2011 DOE Vehicle Technologies Program Review Presentation
Project ID: ARRAVT070

Interstate Grid Electrification Improvement Project

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This presentation does not contain any proprietary, confidential, or otherwise restricted information.

Overview

Timeline

- Begins May, 2011
- Ends May, 2014
- 60% Complete

Budget

- DOE Share $22.2 KK
- Match $29.7KK

Barriers

- No e-Infrastructure
- No on-board equipment
- No financing

▪Partners

- Trucking Companies
- Truck Stops
- Equipment Manufacturers
- Public Alliances
- National Labs and TRCs

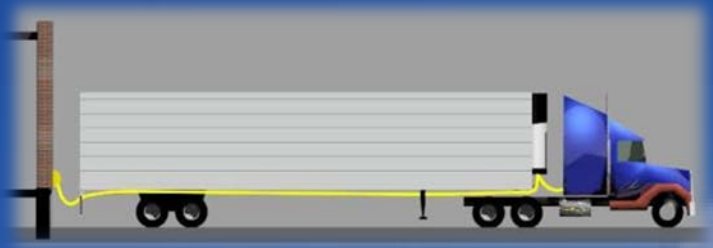
DOE Interstate Electric Improvement Project

Shorepower Truck
Electrification Project

Objectives of this Study

This project will accelerate the reduction of petroleum consumption and associated emissions and greenhouse gases by truckers. It will:

- Implement transportation electrification infrastructure at fifty (50) sites along major interstate corridors and
- Provide a 20% rebate incentive for battery operated and/or shore power enabled idle reduction equipment on 5,000 medium and heavy-duty trucks.



Objectives of this Study

Truckers cannot leave behind diesel until grid-power is easily available along routes and until e-powered equipment is standard on trucks.

Where a meaningful sample of the nations fleet becomes equipped with electrical equipment and demonstrates economic viability of electrical power over diesel fuel, then

- **Trucking fleets will require those technologies in new trucks**
- **Truck stops and docks will deploy necessary grid power along major corridors and truck layover sites**
- **An industry transformation will commence away from diesel to the grid**

Over Arching Project Goals

- ARRA Related Goals
  - Effect 500 full and part-time jobs
  - Demonstration of alternative energy source in transportation
- VT ARRA Project Goals
  - New grid technologies on trucks
  - Technology deployment at truck stops
  - Fuel savings of 8 million gallons per year
  - Careful analyze of utilization

ARRA and VT Project Goals

Year 1 Tasks:

Identify, finalize selection, and secure contracts to build (50) TSE sites.

Design and produce build plans for each TSE site.

Develop the marketing plan for and introduce the rebate program to the trucking industry.

Recruit truck owners and deploy half of the rebate incentives by 11/1/2011

ARRA and VT Project Goals

Year 2 Tasks:

Successfully complete fifty (50) TSE sites by 9/1/12

Mark each site opening with an event.

Successfully distribute all remaining rebates by 9/1/2012.

Begin site utilization and tracking by 9/1/2012

ARRA and VT Project Goals

Year 3 Tasks:

Monitor utilization of 5,000 trucks over Year 2013

Promote widely the successes of truck utilization and deployment of grid power for freight movement

Collaborate with grid power providers and highway planners to identify and remove obstacles for expansion of grid-access for truckers

ARRA and VT Project Goals

Year 4 Tasks:

In a final report, analyze utilization data for patterns of high use

Evaluate the economic viability of grid power according to routes, season, and transportation sectors

Evaluate technical successes that indicate strong opportunities for innovation

Estimate 5 and 10 year future growth potential of the technology

Technical Approach

- Recruit 50 participating truck stops. Install 25 connections per site. Select ones wanting project participation and located on major interstates and able to layover 200+ trucks
- Recruit owners of 5,000 long-haul heavy duty trucks seeking truck stop electrical power that run national routes, fully profile the participating trucks
- For each participating truck, monitor KWH and fuel use over study period by route, location, by day-time, by weather condition, and by type of on-board technology
- Interview selected populations where key trends develop

Project Status

As of April 1, 2012

- 4 year demonstration project (2 years deployment) into 2nd year
- Transformational technologies identified
- 50 sites across major US interstates selected
- 9 sites complete, 31 under construction
- 3500 “green” first-mover trucks recruited
- Data tracking system in design-testing
- Wide market promotion underway
- Study partners recruited for analysis phase work

Selected Technology Mix for Rebates

APUs w /SPC	1,320
Battery HVAC	2,234
Evaporative coolers	76
Engine heat recovery	—
Trailer cold plates	272
TRU w/electric standby	189
E-hybrid TRUs	645
Shore power kits	1300

The Interstate Routes

Site Locations

Private Partnerships

Equipment Alliances

Public Partners

Prospective Research and Industry Alliances

National Idle Reduction Technologies Association

North American Council for Freight Efficiency

Technology Maintenance Council of American Trucking Association

Transportation Research Board of the National Institute of Science

UC Berkeley Transportation Sustainability Research Center

American Trucking Research Institute, Washington D.C.

Southwest Region Universities Transportation Center, Texas A&M

Electric Power Research Institute

National Renewable Energy Laboratory

Argonne NATIONAL LABORATORY

United States Environmental Protection Agency

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WEST COAST COLLABORATIVE
A public-private partnership to reduce diesel emissions

Technical Accomplishments

- Advanced pedestal engineering for 120 volt, 240 volt and 460 volt system applications completed
- Truck on-board equipment technologies coordinated
- Internet based data and transaction support program established and activated
- Optimal sites located adjacent major interstate freight routes
- Installation design and construction 60% completed
- Site marketing and promotion underway

Summary

- Transformational anti-idling strategy toward grid power
- Fifty sites should grow to 250 sites by 2020
- 5,000 trucks should move to 100,000 trucks by 2020
- Annual diesel savings of 8,000,000 gallons in 2014 to move to 100,000,000 gallons per year by 2020

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