

**Written Testimony of G. Richard Wagoner, Jr.**  
**Chairman and CEO, General Motors Corporation**  
**Before the House Energy and Commerce Committee**  
**Regarding Climate Change and Energy Security**  
(March 14, 2007)

Good afternoon, Mr. Chairman and members of the Committee. I'm Rick Wagoner, Chairman and Chief Executive Officer of General Motors Corporation. Thank you for the opportunity to speak today about advance technologies and the very important subjects of climate change and energy security.

These, too, are critical issues that are at the forefront of GM's business planning. In recent months, at both the Los Angeles and Detroit auto shows, I've spoken about our approach to the concerns over energy supply, energy availability, sustainable growth, the environment, and climate change.

Since 2001, a series of geopolitical, natural, and economic realities have combined to drive home the fact that we face an increasingly uncertain energy future on a global basis. For the global auto industry, this means that we must as a business necessity develop alternative sources of propulsion, based on diverse sources of energy, in order to meet the world's growing demand for our products.

At GM, we are committing massive resources to meet this challenge. We believe we have an extraordinary opportunity before us and that it is important that we are working on the right things that will really make a difference in oil consumption and CO2 emissions.

We are fully prepared to discuss all of these issues, including carbon constraints on the U.S. economy. However, before we discuss any alternatives, we believe we must first begin with a frank evaluation of the Corporate Average Fuel Economy program (CAFE).

The stated goals of the original CAFE program were to reduce U.S. gasoline consumption and oil imports. However, because the number of vehicles on the road has nearly doubled since CAFE was enacted—and the total number of miles that those vehicles travel annually has also nearly doubled—U.S. gasoline consumption has increased by 60 percent since CAFE was enacted, and U.S. oil imports have increased by more than 100 percent.

These increases occurred despite the fact that, since CAFE was enacted, new vehicle fleet fuel economy has more than doubled for passenger cars and increased 60% for light trucks. GM has led the way in this effort and we do not plan to stand still. We're applying a broad range of technologies, as we have for decades, which will continue to significantly improve fuel economy in the years to come.

CAFE, however, has failed to meet its intended goals because it focuses on only one of four factors that drive U.S. light duty gasoline consumption: 1) purchasing decisions of American consumers - sales mix, 2) total vehicle miles traveled, 3) size of the overall fleet, and finally 4) individual vehicle fuel economy. Data from the government's own Energy Information Administration shows that CAFE requirements alone cannot overcome our increases in petroleum demand -- due to the continued increase in vehicle miles traveled and the increasing size of the fleet. Even so, increases in CAFE standards continue to be one of the major focuses of how to address energy security and climate changes issues.

In addition, CAFE has been particularly damaging to the domestic, full line manufacturers. Because it is based on a fleet average, CAFE is less a measure of the efficiency of vehicles than a measure of the mix of a vehicle fleet. Even if you have the most efficient vehicles in the market, if you also sell a mix of larger vehicles, your CAFE average will be lower than other manufactures of less efficient vehicles that tend to sell into the smaller vehicles segments.

The Administration, in setting the CAFE standards for light trucks for the 2008-2011 model years, attempted to address this competitive inequity problem by

establishing size based targets for light trucks. We support this type of “reform” of the CAFE system – and urge that Congress give the National Highway Traffic Safety Administration (NHTSA) similar authority to reform the passenger car CAFE system before any fuel economy increases are imposed on these vehicles.

In addition, we urge Congress to resist the temptation to set some arbitrary level of future CAFE performance and instead let NHTSA set the appropriate targets. That way, the agency can collect and review confidential and proprietary company product plans and consider the opportunities to increase the fuel economy levels consistent with consumer needs and choices, competitive implications, vehicle and highway safety, technological and economic feasibility, and the impact on U.S. jobs. This Administration has twice undertaken such rulemakings for the light truck CAFE levels. The most recent fuel economy rule for light trucks has now set in place increases for 7 consecutive years (2005-2011) – increasing the standards by 16 percent (about 2% per year) and for the first time adding to the regulated fleet the largest SUVs in the market. These challenging increases in the CAFE requirements allow the automakers to make the progress that they can with conventional technology vehicles, and still focus increasingly on the advanced technology systems and vehicles that can really make a difference in addressing U.S. gasoline consumption.

We understand that for our nation, the original goals of CAFE legislation remain as important as ever. As competitive automakers looking to win consumer purchases of vehicles in the marketplace, we look for opportunities to increase the fuel economy of our new products each time they are introduced. But many of the recent legislative proposals to increase CAFE requirements by 4% per year or more would be extraordinarily expensive and technically challenging to implement—all with little to show for actually reducing oil consumption or emissions.

According to the Administration’s analysis, a 4 percent-per-year increase in CAFE standards will save 8.5 billion gallons of gasoline annually by 2017—only enough to slow the projected rate of increase. In other words, even with the

proposed CAFE increase, America will still be using – and most likely importing – more oil than ever.

It is time to move away from approaches that divert resources from solutions that can actually work. Rather, we must move on to solutions that can truly address not only the legitimate and important issue of reducing gasoline consumption and oil imports, but also the critical challenges presented by CO2 emissions.

The best opportunity for addressing all of these issues over the next decade is through increased use of bio-fuels. And, the bio-fuel with the greatest potential to displace petroleum-based fuels in the U.S. is ethanol.

There are already over 6 million E-85 capable vehicles on America's roads – more than 2 million of which are GM vehicles. And last year, we joined Ford and DaimlerChrysler and committed to double our production of vehicles capable of running on renewable fuels by 2010. That's almost one million E-85 capable vehicles a year by the end of the decade. In November, we also carried our commitment a step further and said that we are prepared to make fully half of our annual vehicle production biofuel-capable by 2012 -- provided there is ample availability and distribution of E-85.

If all of the E-85 capable vehicles on the road today—along with those that GM, Ford, and DaimlerChrysler have already committed to produce over the next decade—were to run on E-85, we could displace 22 billion gallons of gasoline annually. And, if all automakers were to produce half of all new vehicles to be capable of running on E85 by 2012, we could increase the savings to 37 billion gallons of gasoline annually. That's more than quadruple the savings that a 4 percent-per-year CAFE increase would achieve—and, very importantly, enough to actually reduce America's gasoline consumption and CO2 emissions.

4

But as you know, flex-fuel vehicles alone will not get the job done. While these vehicles are on the road or in the works, they are not fully utilizing ethanol right now because of constraints on E85 supply and distribution.

Currently, there are about 170,000 gas stations in the United States, but only slightly more than 1,100 E-85 pumps. A continued push from Congress and the Administration can help grow bio-fuel production and distribution so that we can make a big difference very quickly. We're also doing our part to make bio-fuels more available. We are partnering with government, fuel providers, and fuel retailers across the U.S. to help grow the E-85 ethanol fueling station infrastructure. Since May of 2005, we've helped add 200 E-85 fueling stations in 13 states with more to come.

Beyond the promise of ethanol, there are other real opportunities available to us to reduce U.S. gasoline consumption and address climate change, and none holds more potential than electrically driven vehicles.

Over the last few months, GM has made several announcements related to our commitment to electrically driven vehicles. The benefits of electricity include the opportunity to diversify fuel sources "upstream" of the vehicle. In other words, the electricity that is used to drive the vehicle can be made from the best local fuel sources – natural gas, coal, nuclear, wind, hydroelectric, and so on. So before you even start your vehicle, you're working toward energy diversity. Second, electrically driven vehicles -- when operated in an all-electric mode -- are zero-emission vehicles. And when the electricity itself is made from a renewable source, the entire energy pathway is effectively greenhouse gas emissions free. Simply stated, electrically driven vehicles offer not only the opportunity to displace petroleum, but also the opportunity to reduce greenhouse gas emissions.

Along the continuum of the electrification of vehicles, we are working the entire range. For example, there are what most people think of as "electric vehicles" – pure battery-powered vehicles. Then there are gas-electric hybrids -- which are not, per se, electric vehicles -- but which are, in part, electrically driven.

We have several kinds of hybrid vehicles, either on the road or under development – from the heavy duty hybrid that is used in more than 550 transit buses – to the Saturn VUE and Aura Green Line models (which use our high-value “belt alternator starter” system) -- to our advanced “two-mode” hybrid system (which will begin to show up on our full-size SUVs and pickups later this year).

At the Los Angeles auto show, we announced work on another type of hybrid, the Saturn VUE “plug-in hybrid.” A plug-in hybrid will be a conventional hybrid vehicle with an important difference – the battery will be much more advanced – storing significantly more energy and, of course, being able to be plugged into a standard 110 volt outlet to recharge it. The result will be significantly better “fuel economy” -- based on the petroleum consumption of the vehicle -- and the ability to use diverse energy sources.

No major OEM has built a plug-in hybrid for retail sale because the required battery technology doesn't yet exist. In fact, given what we know today, it's pretty clear that it will take several years to see if the battery technology will occur that will let us bring to market a plug-in hybrid that will meet the expectations and real-world performance that our customers expect -- things like safety, reliability, durability, driving range, recharge time, and affordability.

The Saturn VUE plug-in hybrid will use an advanced battery, like lithium-ion. Production timing will depend on battery technology development. Based on our work with EV1 and our different conventional hybrid-electric vehicles, we already have a lot of experience developing and integrating advanced battery technology into our vehicles.

We're already working with a number of battery companies to develop the technology necessary to build a plug-in hybrid. The technological hurdles are real, but we believe they are surmountable.

Earlier this year, we unveiled the Concept Chevrolet Volt at the North American International Auto Show in Detroit. The Chevrolet Volt is designed to be powered by GM's next-generation electric propulsion system, the E-flex System. The E-flex System can be configured to produce electricity for vehicle propulsion from gasoline, ethanol, biodiesel or hydrogen. The Volt uses a large high energy battery pack and a small, one liter turbo gasoline engine to produce electricity for the electric drive on the vehicle.

The Concept Chevrolet Volt can be charged by plugging it into a 110-volt outlet for approximately six hours each day. When the advanced lithium-ion battery pack is fully charged, the Volt is expected to deliver 40 city miles of pure electric vehicle range. When the battery pack is close to depletion, the small engine spins at a constant speed to create electricity and replenish the battery pack.

One technological breakthrough required to make this concept a reality is the large lithium-ion battery pack. This type of electric car, which the technical community calls an "electric vehicle with a range-extender," would require a battery pack that weighs nearly 400 pounds.

There are other types of electrically driven vehicles that we expect to see in the future as well, including hydrogen fuel cell vehicles, such as the Chevrolet Sequel concept vehicle. A hydrogen fuel cell vehicle is, in fact, an electric vehicle. It drives on electricity that is created by the fuel cell. The fuel cell is little more than a battery that stores electricity in the form of hydrogen. The beauty of a fuel cell vehicle like the Sequel is that the electricity is generated onboard the vehicle without using petroleum-based fuel, and without emissions.

And like electricity, hydrogen can be made from diverse energy sources before it ever powers a vehicle. As part of a comprehensive deployment plan dubbed Project Driveway, we are building more than 100 next-generation Chevrolet Equinox Fuel Cell vehicles that will operate and refuel with hydrogen in California, New York, and Washington D.C.

GM is developing a prototype fuel cell variant of the Chevy Volt that mirrors the propulsion system in the Chevrolet Sequel (fuel cell vehicle). Instead of a big battery pack and a small engine generator used in the Volt concept vehicle, we would use a fuel cell propulsion system with a small battery to capture energy when the vehicle brakes. Because the Volt is compact and lightweight, we would need only about half of the hydrogen storage as the Sequel to get 300 miles of range. We continue to make significant progress in this area, and as a result, we continue to see fuel cells as the best long-term solution for reducing our dependence on oil.

What is driving our commitment and why are we pursuing this course now? Because it is unlikely that oil alone will be able to supply all of the world's growing automotive energy requirements. Because technology is now making it possible. And, because our customers are demanding it.

Each of these types of vehicles, and the technology they represent, has the potential to mitigate the energy and environmental challenges of the automobile. They can have a tremendous impact in the years to come if we're all prepared to make the huge investments necessary to bring them to market.

Again, this is an area where Congress can play a huge role.

- First, biofuels production and infrastructure should be significantly expanded. The market response to renewable fuels is encouraging, but it needs to reach a self sustaining level that is not lessened when gasoline prices fall. Steps to increase the availability of biofuels should help increase its use.

Government should continue incentives for: the manufacture of biofuel-capable flex fuel vehicles; increases in biofuels production; increases for R&D into cellulosic ethanol; and increased support for broad-based infrastructure conversion.

- Second, the government should fund a major effort to strengthen domestic advanced battery capabilities. Advanced lithium-ion batteries are a key enabler to a number of advanced vehicle technologies - including plug-in hybrids. Government funding should increase R&D in this area and develop new support for domestic manufacturing of advanced batteries.

Government funding should also expand development and demonstration of hydrogen and fuel cells. Tremendous progress has been made this decade on fulfilling the promise of hydrogen powered fuel cells. The U.S. needs to stay the course on the President's hydrogen program and begin to prepare for the 2010-2015 transition to market phase. Funding should continue for hydrogen and fuel cell R&D and demonstration activities at DOE. The government should also commit to early purchases by government fleets and support for early refueling infrastructure in targeted locals in the 2010-2015 timeframe.

- Finally, there should be further incentives for advanced automotive technology so that these technologies may be adopted by consumers in large numbers. Well crafted tax incentives can accelerate adoption of new technologies and strengthen domestic manufacturing. Consumer tax credits should be focused on technologies that have the greatest potential to actually reduce petroleum consumption and provide support for manufacturers/suppliers to build/convert facilities that provide advanced technologies.

Government can support all three of these with their purchasing decisions. Government fleets can help lead the way to bringing new automotive technology to market and bringing down the cost of new technologies. The government should continue to purchase flex fuel vehicles; demand maximum utilization of E-85 in the government flex fuel fleets; use federal fueling to stimulate publicly accessible pumps; provide funding to permit purchase of electric, plug-in and fuel cell vehicles into federal fleets as soon as technology is available.

In summary, we at GM believe now is the time for a new, more comprehensive and forward-looking national energy strategy—again, one that ensures we are working on the right things that will really make a difference in reducing oil consumption and CO2 emissions. GM is ready and willing to play a leadership role in helping develop and implement that strategy and we urge the Congress to keep this in mind as it considers what policy initiatives should be enacted.

\* \* \*