

DOD Plug-In Electric Vehicle Program



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DOD PEV Program



TASK --

- Increase number of PEVs (BEVs & PHEVs) in DOD's non-tactical fleet:
 - As much as possible;
 - As fast as possible;
 - Without significant additional cost to DOD fleets; and
 - With no adverse impact on mission operations.

Current Fleet Statistics



DOD Total # Non-Tactical Vehicles: 195,468*

Vehicle Type	% of Fleet	Ave. Annual Miles
LD Trucks	23%	7781
MD Trucks	21%	6394
Sedans	20%	11296
Pass Vans	16%	7883
HD Trucks	9%	3787

*Based on 2012 FAST Data ₃



Barriers to Adoption of PEVs

▶ Vehicle Acquisition Costs

- There is a minimal budget available for any vehicle purchases, and PEVs are difficult to cost justify given current budgetary constraints.
- GSA “incremental costs” for leasing PEVs place large capital cost requirements on federal fleets.
 - The “incremental cost” is the purchase price difference between a PEV and the lowest cost comparable alternative.
 - Federal fleets must pay GSA the incremental cost for each PEV prior to leasing.
- Commercial leasing results in poor lease terms that are 2-4 times higher than a comparable conventional vehicle.
 - Residual values are often minimized to the point of irrelevance.
 - Large leasing entities and OEMs often prefer to not do business directly with the Federal government.

▶ Infrastructure Costs

- There is no capital budget for the purchase or installation of charging stations.
 - Installation costs are by far the more problematic expense to overcome.

Strategies for Improving PEV Financial Outlook



1. High Volume Acquisitions in Targeted Fleet Segments
2. Targeted Regional Deployments
3. Battery Right-Sizing
4. Vehicle-to-Grid (V2G) Activities
5. Vehicle Financing
6. Strategic Planning of Charging Infrastructure



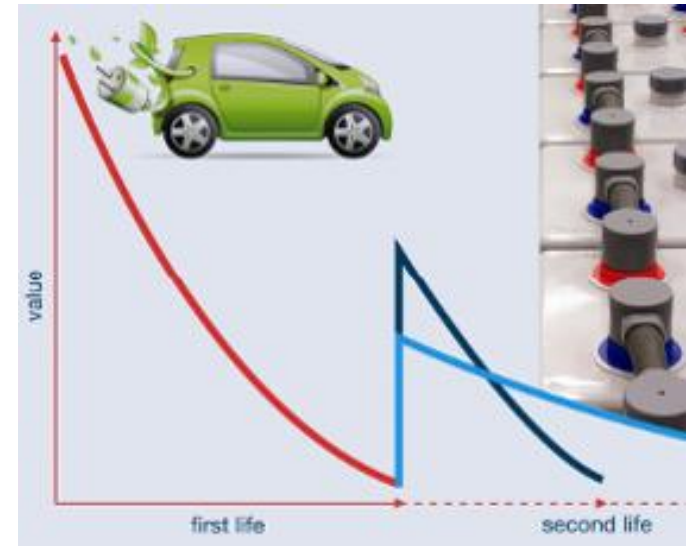
DOD V2G Project

- ▶ Initiate large-scale testing and evaluation program for PEVs on 6 installations (DOD-wide) in four regions, with the following features:
 - ~75 PEVs with V2G capability
 - LD pick-up trucks
 - LD cargo/passenger vans
 - MD/HD trucks and vans
 - Buses
 - One V2G-capable charging station per PEV
 - Specialized software to manage PEV fleet with V2G capability
 - Training for multiple DOD constituencies
 - Sustainment for PEVs, infrastructure, and software
 - Program management and systems integration
- ▶ Demonstrate financial and operational benefits of a V2G fleet
- ▶ Option to expand up to 1,500 PEVs on up to 30 installations



Recurrent Power

- ▶ PEV Battery Analysis Program
 - Evaluate the impact of V2G activities on battery health – relative to normal driving
 - Estimate the operational and financial value of second life V2G batteries over time
 - Identify optimal leasing terms for V2G vehicles based on potential second life values
 - Develop conceptual/prototype military applications for second life batteries
- ▶ All batteries in DOD V2G Project will be procured through Recurrent Power, in addition to laboratory-tested batteries
 - Goal is to lease the V2G PEVs while owning the battery
- ▶ Prototype second life system currently under development



Vector II



Objective: Conduct a targeted acquisition of PEVs and associated infrastructure across all states participating in California's Zero Emission Vehicle (ZEV) Program.

Scope: Replacement of ~1,400 DOD fleet sedans with PEVs each year within the 11 ZEV Program states

Status: Hosted industry event in November

CA Interest: Project would result in replacement of nearly every DOD sedan in CA with a PEV

Development of public charging stations in DOD communities

Reinforces objectives of CARB regulations

Look Ahead: Evaluating feasibility of achieving cost parity with ICE vehicles

Conclusion



- ▶ DOD is working to be a global leader in the development and use of PEV technologies.
- ▶ Current work in vehicle-to-grid (V2G) technologies is of major interest, but DOD will explore any opportunity to bring PEVs into its non-tactical fleet in cost effective manner.
- ▶ Vector II could potentially serve as a major milestone in PEV acquisitions and deployment.
- ▶ Input from industry and other interested parties is critical to determine if/how Vector II can be implemented.