



## Energy Security Through **Electric Drive**: Achieving a Diversified Fleet of Electric Drive Vehicles and Infrastructure



1. **Reduce Market Hurdles for Vehicles and Infrastructure**
2. **Expand Manufacturing Capacities**
3. **Establish Coherent Regulatory Policies for Electric Drive Vehicles and Infrastructure**
4. **Accelerate Technology Breakthroughs**
5. **Promote Public and Private Outreach and Education to Increase Consumer Awareness**

# **EDTA**<sup>®</sup>

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Dependence on oil is an enormous strategic, environmental and economic liability. It makes energy security impossible. To end oil dependence, the U.S. must implement comprehensive policies to accelerate the electrification of the transportation sector. Electricity is domestically produced, readily available across the nation and environmentally friendly, especially when produced from renewable sources.

If 73% of the nation's light duty vehicles were fueled by electricity, the U.S. could displace an estimated 6.2 million barrels of oil a day, about 52% of current oil imports. (Pacific Northwest National Laboratory)

## Energy Security through Electric Drive: Achieving a Diversified Fleet of Electric Drive Vehicles and Infrastructure

Electric Drive Transportation Association (EDTA) members include leading and emerging vehicle, battery and component manufacturers, as well as electricity providers, smart grid and infrastructure developers, and others advancing diverse technologies that will displace oil with electricity in transportation. Collectively, we are building the advanced vehicles, green jobs, sustainable transportation options and energy independence that comprise the electric drive future.

In 2009, EDTA and its members developed a roadmap of key policy recommendations to accelerate the electrification of the transportation sector and speed the nation toward true energy security. Because changing the U.S. transportation fleet to electric drive won't happen overnight, we called for policies that would get us "on the right road, right away."

Congress and the Obama Administration agreed. In the last year, Washington has worked to put us on the right road by making historic commitments to promote the electrification of the transportation sector. The Administration declared an ambitious goal for plug-in vehicles; substantial funds for electric drive manufacturing were provided in stimulus legislation; and many of our key tax, research and development and deployment program priorities were authorized or funded in the first session of the 111th Congress.

Now, the task is to build on those commitments and move ahead with policies that reflect what we have achieved, what we have learned and what is required to realize the goal of an electric drive future.

As the collective voice of the electric drive industry, we have identified the key "next step" actions for policymakers to achieve our shared goal of a commercial scale electric drive fleet: Reduce Market Hurdles for Electric Drive Technologies; Expand U.S. Manufacturing Capacity; Establish Coherent Regulatory Policies for Electric Drive Vehicles and Infrastructure; Accelerate Technology Breakthroughs; and Promote Public and Private Outreach and Education to Increase Consumer Awareness.

“Electric drive” means that electricity moves the wheels of a vehicle, which can range from a bike or scooter to a forklift, passenger car, bus, truck or any other vehicle. Electric drive technology includes pure battery electric vehicles; hybrid vehicles that combine an electric motor that recharges onboard and an internal combustion or other engine; plug-in vehicles that use electricity from the grid and another fuel source; and fuel cell vehicles that use fuel cell stacks to produce electricity for propulsion.

General Motors will deliver more than 1,700 hybrid buses to transit agencies in Washington D.C., Philadelphia and Minneapolis/St. Paul. GM estimates that the 1,732 buses will save an estimated 2.4 million gallons of fuel annually.

In December 2009, the City of Columbus joined Coca-Cola Enterprises to announce the deployment of heavy-duty hybrid electric delivery trucks to its fleet in Columbus and throughout the state of Ohio. The largest hybrid-electric delivery vehicles in North America, the model GVW 55000 trucks improve fuel consumption by 30 percent, reduce emissions by 30 percent and create less noise and emissions when idling or stopped in traffic.

## I. Reduce Market Hurdles for Vehicles and Infrastructure

Although diverse electric drive vehicles are entering the market, vehicle and infrastructure costs present an initial hurdle to large scale adoption. Incentives and support for private and public acquisition of electric drive vehicle and infrastructure will reduce cost hurdles for consumers and help manufacturers reach the economies of scale that will bring costs down and speed the proliferation of electrification infrastructure.

### Refine Tax Incentives for Electric Drive Vehicles (EV, PHEV, FCEV) and related Infrastructure

- > Support added flexibility in incentives for individual and business consumers, such as credit transferability and point-of-purchase incentives
- > Expand recognition of diverse electric drive infrastructure options for Battery Electric Vehicles (BEVs); Plug-in Hybrid Electric Vehicles (PHEVs); and Fuel Cell Electric Vehicles (FCEVs), stationary and hydrogen storage and refueling in refueling infrastructure incentives
- > Provide incentives for non-propulsion applications for transportation energy storage systems (e.g., batteries and hydrogen/fuel cell systems)
- > Extend and expand incentives for medium and heavy duty electric drive vehicles and qualifying off-road vehicles
- > Evaluate and promote effective options to reduce incremental electric drive costs (including alternative financing, battery warranties, industry insurance pools, fuel cell buy-downs)
- > Accelerate depreciation of smart meters, which are an enabling technology for grid-connected vehicle deployment

### Advance Public and Private Fleet Penetration and Regional Deployment Efforts

- > Expand incentives for private and municipal fleet purchases, including accelerated depreciation/expensing/tax credit options for commercial fleets to promote fleet turnover
- > Promote federal fleet penetration through expanded recognition of electric drive options in the General Services Administration (GSA) schedule and work with Department of Energy’s EAct and Federal Energy Management Programs (FEMP) to educate and assist federal, state and covered fleets in acquiring electric drive vehicles

## ELECTRIC DRIVE TRANSPORTATION ASSOCIATION

A recent battery manufacturer projection estimates that an investment of \$6.1 billion to support advanced vehicle and battery manufacturing in the U.S. would create approximately 24,000 jobs.

Additional economic benefits include almost \$700 million of improvements in the balance of trade and a \$2.3 billion contribution to the GDP from manufacturing alone.

These facilities will also produce a skilled green workforce and a globally competitive domestic electric vehicle industry.

The Chattanooga Area Regional Transportation Authority (ARTA) was formed as part of a city renaissance program. Since 1992, ARTA's Downtown Shuttle service has recorded over 11.3 million passenger trips. The quiet, environmentally friendly fleet of 15 electric buses has run more than 1.9 million miles saving an estimated 65 tons of pollutants.

Toyota is implementing its strategy to offer a wider variety of conventional hybrid choices to its customers, as it begins to introduce plug-in hybrids and battery electrics in model year 2012, and hydrogen fuel cell vehicles in 2015 in global markets. Early this decade, Toyota plans to sell a million hybrids per year globally, a majority of those in North America.

- Support coordinated vehicle and infrastructure deployment
- Expand existing local deployment programs to include coordinated demonstrations that include utility, infrastructure and vehicle solutions in Clean Cities and other programs
- Support regional deployment programs that provide federal support for regional scale vehicle and infrastructure deployment

### Promote Electric Drive in Transit and Commercial Applications

- Expand support for all electric drive technologies in the Surface Transportation Authorization bill including research, development, and deployment of battery electric, hybrid and fuel cell public transit and commercial vehicles and related infrastructure
- Support greater role for Department of Transportation in electric drive expansion, including an expanded role in hydrogen infrastructure standard-setting to include new hydrogen infrastructure demonstration programs

## 2. Expand U.S. Manufacturing Capacity

Producing new electric drive vehicle fleets will require a revitalized manufacturing base to build up U.S. advanced vehicle manufacturing capacity for next-generation hybrid, battery, plug-in and fuel cell vehicles for consumer, commercial and government customers. Congress and the Administration provided key funds for manufacturing support in the American Reinvestment and Recovery Act. The emerging U.S. industry, however, continues to be constrained by lack of access to investment capital. Expanded support for manufacturing will expand U.S. competitiveness while building the green technology workforce.

### Promote federal support for expansion of electric drive transportation-related manufacturing

- Provide additional funds, including grants and loans, for the Department of Energy's Advanced Technology Vehicle Manufacturing Program
- Expand federal electric drive manufacturing support to include medium and heavy duty manufacturing in the Advanced Technology Vehicle Manufacturing Program
- Remove the funding cap on Sec 48C credits for advanced energy investments
- Expand bonding authority for investments in electric drive facilities and related infrastructure (electric and hydrogen)

Ford Motor Company will market a battery electric light commercial vehicle in North America in 2010. The Transit Connect will be available to Ford's commercial vehicle fleet clients. Ford has plans to introduce battery-powered vehicles, hybrids and plug-in hybrids to market in the next four years.

Honda's advanced fuel cell electric vehicles have been tested and proven through a series of successful partnerships over the last seven years with various fleet users and retail customers. Honda's FCX Clarity has a range of up to 240 miles and its fuel efficiency is three times that of a comparable gasoline-powered vehicle.

The United Illuminating Company (UI) is committed to reducing the impact on global climate change. UI is collaborating on EV market development and issues crucial to emerging market models.

If 60% of U.S. light duty vehicles were powered by today's electric grid, greenhouse gas emissions from this sector would drop by one-third, the equivalent of taking 82 million cars off the road.

## Strengthen and expand upstream supply chain

- > Increase access to low cost capital for suppliers, including expanded bonding authority and tooling construction loans for U.S. facilities
- > Reduce unwarranted regulatory constraints on key material and component transportation
- > Provide analysis and education on potential and perceived component and materials constraints

## 3. Establish Coherent Regulatory Policies for Electric Drive Vehicles and Infrastructure

Multiple regulatory and standard-setting bodies are developing policies regarding electric drive, including vehicle efficiency metrics, charging and refueling equipment standards and metering and information management protocols. Federal and state regulatory requirements must advance coherent goals for safe, efficient, clean and ubiquitous electric drive transportation.

- > Coordinate regulatory approaches with electrification goals: Promote harmonization of technical standards, environmental valuation and safety requirements
- > Promote national standards for plug-in vehicles and recharging infrastructure through the National Institute of Standards and Technology and other federal standards organizations, including ensuring compatibility of connectors through standards (including requiring SAE/UL approval for Phase 1, 2, 3 connectors)
- > Establish accurate recognition of electric drive efficiency and emissions in regulatory processes, including the Environmental Protection Agency/NHTSA rulemaking on greenhouse gas emissions and vehicle efficiency process
- > Support ongoing and flexible state regulation on the issues of "portable billing" and "home billing", as a superior alternative to a national billing mechanism requirement
- > Support state regulation of utility rates to promote utility incentives for grid-connected transportation investments

Nissan has committed to making the Nissan LEAF zero-emission, all-electric vehicle commercially available in December 2010. Nissan will work with multiple cities, including San Francisco and Seattle, to promote and develop a vehicle-charging infrastructure, including home charging, as well as streamlining the process for installing charging equipment.

The currently high kilowatt-hour cost of lithium-ion batteries includes expensive raw materials and materials processing, the cost of cell and module packaging and manufacturing costs.

Advances in energy storage technologies are important for accelerating the electrification of the transportation sector.

As a research and development partner, the federal government is helping industry to address cost and technology barriers for batteries, including the impacts of low temperatures, abuse tolerance and battery life.

## Recognition in Carbon-Constraint Regimes

- > In the coming year, the Congress and the Administration will continue to debate how to address climate change and reduce greenhouse gas emissions. Increasing the efficiency and sustainability of the transportation sector is an indispensable part of that debate, as is the potential role of electric drive.
- > Any national effort to reduce greenhouse gas emissions, including cap and trade and credit/allowance allocation regimes, must acknowledge the importance of vehicle electrification and ensure appropriate valuation and recognition of electric drive benefits.

## Coordinate Grid-Connected Transportation with Smart Grid Development & Deployment

- > Reduce disincentives for utility investments in grid-connected transportation and related smart grid technologies
- > Support demonstration and deployment of utility-scale energy storage through transportation energy storage systems
- > Work with regulators to address potential Smart Grid issues impacting grid infrastructure upgrades, privacy, cyber security, connectivity and vehicle telematics

## 4. Accelerate Technology Breakthroughs

In combination with private sector efforts, federal research can speed the maturation of electric drive enabling technologies, bringing down costs and improving performance. The Departments of Energy and Transportation, and other federal agencies, are critical partners in technology development. A multi-year commitment to robust resources for research, development and demonstration of diverse electric drive technologies will accelerate technology advances and deployment, and bring us closer to achieving economy-wide adoption goals.

- > Support annual appropriations and long term authorizations for electric drive research, demonstration and deployment, including:
  - > Increased electric drive efforts across agencies, including the Departments of Transportation and Defense and
  - > Robust support for the Department of Energy's electric drive portfolio, including vehicles, batteries and energy storage programs and support for additional programs identified in EISA 07

Electricity typically costs less than gasoline or diesel fuels. If electricity costs \$0.08 per kilowatt-hour and gasoline costs \$2.77 per gallon, a plug-in hybrid vehicle could drive on electric power for 3 cents per mile in electric mode, compared with 13 cents per mile for a gasoline powered vehicle. Combined operation of the vehicle's hybrid and gas powertrains would result in a cost of just 6 to 8 cents per mile.

Heavy duty hybrid trucks can save 300 to 700 gallons of fuel annually, eliminate 100 tons of carbon dioxide produced over a typical truck's lifetime, cut soot emissions by 95% and reduce smog-causing emission by 25%.

The National Plug-in Vehicle Initiative (NPVI), hosted by EDTA, will provide a web-based national clearinghouse for timely and accurate information on plug-in electric vehicles for the public, policymakers and regulators, first responders and associated industries. The NPVI will also facilitate inter-industry and government cooperation to streamline the adoption of grid-connected vehicles.

- > Full funding for electric transportation demonstrations authorized in EISA Sec. 131, including light and heavy-duty BEV and PHEV demonstrations and deployment grants for non-road electric drive applications, as well as Section 641 Energy Storage Competitiveness programs; expanded electric drive systems and component research programs
- > Refining the Department of Energy's Fuel Cell Program goals with a focused effort to overcome remaining barriers to commercializing fuel cell technology for electric drive, including increased funding for research, development and infrastructure deployment programs in priority areas, and extension and full funding for authorized fuel cell vehicle market transformation programs
- > Providing meaningful funding for on-board smart charging and off-board hydrogen refueling infrastructure development
- > Coordinating grid-connected transportation in Smart Grid equipment, demonstration and deployment programs
- > Promoting development of off-road, rail and marine electric drive applications and establishing programs supporting their deployment

### 5. Promote Public and Private Outreach and Education to Increase Consumer Awareness

Commercial scale adoption of electric drive technologies will also require the acceptance of the public. Credible information about the benefits, safety and requirements of electric drive is crucial and must be widely available to consumers, businesses and state and local governments.

- > Consumers need to understand how electric drive vehicles will meet their demands for safety, durability, performance and sustainability
- > Energy providers need information to plan for the penetration of grid-connected vehicles and manage changing electricity demand
- > State and local governments need access to unbiased information on diverse electric drive applications and how to best to accelerate their adoption
- > For its part, EDTA is coordinating a stakeholder outreach effort, the National Plug-In Vehicle Initiative, to provide essential information on plug-in electric drive technology to consumers and public and private stakeholders, including outreach and information to state and local legislators, regulators, utilities on plug-in technologies, infrastructure impact and implementation strategies.
- > We are also educating the public and policymakers through our website, which is a portal to the most up-to-date industry information and analysis of electric drive technologies and their benefits.

**The Electric Drive Transportation Association (EDTA)** is the trade association representing battery, hybrid, plug-in hybrid and fuel cell electric drive technologies and infrastructure. EDTA conducts public policy advocacy, education, industry networking, and international conferences. EDTA's membership includes automotive and other equipment manufacturers, energy companies, technology developers, component suppliers, and government agencies.



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