Interstate Grid Electrification Improvement Project

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Overview

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

Budget
- DOE Share $22.2 KK
- Match $29.7 KK

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 nation’s 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
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

- APU 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: 1,300
Private Partnerships

Equipment Alliances

- Thermo King
- Nite+ (A Division of Borgstrom Inc.)
- Carrier Transicold
- McMillan Electric Company
- Hodyon
- Centramatic
- Johnson Refrigerated Truck Bodies
- Hammond Air Conditioning Ltd.
- Dometic Group
- Comfort Cab
- Webasto
- Idle Free
- Power Tech
- Star Class Inc.
- Sleeping Well
- Clear Sky
- Impco
- Comfort Pro
- Diamond Power Systems
- Hercules
- Kidron
- Clima Cab
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

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

National Renewable Energy Laboratory

Argonne National Laboratory

United States Environmental Protection Agency

Proud Supporter of SmartWay
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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