INEEL-Based Office of FreedomCAR & Vehicle Technologies Program Activities

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Advanced Vehicle Testing Activity

IMEAC - Portland, Oregon
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Outline

- *INEEL Overview*
- *Energy Storage Technology Laboratory*
- *Heavy Vehicle Technology Support*
- *Advanced Vehicle Testing Activity (AVTA)*
- *Hydrogen/CNG Fueling Station*
- *Vehicle Testing*
- *Summary*

INEEL Overview

INEEL

- *890 Square mile U.S. Department of Energy Laboratory in eastern Idaho*
- *7,000 DOE and contractor employees*
- *1,600+ vehicles*
- *110 Light-duty CNG vehicles*
- *40 Light-duty LNG vehicles*
- *6 LNG motor coach buses*
- *5 Light-duty propane vehicles*
- *LNG/CNG station at “site” and CNG station 50+ miles distance in Idaho Falls*

INEEL

- *Upgrading Idaho Falls CNG dispenser to 3,600 psi*
- *Adding second 9 g.g.e. CNG tanks to 36 F250 pickups*
- *Replacing 4 g.g.e. 3,000 psi tanks on 13 Ford Contours with 7.2 g.g.e. 3,600 psi tanks*

INEEL Objective

- *Support DOE's efforts to reduce the nation's dependency on foreign oil:*
  - *Technology & Infrastructure Development*
    - *Increasing vehicle propulsion system efficiencies*
    - *Reducing or eliminating petroleum use*
    - *Enable regional integration of transportation, energy, facility, and information systems*
  - *Provide support to: DOE-EE&RE*
    - *FreedomCAR & Vehicle Technologies Program*
    - *Hydrogen, Fuel Cells, and Infrastructure Program*

Energy Storage Technology Laboratory

Energy Storage Technology Laboratory

- *Develop national standards and procedures for performance testing of EV and HEV batteries and ultracapacitors*
- *World leader in the testing of advanced battery technologies for automotive applications*
  - *INEEL procedures manuals used world wide*
  - *Developed standard data analysis procedures*
  - *Only national laboratory to document measurement uncertainty procedures for data quality*
- *Lead DOE lab for Hybrid Electric Vehicle battery testing*

Energy Storage Technology Laboratory

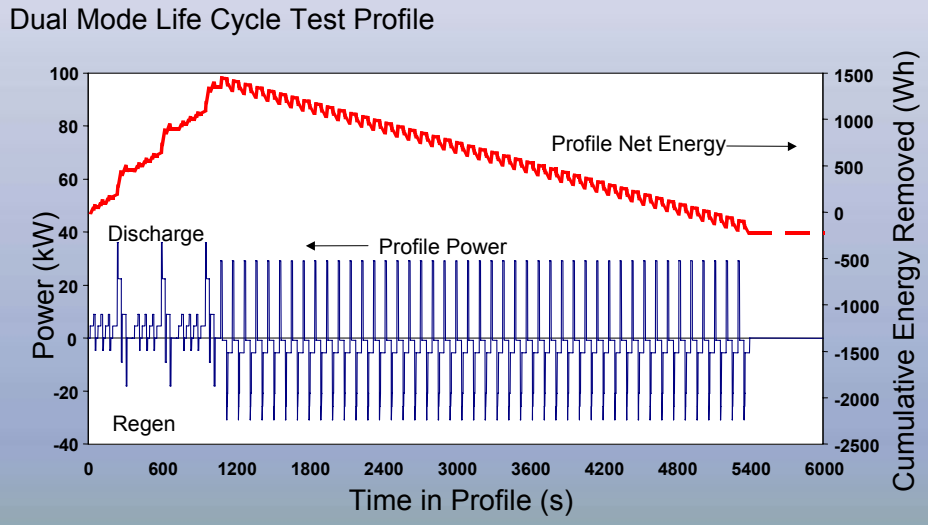
- *Advanced batteries and capacitors*
  - *Procedures development*
  - *Test and Evaluation*
  - *Data Analysis and Reporting*
  - *Development Tasks and Diagnostics*
  - *Program Management, Reporting*
  - *Modeling*
  - *Industry support*

Energy Storage Technology Laboratory

- *Tests small lab fixtures, full-size cells, modules, and battery packs ranging from a few mAh's to hundreds of Ah's and one volt up to hundreds of volts. Including:*
  - *lithium-ion*
  - *lithium-polymer*
  - *nickel metal-hydride*
  - *nickel cadmium*
  - *lead-acid*
  - *zinc-air*
  - *iron-air*
  - *sodium sulfur*
  - *sodium nickel chloride*

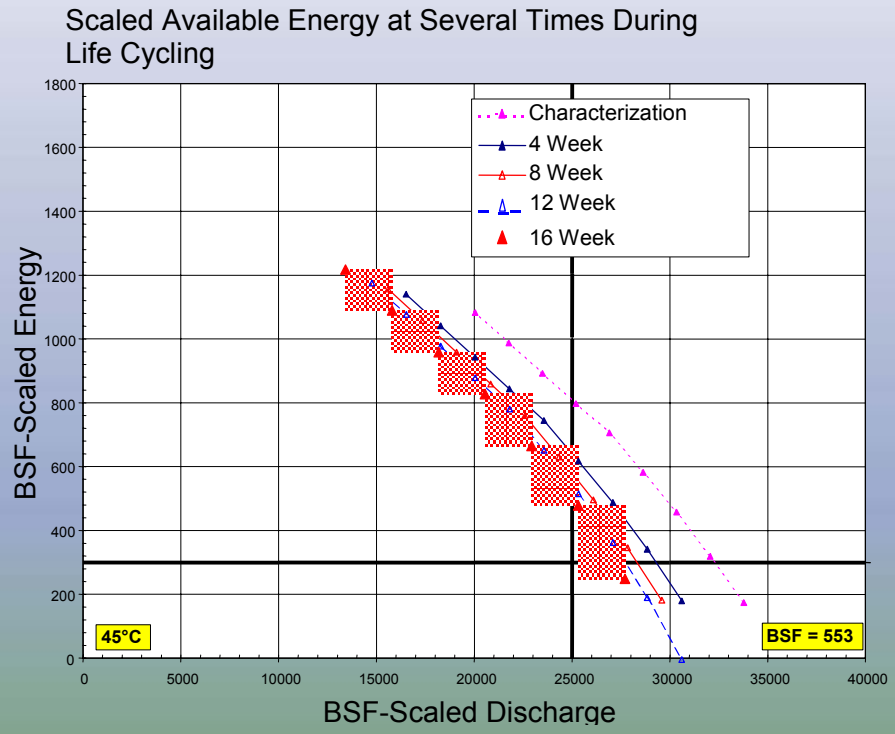
Energy Storage Test and Evaluation

- *The PNGV Battery Test Manual (now FreedomCAR Program) developed by INEEL is the industry standard for testing HEV batteries.*
- *Tests include:*
  - *Static capacity*
  - *Thermal performance*
  - *Self-Discharge*
  - *Cold-cranking power*
  - *Efficiency*
  - *Pulse power*
  - *Calendar life*
  - *Cycle life*



High Power Energy Storage Data Analysis

- *The INEEL has pioneered the development of analysis procedures for battery scaling, thermal management, capacity fade, and power fade.*



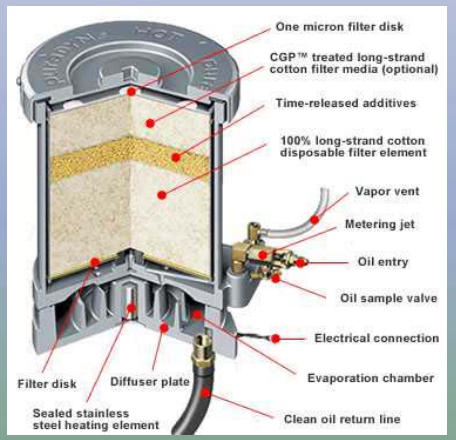
Heavy Vehicle Technology Support

Heavy Vehicle Technology Support, 21st Century Truck Program

- *Site Transportation Facility is a unique DOE facility fully equipped to support the development of advanced heavy truck and bus technology*

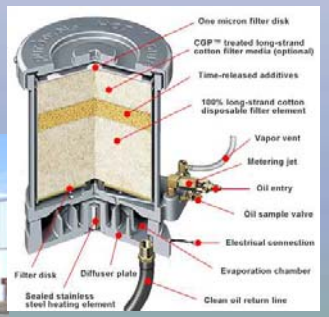
Oil Bypass System Performance Evaluation

- *Goal: Demonstrate & quantify engine oil use reductions*
  - *Phase 1: Demonstrate oil bypass filtration system (puraDYN)*
  - *Phase 2: Demonstrate light-duty vehicle operations*
  - *Phase 3: Economic benefits analysis by vehicle & fleets*
  - *Phase 4: Analysis and dissemination of DOE complex-wide economic and oil-use benefits*



Oil Bypass System Performance Evaluation

- *Evaluation Status – Phases 1 & 2*
  - *Systems installed on 8 of 99 INEEL motor coach buses*
  - *Ongoing bus operations and oil sampling*
  - *101,000 test miles on 8 buses (4/1/03)*
  - *Motor oil is sampled for 26 additives and contaminants*
  - *Systems being installed on 6 Chevrolet Tahoes*



Heavy Truck Idle Reduction Project

- *Goal: reduce 800+ million gallons of annual fuel use during idling periods*
- *Assess regional and national driver/truck idling needs and practices*
- *Assess idling technology options for heating, air conditioning, and auxiliary loads*
- *Match needs and technology capabilities*
- *Fleet/component demonstration/data collection project*
- *Results analysis and dissemination*
- *Solicitation being reviewed*

Advanced Vehicle Testing Activity (AVTA)

AVTA Goal

- *Provide fleet managers and other potential advanced technology vehicle (ATV) users with accurate and unbiased information on vehicle performance and infrastructure needs so they can make informed decisions about acquiring and operating ATVs*

- *AVTA is a DOE Activity within the FreedomCAR & Vehicle Technologies Program (Lee Slezak – DOE-HQ Manager)*

AVTA Testing Partners

- *Qualified Vehicle Testers*
  - *Electric Transportation Applications (lead)*
  - *Arizona Public Service*
  - *Bank One*
  - *Luke AFB*
  - *New York Power Authority*
  - *Red Cross*
  - *Southern California Edison*
  - *Salt River Project*
  - *City of Palm Springs*
  - *City of Palm Valley*
  - *City of Vacaville*