

Clean Cars

Kicking America's Oil Habit

by Roger Ballentine and Jan Mazurek

The costs of America's dangerous addiction to oil are mounting. Auto emissions are deeply implicated in global climate change, even if the Bush administration is still largely in denial about its risks. The wars on terrorism and with Iraq have highlighted the national security risks of our excessive dependence on imported oil. All of this is fueling a public clamor for a different, less petro-centric energy policy. Yet, the debates in Washington are still mired in political gridlock.

For nearly half a century, transportation has accounted for about one-fourth of total U.S. energy use and two-thirds of total oil consumption.¹ Tailpipe exhaust remains a leading source of air pollution and accounts for roughly one-third of the nation's emissions of carbon dioxide (CO₂), a key contributor to global warming.² Clearly, any serious strategy to promote a cleaner, more secure energy future must be aimed at accelerating the use of newer, cleaner, and more fuel-efficient technologies.

While everyone, including the president, is focusing on the long-range promise of hydrogen as a replacement fuel for oil, that future is still more than a decade away. America cannot afford to waste another decade in which our economic, environmental, and national security is held hostage to our undiminished appetite for imported oil. We need action now.

To make progress toward energy independence, our political leaders need to surmount three obstacles:

- ▶ *The "Drain America First" strategy.* Rather than taking immediate steps to reduce America's dependence on oil from whatever source, foreign or domestic, the Bush administration and its congressional allies insist on focusing the debate on increased domestic production, such as opening Alaska's Arctic Refuge to drilling. This is a phony debate. With only 3 percent of the world's oil reserves, America will always be overwhelmingly reliant on imports to fill our tanks. And while boosting domestic oil supplies will have little impact on world oil markets, it will only worsen our environmental problems.³
- ▶ *Over-the-horizon panaceas.* The White House last year launched an initiative purportedly aimed at putting children born today into clean and efficient cars that eliminate the need to import oil or drill in pristine areas. The \$1.7 billion dollar, five-year "FreedomCAR" program is designed to harness hydrogen fuel cells as a way to reduce U.S. demand for foreign oil by 11 million barrels per day by 2040. Although the initiative sounds hopeful and promises funding, it *requires* nothing—particularly in the near term. Replacing the internal combustion engine with hydrogen fuel cells may very well be the answer in decades to come, but we also need to make progress in the decade at hand—to harness today's

existing technologies to enhance our economic prosperity and promote a healthier environment.⁴

- ▶ *Gridlock over fuel standards.* Created by Congress in response to the energy crisis of the 1970s, Corporate Average Fuel Economy (CAFE) standards require automakers to build cars that get better gas mileage. But falling oil prices and stable supply during much of the 1980s and 1990s undermined the consensus for tough action to reduce consumption and made lawmakers more reluctant to raise CAFE. Automakers complain that CAFE forces them to make costly trade-offs in terms of vehicle performance and safety. They also claim that higher standards would force them to build vehicles that consumers do not want. Twice in these past two years, the White House sided with automakers to defeat proposals to up the standards for cars and light trucks.^{5, 6}

Breaking Political Gridlock

Most economists agree that the most efficient way to curb gasoline consumption is to raise prices at the pump by upping federal fuel taxes.⁷ In December 2003, the Congressional Budget Office released a report that compared options for reducing U.S. oil consumption. The report found, not surprisingly, that an increase in the gasoline tax would achieve the goal at a significantly lower cost than those associated with increasing CAFE standards.⁸ Directly raising prices would also better reflect the hidden costs of using oil: tailpipe pollution and greenhouse gas, congestion, and overseas military deployments. But given the anti-tax mania that has engulfed Washington, this policy tool remains a political non-starter. In fact, Congress created CAFE because it did not want to raise gas taxes.

Though flawed, CAFE remains the most plausible near-term tool we have for reducing oil consumption and spurring the commercialization of new “clean car” technologies.

The key reason CAFE has failed to drive sufficient fuel economy improvements is because it sets a lower miles-per-gallon stan-

dard for trucks (20.7) than for passenger cars (27.5). Not surprisingly, since CAFE’s inception in 1975 the share of new vehicles classified as light trucks (SUVs, minivans, and pickups) has increased dramatically from 20 percent of sales to more than 50 percent of the market today.

The more permissive truck standard was premised on the idea that such vehicles were mostly for business or farm use. Yet the vast majority of vehicles currently regulated as light trucks are in fact used in exactly the same way as passenger cars.

Another flaw in CAFE is that standards are averaged over too many types and models of cars with very different costs of increasing fuel efficiency. A manufacturer of many big and some small cars could have a hard time achieving the standard, but a maker of only small cars would not have any problem at all, even if the former produced a more fuel efficient small car than the latter. The standard does not necessarily encourage either manufacturer to build a more fuel-efficient small car.

The combination of the SUV “loophole” and the fact that CAFE only measures fleet averages has caused automakers to build and sell more and bigger SUVs while trying to keep their “average” up by also making very small passenger cars. This top-heavy, bottom-light approach means that consumers sometimes must choose between the cars they want and those that meet high fuel economy standards.

As concerns about global warming, the instability in the Middle East, and the cost of gasoline grow stronger, the proponents of higher CAFE standards have become more vocal. But now, with the promise of an oil-free and environmentally friendly future via hydrogen, politicians have all the more cover when siding against any present efforts to reduce oil consumption.

We support robust research into fuel cells and hydrogen, including significant federal investments in fuel cell technology, hydrogen production, transportation and storage, and the training of a skilled workforce to run a future hydrogen economy. But the government’s role in encouraging new technologies that address our national interests consists of two phases.

For hydrogen, which remains at the pre-commercial stage, public dollars are best invested in helping to supplement research and development that private markets fail to fully fund. But the federal government must also ensure that taxpayers who fund a portion of that R&D get a return on their investment by adopting policies to compel the private sector to apply these technologies once they are developed.

For fuel cells and hydrogen technologies, we are in the first stage: Government's role is to invest in R&D. For other technologies, however, we are at stage two. Over the past decade, American taxpayers have helped fund R&D for alternative fuels and technologies that can increase the fuel efficiency of our cars and trucks. Many of these technologies (such as hybrid-electric vehicles) are available on the market today (Appendix). Public action is needed to accelerate and expand deployment of these newer but ready technologies.

We need to set a clear national goal: giving consumers the cars they want while reducing oil consumption. This will help to create a stronger and more certain future for our auto industry. By sheltering the U.S. market from fuel efficiency trends that the rest of the world is experiencing, we are in effect practicing short-sighted protectionism. The U.S. auto industry can and must compete and lead the world in the production of a new generation of clean, high-performance cars.

We propose a three-part strategy that America can adopt today to begin dramatically reducing our costly dependence on oil:

1. **Shift gradually from a fuel economy standard to a carbon reduction standard, and institute "tailpipe trading" to reward companies that bring cleaner cars to market.**
2. **While moving toward a carbon standard and trading, make short-term gains by closing ill-conceived loopholes in the current standard.**
3. **Create new consumer tax incentives for buying "clean cars" that burn less oil. To**

accelerate the transformation of today's fleet into tomorrow's cleaner, more fuel efficient one, we need incentives that are performance-based, technology neutral, and of sufficient size to overcome the obstacles of cost and consumer caution about investing in new technology.

We believe this approach can best fill the gap between the mounting, multifaceted costs of our dependence on oil and the more distant promise of hydrogen car technologies, a position concurrent with previous PPI policy reports.⁹

Step 1: Adopt Tailpipe Trading

California recently became the first state to impose greenhouse gas emissions standards on cars. This departure from CAFE's fuel efficiency or miles-per-gallon standards reflects the simple reality that the only way to curb carbon emissions is to burn less carbon-based fuel. California's law, however, is likely to face stiff legal challenges from industry based on the argument that regulating fuel economy is a federal prerogative.¹⁰

Nonetheless, measuring tailpipe emissions is really a more direct and efficient way to achieve CAFE's goals. Efficiency for efficiency's sake is fine, but the real reason we need increased vehicle fuel economy is that we want to burn less petroleum (and thus avoid the security, economic, and environmental problems that result). If someone invented a car that ran on water, we would not be as concerned with whether it got 20 miles per gallon or 30 miles per gallon.

We believe *federal* efficiency standards based on CO₂ tailpipe emissions would prove more effective and less burdensome to administer than CAFE. Because phasing in such a system would take time, we propose that Congress adopt a performance and testing regime that allows manufacturers to meet CAFE standards either by a straight miles-per-gallon measure or by carbon dioxide tailpipe emissions. Because a tailpipe standard is indifferent to what fuel a car burns as long

as its carbon emissions are in compliance, it also would eliminate the many complications and perverse incentives that arise from “crediting” alternative fuels under CAFE.

An emissions-based standard can be made even more effective and efficient by letting manufacturers buy and sell these credits from each other, similar to the tradable emissions allowances that helped reduce acid rain. Under a “tailpipe trading” system, makers of more fuel-efficient vehicles could sell credits to competitors who fail to make the grade. All manufacturers would have a continuous economic incentive to innovate and improve fuel efficiency. According to the CBO, adding a trading component to CAFE would reduce the costs of CAFE by 16 percent—making such a system much closer in cost effectiveness to a straight gas tax.

Creating a tailpipe trading system would not require many changes to the existing program because CAFE currently gives manufacturers credits from the federal government that they can bank and save in the event that their fleet is unable to meet the standard in the future. This program simply takes the banking provision one step further by letting manufacturers trade not only among themselves but potentially among petroleum producers when Congress passes—and the president signs—a system to make CO₂ reduction mandatory. A good model is found in the Climate Stewardship Act of 2003 (S. 139) introduced in January 2003 by Sens. Joe Lieberman (D-Conn.) and John McCain (R-Ariz.).

By first allowing tailpipe CO₂ emission standards as an alternative compliance measure, we will build the regulatory expertise and the private sector familiarity to eventually phase out CAFE’s fuel economy metrics. Just as with CAFE, these standards must be set at aggressive but realistic levels and should again be set separately for vehicle classes.

Congress should task the National Highway Transportation Safety Administration (NHTSA) and the U.S. Environmental Protection Agency (EPA) with developing necessary testing protocols and standards, first for the alternative compliance option and then for a complete phase in.

If done right, we can smoothly transition to a new and simpler regime that will help reduce our dependence on foreign oil and deliver the promise of cleaner vehicles without unduly burdening the automotive sector or consumers.

Step 2: Modernize CAFE

As we set up a tailpipe trading system, we can also *modernize* CAFE by closing ill-conceived loopholes and by making it more performance-driven and flexible. For all its flaws, CAFE has reduced oil imports: The National Academy of Sciences (NAS) in 2002 concluded that, but for CAFE, “gasoline consumption (and crude oil imports) would be about 2.8 million barrels per day greater than it is, or about 14 percent of today’s consumption.”¹¹ But we can do better. With some commonsense CAFE reforms, we can satisfy the environmental community and deliver an auto fleet to American consumers which preserves existing jobs and creates new ones.

- ▶ *Take the “A” out of CAFE.* Congress should abandon the “A” in CAFE, throwing out fleet averages and setting standards by specific classes of vehicles—or delegating the setting of class standards to the executive branch—under strict overall requirements based on total fuel savings or differing percentage improvements in performance for each class. Thus, small vehicles in the company’s fleet would have to meet X standard, mid-size vehicles would have to meet Y average, and so forth. These standards must be developed in a way that will lead to overall fuel consumption reductions based on projected sales. This approach would eliminate industry complaints about being forced to build cars consumers don’t want and instead can get us what consumers want most and what CAFE originally promised: improved efficiency in every type of vehicle.
- ▶ *Close dual-fuel loopholes.* Moving toward a tailpipe emissions trading approach could also help us address the complaint

that CAFE discourages the production of vehicles that run on alternative fuels. Congress originally gave manufacturers additional credits for “dual-fuel” engines that could burn more than just gasoline (for example, ethanol). In practice, however, alternative fuels such as ethanol are only actually used in these vehicles around one percent of the time, yet manufacturers are able to apply their credits to their entire fleet. As the NAS concluded, such practices bring overall fuel economy down and should be eliminated. But if a manufacturer did produce a vehicle that *only* ran on alternative fuels, the tailpipe emission option would give the manufacturer fuel credit for that vehicle and not for those that do not deserve it.

- ▶ *Eliminate light truck loopholes.* Moving to class-based standards based on tough but achievable goals also allows us to get rid of loopholes that let SUVs get lower fuel economy and drag the average of the whole fleet down simply because we call them “light trucks.” The National Highway Traffic Safety Administration (NHTSA) has, in fact, now itself proposed reclassifying some “crossover” vehicles like Chrysler’s PT Cruiser from the light truck category to the passenger car category.¹² This is a good first step, but too many SUVs that are nothing more than passenger vehicles face overly lenient fuel economy requirements.

By eliminating the practice of averaging miles-per-gallon across the entire fleet, manufacturers can concentrate on improvements in each vehicle class—recognizing that a 20 percent increase in efficiency for a vehicle getting 10 miles per gallon is of greater impact in terms of barrels of oil than a 20 percent increase in a vehicle that is already getting 40 miles per gallon.

- ▶ *Eliminate the two-fleet rule.* CAFE currently requires manufacturers to meet standards separately for their domestic fleets of new

passenger cars and their imported fleets. (Domestic models are defined as those comprised of at least 75 percent American parts.) Manufacturers can calculate average fuel economy standards over each of these two fleets, but may not combine the two fleets to come up with one number. The requirement originally was intended to promote the use of domestically produced parts and to discourage domestic manufacturers from simply importing large numbers of very small vehicles originally designed for foreign markets as a way to comply with the CAFE standard.

But in some instances, the two fleet rule has had precisely the opposite effect. By reducing the U.S. content of some of their biggest gas-guzzlers to a level below 75 percent, manufacturers can average their fuel inefficient vehicles with their more fuel-efficient import fleet to comply with CAFE.

Repealing the two-fleet rule would eliminate such practices and the need for automakers to juggle manufacturing decisions to ensure compliance with CAFE for both imported and domestically produced vehicles.

- ▶ *Modernize testing.* We also need to alter the regulations that govern the testing of vehicle efficiency for CAFE purposes. For example, vehicles are currently tested on a dynamometer with all auxiliary systems turned off. Thus, a car or light truck with an advanced battery system that powers air conditioning and other vehicle functions will provide real fuel savings but will not receive credit for that increased efficiency under current tests. On the other side of the equation, some vehicles perform unrealistically well when tested under current procedures relative to real world driving, given features and options that are not adequately picked up by the test. Our testing protocols should spur new technologies with stronger incentives while better simulating real world driving conditions.

Step 3: Spur Consumer Spending on Cleaner Cars

Modernizing CAFE will enable automakers to better build clean cars. At the same time, however, consumers need stronger incentives to buy next generation vehicles, to make such vehicles both more attractive to potential buyers and more cost competitive with conventional vehicles.

Consider the case of the newest efficiency technology for vehicles on the market, the hybrid vehicle, which is expected to represent 1 percent of new car and truck sales in the United States by 2005. So far, demand for these vehicles has exceeded supply, but when additional models become available next year, their sticker price is still likely to be about \$4,000 higher, or more, than their conventional counterparts. In order to move this emerging technology beyond a niche market in the near term, it is necessary to reduce its cost and promote consumer acceptance.

Consumers can accelerate the turnover of the inefficient American fleet, but they need a reason and the financial ability to purchase more efficient vehicles. Alone, periods of high gasoline prices have not lasted long enough to spur greater consumer spending on more fuel-efficient vehicles.

Using tax credits to move the efficient vehicle market is not a new idea; businesses and individuals currently can write off 10 percent, up to \$4,000, of the cost of electric, fuel cell, and hybrid vehicles. But this provision will be phased out starting in 2004.

Several Congresses have considered but not passed the bipartisan CLEAR Act (a scaled-back version of which can be found in the Energy Policy Act of 2003), which extends and expands existing incentives to promote alternative vehicles. Rather than dictate what type of automotive technology consumers should buy, the proposal is technology-neutral: It would provide a tiered income tax credit for individuals and businesses that purchase dedicated alternative fuel and advanced technology vehicles, including electric vehicles, fuel cell vehicles, and hybrids. The proposal would allow taxpayers to claim a credit of 50

percent of the incremental cost of any such vehicle.

In addition to tying tax credits to technology, the bill also pegs tax credits to emissions. The proposal would provide an additional 30 percent credit to vehicles that meet the Clean Air Act's most stringent emission standards (excepting California's more stringent Zero Emissions Vehicle requirements—a set of regulations unrelated to the state's new tailpipe emissions law).

Incentive packages, such as the CLEAR Act, that are broad-based, technology neutral (including fuel cells, hybrids, and alternative fuel technologies), and of sufficient size to overcome obstacles of cost and consumer caution about investing in new technology, can accelerate fleet transformation.

- ▶ *Offer true alternative fuel vehicles.* Tax deductions for the incremental costs of alternative fueled vehicles should be expanded as these vehicles can reduce petroleum consumption and carbon emissions. Under the CLEAR Act, a base credit of up to \$2,500 would be provided for the purchase of such vehicles. An additional \$1,500 credit would be available for vehicles meeting stricter emissions criteria.
- ▶ *Provide support for fuel cells.* Both chambers have supported significant tax credits, pegged to efficiency and weight, to speed fuel cells to market. This promising technology deserves that support, but not at the expense of other options. At this early stage of advanced alternative vehicle development, tax incentives should be directed at a wide variety of options, rather than seek to promote one type of vehicle technology over others.
- ▶ *Provide incentives for advanced diesel.* Although diesel vehicles get significantly better mileage than comparable gasoline-powered vehicles, concern over the additional emissions of particulate matter and other air pollutants from diesel combustion has limited support for diesel technology in the United States. As a result, the CLEAR Act stops short of

providing consumer credits for advanced diesel purchases. But according to its proponents, this may be an oversight. Industry sources say diesels improve fuel economy by, on average, 40 percent over gasoline vehicles.

New Clean Air Act regulations scheduled to take effect in 2007 also increased the likelihood that producers will be able to reduce particulate matter and nitrogen oxide from diesel through advances in low sulfur fuel and treatment technologies. Known as the Tier II emission standards (Tier I standards were phased during the 1994-1996 model years), the regulations will tighten controls on mobile sources emissions, such as hydrocarbon and nitrogen oxides.

If the advanced diesel technologies can meet the Clean Air Act's emissions standards for mobile sources, then these technologies should be eligible for tax incentives to allow us to benefit from their greater fuel efficiency.

- ▶ *Explore other incentives.* Other possible incentives include an additional one-time credit for a new vehicle that is 50 percent more efficient than the taxpayer's previous vehicle. With the proper tracking, this could help to get the older, least efficient vehicles off the road faster than they might otherwise be traded in.
- ▶ *Encourage new fleet purchasing habits.* Providing additional incentives for rental companies and other private fleets to change their purchasing habits (for example, with a tax credit for increasing the average efficiency of their fleet or

incentives for alternative fuel infrastructure) would not only move the market, but help to acquaint consumers with the newer technologies. The federal government should do more to help develop the market by expanding and then enforcing its efficiency requirements and alternative fuel vehicle purchasing requirements.

Conclusion

Our pressing national security and environmental interests demand that we neither accept today's political gridlock over energy policy nor passively wait for a wholesale shift to a hydrogen economy. Near-term progress will require that we reinvent the politics of fuel economy with rational and reasonable improvements to our present regulatory structure. This will call for both sides in the current debate to take a fresh look at the problem and understand that it is in all of our interests to make real progress now. For the U.S. auto industry in particular, it is imperative that the domestic marketplace continue to lead the world in cutting-edge technologies.

While the president articulates a welcome vision of children born today driving hydrogen-powered vehicles when they turn 16, it is also possible to show leadership now to ensure that today's high school freshmen will have cleaner, more efficient and affordable vehicles to drive when they graduate. The tough issues the nation faces today at home and in the world will not wait for us to build a new hydrogen economy. With bold and practical changes, we can meet the challenges of the decade at hand while building a better future in decades to come.

Roger Ballentine is a senior fellow at the Progressive Policy Institute and president of Green Strategies, Inc. He formerly served as chairman of the White House Climate Change Task Force, deputy assistant to the president for environmental initiatives (1999-2001), and special assistant to the president for legislative affairs (1998-1999). Jan Mazurek directs PPI's Center for Innovation & the Environment.

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Endnotes

¹ U.S. Department of Energy. Energy Information Administration. Available at: <http://www.eia.doe.gov/>.

² Green, David L. and Andreas Schafer, "Reducing Greenhouse Gas Emissions From U.S. Transportation," prepared for the Pew Center on Global Climate Change, May 2003, <http://www.pewclimate.org/projects/ustransp.cfm>.

³ Fox-Penner, Peter, "Clean Growth: A Balanced Energy Policy for the 21st Century," Progressive Policy Institute, 2001; Ronald E. Minsk, "Ending Oil Dependence as We Know It," Progressive Policy Institute, 2002; David J. Hayes, "Domestic Oil and Gas Production: Pursuing a Principled Approach," Progressive Policy Institute, 2002, <http://www.ppionline.org>.

⁴ Sperling, Daniel, "FreedomCAR and Fuel Cells: Toward the Hydrogen Economy?," Progressive Policy Institute, 2003; Peter Hoffmann and Robert Rose, "Speeding the Commercial Use of Fuel Cells and Hydrogen," Progressive Policy Institute, 2003. Both available at: <http://www.ppionline.org>.

⁵ The bi-partisan proposals, cosponsored by Sens. John Kerry (D-Mass.) and John McCain (R-Ariz.), if passed would have increased federal fuel economy standards—currently set at 27.5 miles per gallon for cars and 20.7 mpg for light trucks—to 35 mpg overall by 2016.

⁶ In addition to promoting his hydrogen agenda, President Bush has also formally proposed modestly increasing federal fuel economy standards for light trucks to 21 mpg for model year 2005, 21.6 mpg in 2006 and 22.2 mpg in 2007 — an overall increase of 1.5 mpg, or 7.2 percent.

⁷ See, for example, Darmstadter, Joel, "Options for U.S. Energy Security," Resources for the Future, 2003. Available at: <http://www.rff.org>. Darmstadter estimates that the current federal fuel tax should be raised from its current level of about .40 cents per gallon to close to a dollar.

⁸ "The Economic Costs of Fuel Economy Standards Versus a Gasoline Tax," Congressional Budget Office, December 2003.

⁹ Sperling, Daniel, *op. cit.*, and Hoffmann, Peter and Robert Rose, *op. cit.*

¹⁰ California, on the other hand, argues that it has appropriate authority to regulate greenhouse gas emissions under the Clean Air Act.

¹¹ National Academy of Sciences, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*, Transportation Research Board, National Academies Press, 2002.

¹² Proposed Rule, *Federal Register*, vol. 68, no. 248, December 22, 2003.

Appendix: Some available and near-term automotive technologies to economize on fuel use

- ▶ *Hybrid-electric drives.* Already on the U.S. market in several forms but in limited quantities, combining the power of a smaller gasoline or diesel engine with a regenerating electric motor is an improving yet proven technology that can significantly increase fuel efficiency.
- ▶ *Advanced battery systems and “mild” hybrids.* Although a ubiquitous technology, batteries have proven to be a very challenging problem and one that government research has addressed for some time. Several automakers have been working on advanced battery systems that can significantly improve fuel economy. Larger and more powerful batteries can run auxiliary systems such as air conditioning that currently sap efficiency directly from the engine, and more powerful and advanced electronic systems can even act more like a hybrid by shutting off an engine at idle and instantly restarting it at acceleration.
- ▶ *Digitally controlled variable valve timing.* Computer technology has already yielded significant advances in vehicle technology. Great efficiency can be achieved by applying digital technology to more accurately control the timing of engine valves.
- ▶ *Low resistance and “run flat” tire technology.* We know that tires are a significant factor in vehicle efficiency. Advances in tire technology can reduce fuel consumption by reducing resistance and obviating the need for weight-adding spares without sacrificing performance or safety.
- ▶ *New-generation direct injection, lean-burn technologies.* Diesel engine technology remains both ubiquitous in large vehicles and controversial among consumers and environmentalists. Yet new diesel technologies are improving in ways that can allow us to benefit from the significant efficiency advantages inherent in this venerable technology without suffering an increase in conventional pollutants. Direct injection gasoline vehicles can also get better mileage.
- ▶ *Continuously variable transmissions.* Advanced transmission technologies can add mileage performance to different types of vehicles and engines.
- ▶ *Cylinder deactivation.* Engines that only use the number of cylinders needed at a given time have been around for some time and could be improved and more widely deployed.
- ▶ *Advanced construction materials.* Primarily by reducing weight, advanced materials such as composites can provide great efficiency and equal or greater safety and aesthetics. While more expensive than traditional materials, ongoing advances and economies of scale can help bring down these costs.
- ▶ *Alternative fuel technologies.* And of course, if our cars can run on fuel other than petroleum, we will indeed help to solve our energy security concerns. Natural gas, bio-diesel, and corn ethanol (when produced and transported in such a way as to produce net reductions in energy use and harmful emissions) are all present options.