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What Compromise?

By [BILL VLASIC](#)

THE formula for better fuel economy in cars has long been a simple equation: the smaller the vehicle, the farther it goes on a gallon of gas.

Fuel-conscious consumers have been forced to make trade-offs. More size and interior room translated into heavier vehicles and larger engines and increasingly expensive trips to the pump. Saving on gasoline meant choosing narrower, shorter and less powerful vehicles, whether it was a compact pickup truck or a little sedan with a token back seat and minimal creature comforts.

But a quiet revolution has been taking place in the design studios and engineering centers of the world's major automakers, one that is allowing drivers to select vehicles in virtually every market segment without compromising on fuel economy.

It's all happening under the hood, where improvements in engine technology are turning gas-guzzlers into relative fuel-sippers, yet still delivering the horsepower, acceleration and utility that American consumers crave.

Government mileage regulations will force automakers to produce fleets that average 54.5 miles per gallon by 2025, nearly double the current standard.

And while that target seems lofty, the car companies are steadily inching toward the goal by improving the mileage achieved by traditional gas engines as well as introducing more hybrid and electric models.

“The average car in 2025 will get the kind of mileage that today's [Toyota Prius](#) hybrid gets, but we're not talking about some futuristic technology,” said Dan Becker, director of the Safe Climate Campaign, a Washington organization that promotes efforts to mitigate [global warming](#). “Most of the changes will be invisible to the consumers and achieved with better engines, transmissions and aerodynamics.”

The American auto industry has endured a rough ride in recent years. The economic crisis in 2008 pushed the Detroit automakers to the brink of insolvency. Sales withered, and the car companies were forced to slash unsustainable costs and payrolls. General Motors and Chrysler were forced to seek government aid and go through bankruptcy to survive.

But Detroit emerged from the [recession](#) leaner, more competitive and intensely focused on delivering cars and trucks that are fun to drive and practical to own, but also cheaper to fill up, with gas prices that have hovered around \$4 a gallon.

Consumers are discovering cars that meet their needs without busting their budgets on fuel. Bradley Herring, an engineer from Dubuque, Iowa, was recently in the market for a roomy, family-size sedan with the fuel economy of a compact car.

He found exactly what he wanted in, of all places, a Buick showroom. The G.M. brand has historically offered larger vehicles with cushy rides and mediocre fuel economy. But by choosing a [Buick LaCrosse](#) with a small, four-cylinder engine equipped with a direct-injection system, Mr. Herring got the space and comfort of a bigger car with a combined city and highway mileage of nearly 25 miles per gallon.

“I didn’t have to downsize to a compact car to get decent mileage,” he said. “I’m saving about \$15 a week on gas with a full-size sedan that runs on regular gas. It’s not going to make or break me, but every little bit helps.”

Direct-injection technology pushes fuel into the combustion chambers of a traditional engine to create more horsepower at greater efficiency, resulting in better fuel economy and lower emissions. While hardly an automotive breakthrough, the system allows consumers like Mr. Herring to enjoy improved mileage without compromising on size.

“Buying a compact car would have been a big step down from the sedans I’m used to,” he said. “Now I’m able to get pretty good mileage and still have the space I need.”

Fuel economy is among the chief considerations for consumers looking for a new vehicle, according to the auto research Web site [Edmunds.com](#).

“It’s one of the most important factors that people consider when buying a new car,” said Jeremy Anwyl, the chief executive of Edmunds. “But they want to make as few trade-offs as possible, whether it’s the size of the vehicle or the price.”

SEVERAL new models entering the market will broaden the choices for drivers weary of rising fuel costs. Toyota is expanding its Prius hybrid line with a wider, more spacious version, and introducing a new generation of its top-selling Camry sedan. General Motors is rolling out an American-made subcompact, the Chevrolet Sonic, that it hopes will captivate younger buyers with a sticker price under \$15,000. Hyundai has a sporty, compact car, the Veloster, on tap that will get nearly 40 miles to the gallon.

But it’s not just small and midsize cars that are grabbing the interest of mileage-sensitive consumers. G.M., for example, is marketing a new electronic system, called eAssist, that

improves the fuel economy of its larger sedans. The Ford Motor Company has won raves for its EcoBoost technology, which employs direct injection and turbocharging to improve [fuel efficiency](#) in a variety of vehicles.

Ford executives have been pleasantly surprised at the success of the EcoBoost version of its F-Series full-size pickup, the best-selling vehicle in America. “The company felt we could change minds about V-6s in trucks if we delivered fuel economy without sacrificing performance,” said a Ford spokesman, Said Deep.

Still, skeptics wondered whether truck buyers would choose a pickup with a six-cylinder engine rather than the traditional V-8. But the F-Series equipped with the 3.5-liter EcoBoost engine now accounts for about 40 percent of Ford’s F-Series sales, proving that even stalwart pickup owners will downsize their engines to shave fuel costs.

One such convert is Thomas Beattie of Chandler, Ariz., who bought an F-150 with an EcoBoost V-6 engine last May. Mr. Beattie wanted a rugged truck that could go off-road on camping trips with his 5-year-old daughter, but burn less fuel on long drives.

The EcoBoost engine improves fuel economy by about 10 percent over the conventional V-8. Mr. Beattie proudly compared the mileage of his metallic-blue F-150 to that of older-model large sport utility vehicles like the [Chevrolet Suburban](#).

“All those Suburbans are getting between 10 and 13 miles to a gallon,” he said. “But I can set my cruise control to 70 miles an hour and get between 20 and 28 miles per gallon on the highway in my pickup.”

The recent increase in future fuel-economy standards is setting the stage for the next leap forward in pickups — a hybrid truck. Ford and Toyota recently announced plans to jointly develop a hybrid gas-electric system for trucks and large S.U.V.’s.

Hybrids will be an integral part of the industry’s plan to meet the stringent new fuel-economy regulations. Only a small percentage of drivers have embraced hybrid technology, but attitudes are changing as carmakers install hybrid systems in a wider variety of models.

“The hybrid is slowly becoming a mainstream technology,” said Mr. Becker of Safe Climate Campaign. “I suspect there are some people who will never be comfortable with them, but their numbers are growing fewer and fewer.”

Mr. Becker also estimated that all [electric vehicles](#) would compose about 5 percent of new-vehicle sales by 2025. “The automakers are going to need that number to reach the overall fleet average,” he said.

The market for electric cars remains questionable. Nissan's electric Leaf has gotten off to a slower-than-expected start since being introduced last year, although its debut was hampered somewhat by problems related to the tsunami in Japan. G.M. has taken a deliberately patient approach in its rollout of the [Chevrolet Volt](#), a plug-in hybrid electric sedan that runs primarily on battery power but has a small gasoline engine so it can recharge on the fly.

THE Volt gets the equivalent of 93 miles per gallon in fully electric mode, but at a price of more than \$40,000. Even with a \$7,500 federal tax credit, the car is pushing the limits of consumer acceptance because of its high cost.

“There is clearly a curve on which consumers are willing to pay for better fuel efficiency,” said Mr. Anwyl. “At some point, the improvements in technology cost more than people are able to justify.”

When gas was cheap, many consumers didn't blink at paying extra for bigger engines and larger vehicles. Now the situation has reversed. With fuel costs rising, will drivers pay more for an electric vehicle if their gasoline bill shrinks as a result?

“Prices are going to go up as the auto companies adopt more and more technology to meet the fuel-economy regulations,” said Mr. Anwyl. “But how much more will the cars of 2025 cost? Anyone who claims to know is really just guessing.”

The good news is that the Detroit automakers — and the industry in general — are in far better shape financially than during the economic crisis of a few years ago. The companies have more money to spend on improving engines and adding hybrids and electric models, and their engineers and researchers have been given the power to pursue more advanced technology projects.

Sergio Marchionne, the chief executive of both Chrysler and its owner, Fiat, has endorsed the new fuel-economy standards as the challenge the industry needs to accelerate its efforts.

“It will be a huge boost to this industry,” Mr. Marchionne said in a speech at an industry conference in August. “Our powertrain engineers are an incredible pool of talent, and now we can let them do their jobs to the best of their ability.”

The 2025 target of 54.5 miles per gallon is somewhat misleading. Typically, the mileage estimate included on a car's sales sticker is about 20 percent less than its actual fuel efficiency. The Environmental Protection Agency takes real-world driving conditions into consideration when it assigns a fuel-economy number to a particular model. “That 54 miles per gallon will be more like 40 miles to the gallon on average,” said Mr. Becker.

Opinions vary on how much additional cost will be borne by the consumer to achieve the federal targets. “We have a hard time believing that the typical new-car customer will be happy about spending \$2,000 more for his or her new car than they otherwise would for fuel-economy benefits,” said Jack Nerad, a market analyst for the auto-buying guide Kelley Blue Book.

The Obama administration said that whatever the additional costs, Americans would save as much as \$8,000 in fuel costs over the life of a 54.5-m.p.g. vehicle. Beyond that, the administration contends that the program will reduce domestic oil consumption by more than two million barrels a day. “This agreement on fuel standards represents the single most important step we have taken as a nation to reduce our dependence on foreign oil,” President Obama said in announcing the new standards in July.

AUTOMAKERS have expressed confidence that they can achieve incremental goals en route to hitting the final target. Some of the improvement will come from the mix of products — more cars and fewer large S.U.V.’s. However, the bigger challenge will be lowering costs of electric and hybrid models enough to make them more attractive to consumers. Auto executives say they are already preparing long-range product plans that will help them reach the new federal standards by 2025.

“Knowing what’s going to happen long term allows us to invest in technology,” said Susan Cischke, the chief environmental and safety officer at Ford.

Educating consumers about their options in the marketplace is critical as well. Ford, G.M. and foreign carmakers like Honda, Nissan and Hyundai have been aggressively advertising the fuel-economy performances of their best-mileage vehicles. Environmentalists view the competition for bragging rights on fuel efficiency as a positive, if unexpected, development.

“Some of these companies have fought higher fuel standards for years,” Mr. Becker said. “It’s gratifying to see the same companies now competing to achieve the highest fuel economy.”

While consumers appreciate the fuel savings from their high-mileage vehicles, many also derive some satisfaction from knowing their cars are more environmentally friendly. “I’m a little more environmentally conscious than I used to be,” said Mr. Herring, the new owner of the Buick LaCrosse. “I don’t know how the auto companies will reach these new fuel requirements, but I’m definitely in favor of them.”

For the average car buyer, there has never been a better time to shop for a fuel-efficient model. There are more vehicles on the road that get 30 miles per gallon in highway driving than before. Besides the wider selection, consumers do not have to scrimp on size or features to trade up to a model with exemplary fuel economy.

Michael Polk scoured the ranks of new foreign and domestic cars in his search to replace his decade-old [Volkswagen Jetta](#). Mr. Polk, a 43-year-old software developer from Baldwin, Md., needed a family sedan that got excellent mileage on his daily commute (almost 80 miles round trip), but had the latest gadgets.

“I was torn between getting a four-cylinder for best fuel economy and a V-6 sports version of a family sedan,” Mr. Polk said. “Buying a V-6 did not feel economically prudent, not to mention environmentally irresponsible.”

He settled on a [Kia Optima](#) EX Turbo, a midsize sedan with a direct-injection, turbocharged, four-cylinder engine that puts out 274 horsepower and still gets about 26 miles per gallon in combined city and highway driving.

“It’s larger, more powerful and probably gets five miles per gallon better mileage than my old car,” he said. “That’s a pretty big deal to me.”

But he got more than he bargained for when he discovered the benefits of the Optima’s tiny digital display, which showed him exactly what his mileage was as he was driving.

“I’m watching this little gauge and trying to maximize my fuel economy by how I drove,” he said. “It absolutely blew me away that if I drove carefully, I was able to get 36 miles per gallon.”

He tries not to spend too much time on the road watching his mileage gauge. But Mr. Polk can’t help but calculate how much gas he is saving by simply modifying his driving style to take full advantage of his new car’s smaller, more fuel-efficient engine.

For Mr. Polk, calculating mileage and saving on gas is as exhilarating as seeing how fast his car can accelerate from a stoplight.

“I was very excited with my new car, and on the first day I drove it like a teenager,” he said. “Then I found out that I spent more time checking my m.p.g. readouts and driving to increase my fuel economy than I was taking advantage of my car’s sporty capabilities.”

What impressed him was he could have both experiences in the same midsize family car. “With the aggressive new federal fuel-economy targets, I felt like fun in cars might be a thing of the past,” he said. “This gives me hope that we might be able to have our cake and still be able to eat some of it too.”