

## Why Electrification?

Electrifying the light-duty, passenger vehicle transportation system is the best way to enhance our national and economic security by reducing the role that oil plays in the economy because:

- Electrification promotes fuel diversity;
- Electric vehicles will be powered by largely domestic fuels;
- Electricity prices are generally more stable than oil prices; and
- Electrification will increase energy efficiency and reduce energy consumption.

### 01 PROMOTES FUEL DIVERSITY

Petroleum is essentially the sole fuel for the nation's cars and trucks, accounting for 94 percent of delivered transportation energy. That reliance exposes the entire transportation sector to the volatility endemic to the world oil market. Electricity, however, is generated by a diverse set of fuels, including coal, nuclear, natural gas, hydroelectric, wind, geothermal, solar, landfill gas and others. An electricity-powered transportation system, therefore, is one in which an interruption of the supply of one fuel can be made up for by others, and price volatility for one fuel is dampened by stability in others—a far cry from today, when a single event on the other side of the globe can interrupt the flow of oil and dramatically increase the cost of transportation.

### 02 DOMESTIC PORTFOLIO OF FUELS

While oil supplies are subject to a wide range of geopolitical risks, the fuels that we use to generate electricity are generally sourced domestically. Satisfying our transportation energy needs with these domestic fuels will not only reduce the economic risks created by highly volatile oil prices, it will also significantly lower the trade deficit. Since late 2007, crude oil and petroleum products have typically accounted for at least half—and often more—of the monthly U.S. trade deficit. In March 2011, petroleum accounted for 65 percent of the total trade deficit. In fact, America has run an \$84 billion petroleum trade deficit in just the first quarter of this year alone.

### 03 REDUCED PRICE VOLATILITY

Oil prices are highly volatile. The retail price of electricity is not. Power prices reflect a wide range of costs. Generally, the cost of fuel represents a smaller percentage of the overall cost of delivered electricity than the cost of crude oil represents as a percentage of the cost of retail gasoline. This makes retail power prices less sensitive to any volatility in fuel prices. Further, retail power prices are generally set to reflect the average cost of wholesale prices over time, promoting retail price stability.

### 04 GREATER EFFICIENCY AND REDUCED ENERGY CONSUMPTION

Plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (EVs) are more energy efficient than traditional petroleum-fueled vehicles. A detailed examination of PHEV and EV energy efficiency conducted at the Sloan Automotive Laboratory at MIT included an integrated well-to-wheels analysis of the different vehicle technologies to determine their relative level of energy usage. The study concluded that PHEVs and EVs use less energy on a well-to-wheels basis than petroleum-fueled conventional vehicles. While a conventional vehicles consumes 3.35 MJ/km of energy, the various types of PHEVs consumed between 1.16 and 1.32 MJ/km. EVs consumed 1.79 MJ/km.