WRITTEN STATEMENT OF

DR. KATHLEEN HOGAN

DEPUTY ASSISTANT SECRETARY FOR
ENERGY EFFICIENCY

OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY
U.S. DEPARTMENT OF ENERGY

BEFORE THE
SUBCOMMITTEE ON ENERGY & THE ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES

JULY 26, 2012

Chairman Harris, Ranking Member Miller, and Members of the Subcommittee, thank you for the opportunity to discuss the Department of Energy's (DOE's) transportation portfolio—specifically the Vehicle Technologies Program (VTP). As part of the President's sustained, all-of-the-above approach to American energy, the Department is working to develop advanced vehicle technologies that can secure our energy future.

As Deputy Assistant Secretary for Energy Efficiency in the Office of Energy Efficiency and Renewable Energy (EERE), I am responsible for overseeing DOE's portfolio of energy efficiency research, development, demonstration, and deployment (RDD&D) activities, including those related to advanced vehicles technologies.

Today, with the help of the Department's vehicles programs, the automotive industry is reinventing itself—expanding the number of new, more fuel-efficient and environmentally sustainable vehicles and helping to create jobs throughout the vehicle supply chain. By supporting companies building everything from advanced combustion engines and turbochargers, to cutting-edge batteries and more efficient tires, the Department is strengthening the global competitiveness of America's vehicle-related manufacturers.

The transportation sector accounts for approximately two-thirds of the United States' oil consumption and contributes to one-third of the Nation's greenhouse gas (GHG) emissions.[1] Net expenditures for imports of crude and petroleum products have been hundreds of billions of dollars every year. After housing, transportation is the second biggest annual expense for most American families.[2] Improving fuel efficiency of vehicles and developing alternative fuels represents one of the best opportunities we have to reduce our dependence on oil and lower our transportation costs. The economic, national security and environmental costs of our existing vehicles and transportation infrastructure make developing advanced, more fuel-efficient vehicles and alternative fuels an imperative for the Nation.

The Department is investing in a broad portfolio of near- and long-term vehicle-related technologies that includes electric drive, advanced combustion, advanced fuels and lubricants, biofuels, and hydrogen fuel cells, as well as technologies such as advanced lightweight materials that benefit vehicles regardless of size or propulsion technology. We have set aggressive goals and targets and have mapped out the strategies to achieve them. We are making significant progress by demonstrating the real promise of all of these technologies and justifying our investment.

Today I will address the work and progress of the Vehicles Technologies Program (VTP) in EERE, including:

1. An overview of VTP's budget and activities,
2. VTP's electric drive activities, including the Transportation Electrification Initiative and the EV Everywhere Challenge, and
3. The May 2012 DOE Inspector General reports on the Transportation Electrification Initiative and Clean Cities

[1] U.S. Energy Information Administration, Primary Energy Consumption by Source and Secretion (2010) (accessible at: http://www.eia.gov/totalenergy/data/annual/pecss_diagram.cfm).

[2] Bureau of Labor Statistic, Consumer Expenditures (2010) (accessible at: http://www.bls.gov/news.release/cesan.nr0.htm).

Overview of VTP's budget and activities

EERE's Vehicle Technologies Program (VTP) accelerates the development of advanced, energy-efficient, environmentally-friendly transportation technologies that reduce petroleum consumption and lower GHG emissions without sacrificing vehicle performance. The VTP portfolio reflects a mix of near- and long-term technologies including advanced combustion engines, advanced fuels and lubricants, lightweight materials and propulsion materials, advanced batteries, power electronics and electric motors, and vehicle systems and enabling technologies.

Program activities cover technologies applicable to a broad range of vehicles from light-duty passenger cars to heavy-duty trucks. In tandem with the Administration's historic new fuel economy and fuel efficiency standards, DOE's work in all of these areas will help enable the continued improvement of vehicle fuel economy and efficiency, provide consumers with a variety of choices to save money at the pump (or avoid the pump altogether), and strengthen our national energy and economic security by reducing our dependence on oil.

VTP received $329 million in fiscal year 2012 (FY12) for program activities. Table 1 shows a breakdown of the VTP budget by program area as shown in the FY13 budget submission.

Table 1: An overview of VTP's budget, from the FY13 budget submission.

(Dollars in Thousands)

	FY 2011 Current[3]	FY 2012 Enacted	FY 2013 Request
Vehicle Technologies			
Batteries and Electric Drive Technology	103,163	117,740	203,594
Vehicle and Systems Simulation & Testing	42,647	47,198	56,218
Advanced Combustion Engine R&D	55,987	58,027	55,261
Materials Technology	47,748	40,830	48,475
Fuels Technology	10,692	17,904	11,634
Outreach, Deployment and Analysis	32,914	39,266	33,945
SBIR/STTR	0	7,842	10,873
Total, Vehicle Technologies	293,151	328,807	420,000

Improving the efficiency of internal combustion engines is one promising and cost-effective approach in the VTP portfolio to increasing the fuel economy of highway transportation vehicles. The Department

[3] SBIR/STTR funding transferred in FY 2011was $6,849,000.

has demonstrated a unique combustion strategy with the potential to increase the fuel economy of passenger automobiles by more than 50 percent with very low emissions.
DOE is focusing on overall efficiency improvements to commercial vehicles through our SuperTruck initiative. The goal of SuperTruck is to increase the overall freight efficiency of long-haul tractor-trailers by 50 percent by 2015: with 20 percent coming from engine improvements alone, the rest from improvements such as aerodynamics, low rolling resistance tires, and lightweight materials. These trucks consume well above half of commercial vehicle fuel use, and represent a huge opportunity for introducing new fuel-saving technology because of their rapid turnover rate and high rate of miles travelled. We are approximately halfway through the project and on schedule. We have achieved a 26 percent overall freight efficiency improvement thus far.

VTP's Electric Drive Initiatives

As part of the DOE portfolio approach, the Department places an increased emphasis on vehicle electrification. Electric vehicles (EVs) – both plug-in hybrid electric vehicles (PHEVs) and all-electric vehicles – make sense for a number of reasons:

- Electricity is cheaper than gasoline for powering a vehicle (at about $1 per gallon equivalent gasoline price);
- EVs will reduce America's dependence on petroleum, protecting consumers from price spikes and keeping the money Americans spend on energy here at home; and
- EVs could potentially offer the same or better driving performance compared to today's gasoline powered vehicles.

We face tough competition in the global race for a clean energy economy, but President Obama has put in place a foundation for American leadership in the development, deployment, and manufacturing of advanced vehicles and batteries. While the President's vision for American leadership is ambitious, progress toward this end goal will put the U.S. on a path to lead in the clean energy economy. It will support real consumer choice in the technologies that power our vehicles, helping to end our dependence on oil and reduce greenhouse gas emissions from the transportation sector.

Plug-in electric vehicle sales continue to increase, with sales growth outpacing that of gasoline hybrid electric vehicles when they were first introduced. We expect to see this trend continue, as several new vehicle models were introduced earlier this year, providing additional choices for consumers considering electric drive vehicles.

In the Administration's FY13 Budget, the President proposed steps to accelerate America's leadership in electric vehicle development and deployment, including improvements to existing consumer tax credits, establishment of a commercial tax credit for heavy-duty trucks, creation of a community deployment program to support local investments and policies to spur deployment at scale, and increased investments in research and development in vehicle electrification. DOE's primary activities focus on the research and development of electric drive as well as a variety of other advanced and fuel efficient technologies.

To date, the Department of Energy has worked to develop a domestic capability to manufacture advanced batteries and electric drive components. Together with industry partners who match federal funds dollar-for-dollar, we have created a total production capacity of more than 140,000 EV batteries

per year, and we are on track to reach our goal of having the capacity to support 500,000 EV batteries per year by 2015. While the plug-in vehicle market continues to develop, these facilities are producing advanced batteries for other applications including defense applications, utilities, and power tools. Similarly, facilities that manufacture motors and other electric-drive components are expanding and now filling orders for domestically produced all-electric vehicles. Through these efforts, the United States has developed a domestic battery manufacturing capability that did not exist only several years ago.

To move electric-drive technology beyond initial early adopters, we must continue to reduce the cost and improve the performance of key component technologies such as advanced batteries. Technology developed with DOE support is in nearly every hybrid vehicle on the road today. Now we are building on that success with research and development (R&D) of next-generation technologies. Since 2008, DOE has demonstrated a 35 percent reduction in the production cost of lithium ion batteries.[4] And we are on track to demonstrate an additional 50 percent cost reduction by the end of 2014, bringing the modeled cost to $300/kWh, which will make these vehicles cost-competitive in the market..

Transportation Electrification Initiative

Before 2009, there were fewer than 500 electric vehicle charging stations in America. But in part because of the investments made by the Obama Administration, there are now over 4,000 publically available chargers deployed today. Under the Transportation Electrification Initiative, companies are developing, deploying and analyzing EVs and EV infrastructure, and educating the public to help accelerate the market adoption of advanced electric-drive vehicles. The projects under the Transportation Electrification Initiative represent the world's largest electric vehicle demonstration project and are projected to deploy over 20,000 charging points in residential, commercial, and public locations supporting more than 13,000 plug-in vehicles nationwide. Through these cost-shared projects, DOE will collect information about how consumers use and charge electric vehicles, which will be critical to informing the broader rollout of electric vehicles and chargers nationwide.

As of July 13, 2012, over 11,000 EV charging stations have been deployed in residential, commercial, and public locations with DOE financial support. The majority of these charging stations were the result of cost-shared funding under the Transportation Electrification Initiative. In addition, a smaller number of charging stations have been deployed as part of programs undertaken by the Energy Efficiency and Conservation Block Grants and public-private partnerships such as locally-based Clean Cities coalitions.

As part of the Transportation Electrification Initiative, DOE administered an open, transparent, and competitive solicitation process and awarded funding for Ecotality's EV Project—an effort to develop and deploy a network of charging stations in residential, commercial, and public locations in 18 cities nationwide. Through partnerships with DOE's Oak Ridge and Idaho National Laboratories, the EV Project also created a prototype solar-powered recharging system and robust data collection effort.

The EV Project began on October 1, 2009, and is expected to continue into 2013. Installation activities have been extended past the original expected end date of September 2011 to match the vehicle sales and availability. Strict monitoring and control mechanisms are in place so that Ecotality North America and its project partners are reimbursed only as progress is made and project milestones, such as charging

[4] Cost estimates are based on high volume manufacturing cost projections, using a peer reviewed cost model.

installations and vehicle placements with data collection, are met. As of July 13, 2012, Ecotality had completed 55 percent of the planned charging station installations and 65 percent of the planned vehicles, and it had been reimbursed $57 million, or 57 percent of the total award amount.

EV Everywhere

EV Everywhere, one of the Department's Clean Energy Grand Challenges, is aimed at addressing one of the most pressing energy challenges of our time. EV Everywhere will bring together America's best and brightest scientists, engineers, and businesses to work collaboratively to make electric vehicles as affordable and convenient to own and drive as today's gasoline-powered vehicles within the next 10 years. Success in meeting this goal will help put the U.S. in the lead to manufacture and export the next generation of advanced electric vehicles and electric vehicle components, creating manufacturing jobs and stimulating the American economy.

Automotive manufacturers and suppliers are currently pioneering the way forward in getting the first wave of EVs into the hands of a significant number of U.S. drivers. But today, the prices of these cars are still out of reach for the majority of American families. This Department-wide initiative, which will bring together DOE's Office of Energy Efficiency & Renewable Energy's Vehicle Technologies Program, the Office of Science, and ARPA-E, will aim to make electric vehicles affordable to the average American family by specifically targeting dramatic technological and cost improvements in batteries, electric motors, power electronics, light-weight structures, and fast charging technology.

The aggressive goal of this initiative is, by the year 2022, to enable companies in the United States to be the first in the world to produce a 5-passenger affordable American electric vehicle with a payback time of less than 5 years and sufficient range and fast-charging ability to enable average Americans everywhere to meet their daily transportation needs more conveniently and at lower cost.

The May 2012 DOE Inspector General reports on the Transportation Electrification Initiative and Clean Cities

The Department takes very seriously its responsibility for the effective and efficient use of taxpayer dollar at all times. As such, we welcome input from DOE's Inspector General (IG) and other partners and will work to continuously improve the Vehicle Technology Program.

In May 2012, the IG released a special report entitled *The Department of Energy's Transportation Electrification Program* that discussed the management of the program but made no formal recommendations since DOE took action during the IG's review to ensure program recipients had completed independent audits. These actions included DOE issuance in February 2011 of final guidance on for-profit recipient audits requiring that entities expending more than $500,000 in Federal funds per year obtain an audit for that year by an independent auditor. DOE has now received independent audit reports from five of the six companies participating in the Transportation Electrification program; the sixth recipient will submit a combined 2010 and 2011 audit report by September 30, 2012. For the Transportation Electrification program, there were no costs determined to be unallowable costs as a result of the audits.

In May 2012, the IG also released an audit report entitled *The Department of Energy's Clean Cities Alternative Fuel Vehicle Grant Program Funded under the American Recovery and Reinvestment Act* that discussed management of the program. DOE concurred in part and disagreed in part with some of the IG's findings and recommendations. As the IG report notes, the Department followed established procedures for solicitation, merit review, and selection of Clean Cities projects. With respect to conflicts of interests, DOE agrees that heightened awareness of the potential conflicts of interests by recipients is necessary at all times.

In the case of Clean Cities, DOE carefully reviewed the IG report's findings. By statute, all recipients must undergo an audit, subject to the requirements of the Single Audit Act and revised OMB Circular A-133, which include a review of potential financial conflicts of interest. In addition, recipients must also take steps to identify and mitigate real or apparent conflicts of interest. In the event allegations of potential conflicts of interest are provided to DOE, or the required audits reveal any conflicts of interest during DOE review, the Department would immediately investigate. In the event the allegations or audit results are substantiated, DOE would take appropriate actions to resolve the issue.

DOE also concurred with the IG's recommendation that DOE review recipient reimbursements for the allowability of costs incurred and cost share amounts contributed. As a result of the IG's audit, DOE identified $640,000 in unallowable costs that were subsequently disallowed.

For the remaining costs questioned by the IG, the IG found that DOE lacked adequate documentation of these costs because a recipient may not have sufficiently competed its subcontracts to coalition members, and DOE disagreed with this finding. Throughout the process of awarding Clean Cities grants, the Department evaluated each application according to published criteria based on the work proposed, coalition members described in the application, and the proposed overall cost—a process that aligns with how agencies award financial assistance throughout the Federal government. In this case, recipients held competitions to select coalition members prior to submitting applications for funding to DOE. Holding a new competition to select coalition members subsequent to a recipient's selection for an award would jeopardize the composition of coalitions, thereby significantly altering the basis on which the recipient was selected. As program activities proceed, the Department will continue to work with the IG, Congress, and other stakeholders to improve the Vehicle Technology Program and ensure DOE's strong stewardship of taxpayer dollars.

Conclusion

With efforts like DOE's Vehicle Technologies Program, the Department believes the U.S. can position itself as a leader in the global clean energy sector. Working with industry and state and local partners from across the country, DOE's transportation portfolio will benefit consumers, improve national security through reducing our dependence on oil, and help America lead in transportation manufacturing. Thank you again for the opportunity to discuss these issues, and I welcome any questions.