of city and highway fuel economy under representative driving conditions. For example, the 2010 F-150 with 2WD and a 4.6L engine had fuel economy of 15mpg city/19mpg hwy and a resulting 16mpg combined fuel economy rating.
- 6 Throughout this factsheet, real world fuel economy is cited as shown on vehicle window stickers and reported by EPA to consumers. These numbers will appear lower than the fuel economy values used for technical compliance, which rely on a different testing protocol and include certain credits.
- 7 F-150s were about 2.4 percent or 1/40 of the 17.5 million total new vehicles sold in 2015. There were 253 million *total* cars and trucks on the road in the US in 2014.
- 8 Boston’s Greenhouse Gas Emissions, City of Boston. Accessed June 21, 2016. Available: <http://www.cityofboston.gov/climate/progress/tracking.asp>.
- 9 Calculations, UCS and the BlueGreen Alliance.
- 10 “Record Number of Ford Inventions Drives Innovation In Autonomous, Connected Vehicles, Electrification, Wearables,” Ford, December 15, 2015. Available: <https://media.ford.com/content/fordmedia/fna/us/en/news/2015/12/22/record-number-of-ford-inventions-drives-innovation.html>.
- 11 “Cleveland Engine Plant Gets \$145 Million Upgrade, Creates 150 Jobs For New EcoBoost Engine Production,” Ford, February 26, 2016. Available: <https://media.ford.com/content/fordmedia/fna/us/en/news/2016/02/26/cleveland-engine-plant-gets-145-million-upgrade-creates-150-jobs.html>.
- 12 “EcoBoost Sales Up 46 Percent Year to Date,” Ford, November 11, 2015. Available: <https://media.ford.com/content/fordmedia/fna/us/en/news/2015/11/11/ecoboost-sales-up-46-percent-year-to-date-expected-to-top-1-million.html>.
- 13 “More Torque And Better Boost: 2017 Ford F-150 To Debut With All-New 3.5-Liter EcoBoost Engine And 10-Speed Transmission,” Ford, May 3, 2016. Available: <https://media.ford.com/content/fordmedia/fna/us/en/news/2016/05/03/2017-ford-f150-more-torque-better-boost.html>.
- 14 “UAW Local 699 Ratifies New Nexteer Contract,” Michigan Live, December 19, 2015. Available: http://www.mlive.com/news/saginaw/index.ssf/2015/12/uaw_local_699_ratifies_new_nex.html.
- 15 Detroit Free Press (via nexteer.com), “Global Auto Supplier Exec Sees Detroit as Place to Be,” February 9, 2015. Available: <http://www.nexteer.com/in-the-news/global-auto-supplier-exec-sees-detroit-as-place-to-be/>; “Moody’s Changes Nexteer’s BA1 Rating,” Moodys.com, Nov 24, 2015. Available: https://www.moodys.com/research/Moodys-changes-Nexteers-Ba1-ratings-outlook-to-positive-PR_339631.
- 16 “Best selling pickup trucks: December 2015,” Pickuptrucks.com, January 2016. Available: <http://news.pickuptrucks.com/2016/01/best-selling-pickup-trucks-december-2015.html>.
- 17 “An Ode to the Chevy Colorado, The Truck of the Year,” Outside Online, November 30, 2015. Available: <http://www.outsideonline.com/2038876/motor-trend-names-chevy-colorado-truck-year-second-year-row/>; “Chevrolet Introduces Colorado Duramax Diesel,” Chevrolet, July 28, 2015. Available: http://media.chevrolet.com/media/us/en/gm/news.detail.print.html/content/Pages/news/us/en/2015/jul/0728_colorado_diesel.html.
- 18 “Silverado Delivers Class Leading Power With 6.2L Ecotec 3,” GM, May 29, 2013. Available: <http://media.gm.com/media/us/en/chevrolet/vehicles/silverado/2014.detail.html/content/Pages/news/us/en/2013/May/0529-silverado-6-2L.html>.
- 19 “Alcoa Completes \$300 Million Automotive Expansion in Iowa to Meet Growing Demand for Aluminum Intensive Vehicles,” Alcoa, January 14, 2014. Available: http://www.alcoa.com/global/en/news/news_detail.asp?pageID=20140114000184en&newsYear=2014.
- 20 “Kansas City Assembly Plant Comes On Line As Second U.S. Factory Building All-New Ford F-150,” Ford, March 12, 2015. Available: <https://media.ford.com/content/fordmedia/fna/us/en/news/2015/03/13/f150-kansas-city-assembly-plant.html>.
- 21 “Assembling Ford’s Aluminum Wonder Truck,” Assembly Magazine, March 3, 2015. Available: <http://www.assemblymag.com/articles/92728-assembling-fords-aluminum-wonder-truck>.
- 22 “Ford will add 900 workers at Claycomo plant to build the F-150 truck,” Kansas City Star, February 3, 2015. Available: <http://www.kansascity.com/news/business/article9171926.html>.
- 23 ArcelorMittal Cleveland website and company presentations: <http://usa.arcelormittal.com/our-operations/steelmaking/cleveland>



The BlueGreen Alliance is a national partnership of America’s largest labor unions and most influential environmental organizations dedicated to creating good jobs, a clean environment, and a fair and thriving economy.

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