Union of Concerned Scientists

EXECUTIVE SUMMARY

Automaker Rankings 2018

The Environmental Performance of Car Companies

HIGHLIGHTS

The product planning decisions of a small number of automotive companies have an immense influence on the environmental health of the United States and the world. This report—the seventh in a continuing series the Union of Concerned Scientists launched 18 years ago—analyzes the bottom-line environmental performance of the entire industry and focuses on the eight full-line manufacturers that together account for 90 percent of the cars and trucks sold in the United States. Using publicly available data on model year 2017 vehicles, we evaluate each automaker's average per-mile emissions of smog-forming and global warming pollutants. This report highlights leadership across the industry and outlines a path forward for both the leaders and laggards.

Automaker Rankings 2018 measures environmental performance based on the global warming and smog-forming emissions of new vehicles sold in the United States. This analysis, our seventh such report since 2000, looks at automakers' levels of emissions, the technologies deployed to reduce these emissions, and ways to ensure continued progress.

Historical Perspective

Manufacturers have achieved a record low in emissions from the average new vehicle. However, the pace of reductions is slowing. Toyota exemplifies this trend—the average vehicle it sold in 2017 emits *more* global warming emissions than those it sold in 2013, when we last assessed the fleet. Ford and Hyundai-Kia showed similar difficulty in improving their fleets, with average global warming emissions from their vehicles flatlining compared with the previous report. This slowed pace indicates the need to step up efforts to reduce emissions.

Some of this slowdown is a result of the industry-wide shift in sales from cars to SUVs. However, a closer analysis shows that not all manufacturers invest equally to reduce emissions from the vehicles they sell, regardless of the fleet mix. Some automakers have been able to continue to ratchet down their average emissions, even as SUVs make up a greater share of their sales. Honda, for example, has shifted 15 percent of its sales from cars to SUVs since 2008, on par with the industry as a whole, even as the company has shown steady progress at reducing emissions (81 g/mile, or 18 percent). On the other hand, while Toyota has seen a

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Decisions made by automakers on the technologies deployed in new vehicles will have a lasting environmental impact as soon as they roll off the production line.

slightly larger-than-average chunk of its sales move from cars to SUVs (an increase of 22 percent), it has seen less than half the reductions in the average emissions of its vehicles compared with Honda (36 g/mile, or 8 percent)—the least of any major manufacturer. This outsized lack of progress is only explained by Toyota's stagnation in improving the efficiency of the very vehicles in which it is increasing sales, its SUVs.

Federal vehicle standards were designed in consultation with the industry to push manufacturers to provide more efficient vehicles in every class, but not all manufacturers are striving equally to live up to their end of the deal. With manufacturers' efforts to lobby for weaker fuel economy and emissions standards, the industry is entering a period of tremendous uncertainty—how automakers emerge depends on the level of leadership they show in providing consumers with more efficient vehicles of all types.

Industry Perspective

Honda finds itself the major manufacturer with the lowest average emissions, but that position places the company well behind Tesla in overall performance (see the table). Innovation by smaller manufacturers constitutes one of the key reasons that the Union of Concerned Scientists will no longer recognize the title of Greenest Automaker (see the box): bold leadership toward a more sustainable future is not limited to innovation from large, full-line automakers.

When it comes to industry laggards, the Detroit Three continue to fall well behind the pack. To give a sense of scale, the only companies with worse environmental performance than Fiat Chrysler (FCA) were low-volume manufacturers that sell nothing but exotic cars for hundreds of thousands of dollars. FCA, no doubt, has aimed to be part of that club, with its growing offering of high-performance Hellcat vehicles, but the real reason it continues to fall to the bottom is that almost

Environmental Impact of Vehicles Sold in MY2017

Manufacturer	Emissions Scores			Rank
	Smog-Forming	Global Warming	Combined	
Tesla	37.6	30.4	34.0	
Honda	**82.7**	**84.2**	**83.4**	**1**
Mitsubishi	84.0	84.8	84.4	
Mazda	83.8	86.8	85.3	
Subaru	85.2	87.2	86.2	
Hyundai-Kia	**89.0**	**88.3**	**88.6**	**2**
Nissan	**88.3**	**91.5**	**89.9**	**3**
Volkswagen	**94.5**	**95.0**	**94.7**	**4**
BMW	94.2	97.2	95.7	
Toyota	**98.7**	**97.9**	**98.3**	**5**
Industry Average	100.0	100.0	100.0	
Geely (Volvo)	103.4	99.0	101.2	
Mercedes	104.7	105.6	105.2	
Ford	**108.1**	**107.8**	**107.9**	**6**
Jaguar Land Rover	99.2	117.3	108.2	
General Motors	**114.2**	**110.3**	**112.3**	**7**
Fiat Chrysler	**115.5**	**116.5**	**116.0**	**8**
McLaren	129.3	128.6	128.9	
Ferrari	140.1	142.6	141.4	
Aston Martin	145.7	149.8	147.7	

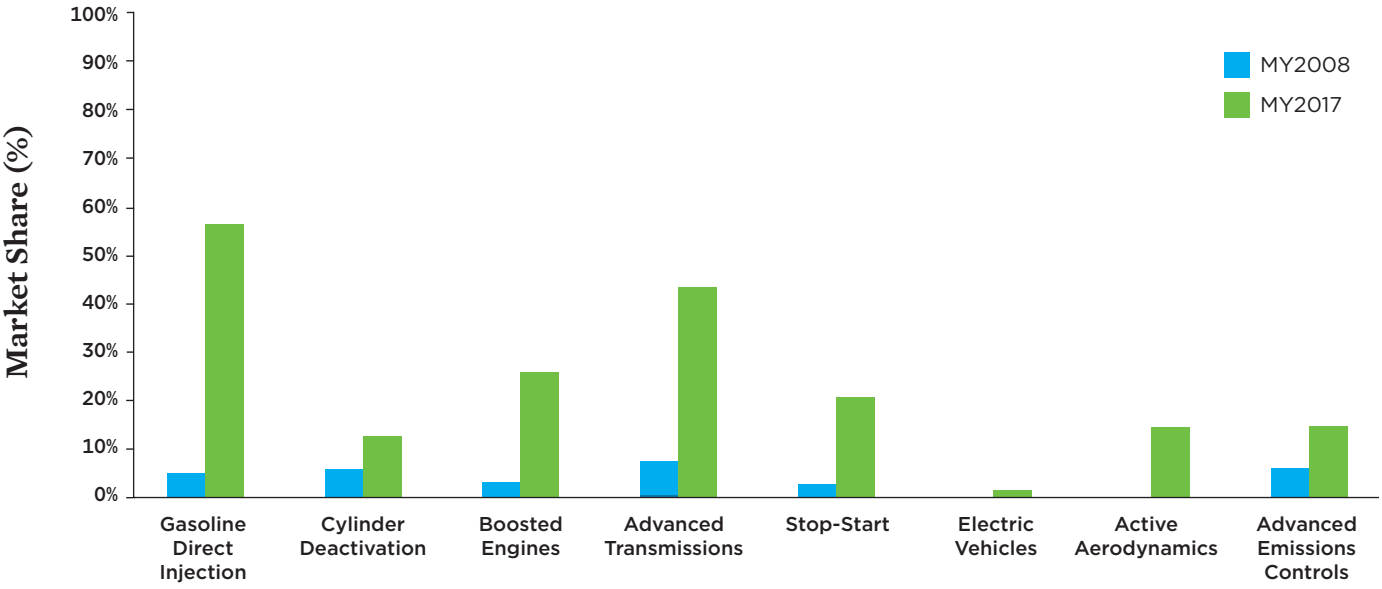
Emissions from the average vehicle have reached the lowest levels in the history of the Automaker Rankings*, but large disparities continue to exist within the industry.*

Notes: Emissions scores reflect both direct tailpipe and upstream emissions and are scaled to an industry average of 100. Combined scores reflect an average of the smog-forming and global warming emissions scores. Full-line manufacturers are shaded and ranked, to aid comparison with previous *Automaker Rankings*.

The Union of Concerned Scientists Is No Longer Awarding a Greenest Automaker Title

In past *Automaker Rankings* reports, the Union of Concerned Scientists has awarded the title of Greenest Automaker to the full-line automaker atop the ranking. Beginning with this report, we have decided to no longer award that title for two significant reasons. First, the notion of "greenest" clearly carries a lot of weight, and we recognize that emissions are not the only measure of sustainability. Second, previous reports have considered only major, full-line manufacturers (those offering a variety of both cars and trucks) to ensure a more equitable playing field by which to judge the industry. However, as highlighted in this report's analysis, this practice ignores the significant technological progress occurring at smaller firms. Consequently, we are retiring the title of Greenest Automaker to better focus on the technological leadership among *all* manufacturers and what that means for consumers. We will continue to rank the full-line manufacturers to highlight that not all major automakers invest equally in providing more efficient, lower-emission choices for their customers.

FIGURE ES-1. Penetration of an Assortment of Technologies to Reduce Emissions from the 2008 and 2017 New Vehicle Fleets



All technologies illustrated have seen substantial growth in market share as a result of strong fuel economy and emissions standards. However, no technology highlighted is deployed in even close to 100 percent of the fleet, indicating room for further deployment to continue progress and meet even stronger standards over the next decade.

When it comes to industry laggards, the Detroit Three continue to fall well behind the pack in terms of reducing their fleets' emissions.

every class of vehicles it sells is inefficient. Unfortunately, Ford and General Motors are beginning to fall into the same trap, ranking well behind the industry average.

Technological Perspective

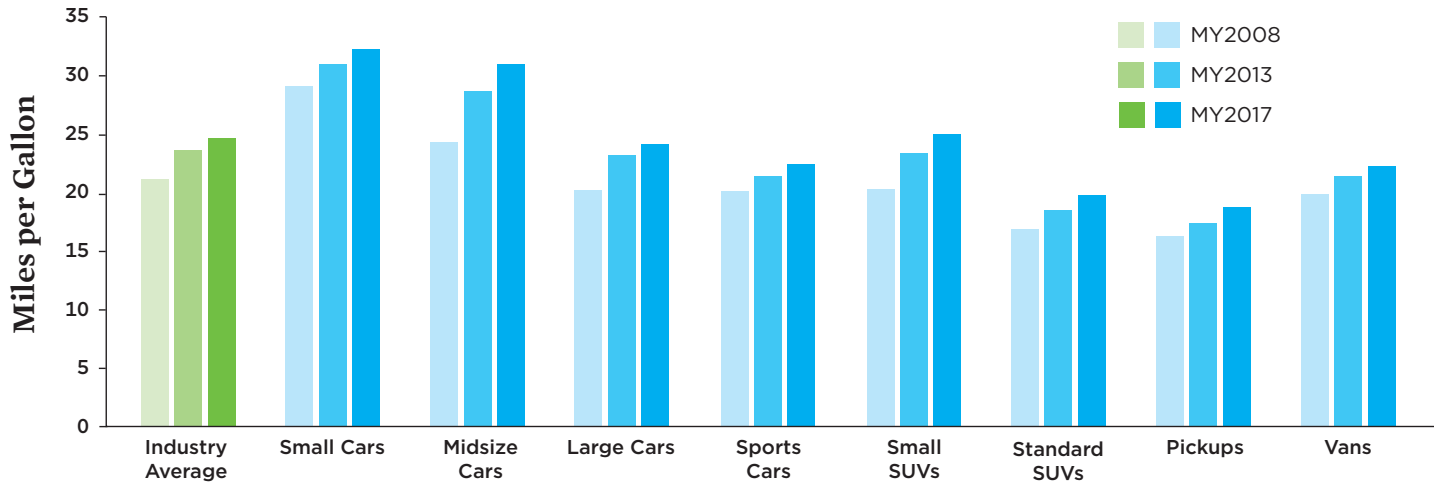
With federal standards pressing companies to invest in improving gasoline-powered vehicles, technologies to reduce fuel use have continued to improve. However, automakers barely deploy even some of the most cost-effective and readily available technologies in today's vehicle fleet (Figure ES-1). To meet tomorrow's challenges, manufacturers must continue to move these technologies into newly refreshed and redesigned vehicles. After all, consumers cannot buy what is not produced.

Consumer Perspective

Federal vehicle standards push manufacturers to make each of their vehicles more efficient—and that improvement is apparent in our analysis. Figure ES-2 (p. 4) shows that fuel economy has improved in every vehicle class, but the most popular segments (midsize cars and small SUVs) have actually shown the greatest improvement. That is great for consumers, who now have more efficient options no matter what type of vehicle they plan to purchase.

This report highlights five vehicles in which automakers have adopted a range of strategies to reduce fuel use, one from each of the most popular segments: Chevrolet Cruze (small car), Hyundai Sonata (midsize car), Honda CR-V (small SUV), Volvo XC90 (standard SUV), and Ford F-150 (pickup). These vehicles improved at a rate greater than the industry average in each of their classes and are emblematic of the varied technology options manufacturers can deploy to reduce fuel use for their customers.

FIGURE ES-2. Average Fuel Economy over Time, by Vehicle Segment



Since size-based federal standards were first finalized for cars and trucks in 2009, each class of vehicles has gotten significantly more efficient. Small SUVs now have fuel economies greater than midsize sedans did in 2008. However, a shift toward larger vehicles has caused the increase in the industry average fuel economy to be much lower than the improvement within each individual vehicle class.

Note: Vehicle classes reflect the classification scheme used in the current report, rather than the classification given in Kliesch 2010 or Cooke 2014, to ensure equitable comparison.

At the same time, these examples are but a snapshot in time, and manufacturers are already pushing forward with innovative vehicles headed to showrooms in the coming years. This year's *Automaker Rankings* highlights some of the vehicles and their technologies to provide consumers with a clearer picture of where the industry could be headed.

Future Perspective

With automobile manufacturers lobbying to weaken fuel economy and emissions standards, the industry finds itself at a crossroads, facing significant uncertainty and opportunity. On the one hand, automakers and suppliers have developed a wide range of technologies to reduce fuel use, and many of those technologies have barely begun to be rolled out. On the other hand, history has shown that in the absence of strong standards, manufacturers tend to use their resources to boost performance alone, foregoing reductions in fuel use and increasing emissions.

Numerous automakers say that action on climate change is important, but their actions and their emissions show that while they may talk a good game, the industry is not ready to walk the walk. This report outlines concrete steps that each manufacturer can take to move toward the more sustainable future in which so many claim to believe.

This time of uncertainty provides the industry with a point of decision. It is time for industry to seize that opportunity—and maybe the next *Automaker Rankings* will show that automakers are actually accelerating toward a cleaner future instead of fighting to slam on the brakes.

Union of Concerned Scientists

FIND THE FULL REPORT ONLINE: www.ucsusa.org/autorankings2018

The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with people across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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