

Vehicle & Systems Simulation & Testing

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Vehicle & Systems Simulation & Testing Missions



Focus Area activities provide direct and indirect support for evolution of high efficiency vehicles as real world product offerings

Component /Systems Evaluation

\$2.35m

- Virtual vehicle environment
- Energy management development/practices
- Systems benchmarking/evaluations

Lab & Field Evaluations

\$10.475m

Performance benchmarking

Accelerated reliability data

Modeling tool validation



Stakeholders & Partners \$20.5m

Industry Grant Recipients Original Équip. Manufacturers

Consumers & Fleet Owners VTP Sub Programs **DOE Programs**

Policy Makers

Modeling & Simulation \$4.575m

- Develop & use modeling tools
- Assess technology potential
- Component Interactions
- Goal setting for R&D



Vehicle Systems Optimization

\$3.82m

- •Reduce auxiliary and parasitic loads
- Enabling Technologies



PEV Codes & Standards

\$2.565m

- Standards Committee Participation
- Develop and Validate
- Technology Development



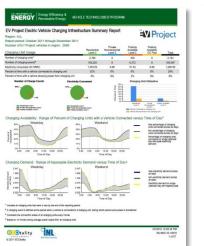


Recovery Act: Transportation Electrification Initiative



Largest U.S. Electric Vehicle & Infrastructure Deployment Ever

- Approximately \$400 million in federal funding to:
 - Automotive and Charging Industry
 - Educational Institutions
- Deploys over 20,000 charging stations to support 13,000 plug-in vehicles
 - Approximately 10,000 EVSEs and over 6100 vehicles as of April 30, 2012
- Collection of detailed data:
 - 113,000 PEV test miles, 4,430 charge events per day
 - LDV: http://avt.inl.gov/
 - M/HD: <u>www.nrel.gov/vehiclesandfuels/fleettest/</u>

























Vehicle & Systems Simulation & Testing Accomplishments

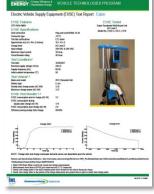


- Initiated data collection on thousands of vehicles and EVSEs deployed through Transportation Electrification:
 - 867,000 PHEV/EV charging events on 6,995 EVSE have used 6,500 MWh
 - 113,000 PHEV/EV miles and 4,430 charging events documented *per day*



- Expanded Advanced Vehicle Testing Activity (AVTA):
 - Shifted focus from HEV to PHEV/EV
 - 35.1 million PHEV/EV test miles accumulated on 7,952 Light Duty vehicles representing 91 different models to date
 - 3.4 million test miles accumulated on 95 different MD/HD HEV vehicles since 2006
 - Began testing under extreme thermal conditions
 - Evaluated EVSE hardware





- Deployed commercialized version of Autonomie vehicle modeling
 & simulation platform
 - Developed through CRADA between Argonne National Lab and General Motors
 - Distributed through LMS



Vehicle & Systems Simulation & Testing R&D Paths



FY 2012 Emphasis

- Support Electric Drive Vehicle (EDV) Market Transformation
 - Fund industry wireless charging RD&D
 - DE-FOA-0000667, "Wireless Charging for Electric Vehicles"
 - Issued 04/05/2012; Closes 05/31/2012
 - Fund Zero Emission Cargo Transport RD&D
 - DE-FOA-0000669, "Zero Emission Cargo Transport Demonstration"
 - Issued 03/20/2012; Closed 05/15/2012
 - Expand Evaluations for EDV AVTE & Transportation Electrification Recovery Act
 - Enhance component/system capabilities
 - Common platform for on-road evaluations
 - Climate extremes testing
 - HIL Studies of Advanced Powertrains
 - Expand EDV Codes & Standards to address key vehicle/infrastructure concerns
- Validate and enhance Autonomie models and capability



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