

Idaho National Laboratory Advanced Vehicle Testing Experience

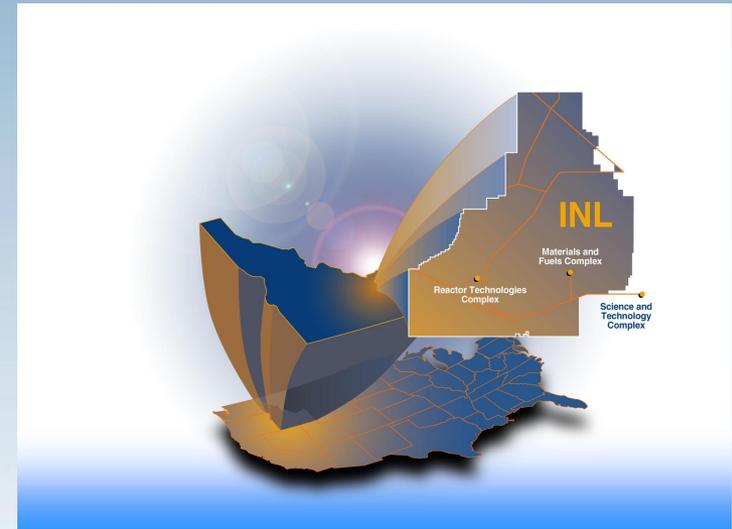


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May 7, 2007

Idaho National Laboratory

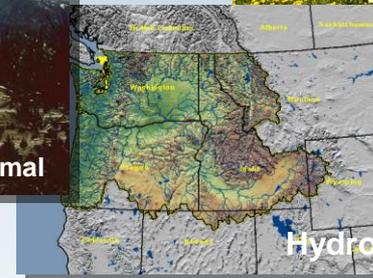
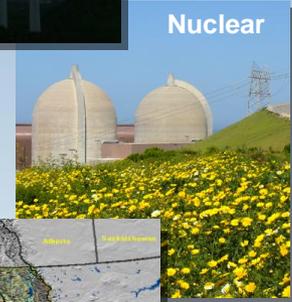
- INL is a Western DOE multi-program energy laboratory conducting RD&D to help “ensure the nation’s energy with safe, competitive and sustainable energy systems.....”
- INL leads at the intersection of science and operating systems, providing technological options and systems surety to accelerate commercial deployment of operating systems
- INL is helping the DOE implement its strategic goals nationally and regionally
 - Diversity of Supply and Use
 - Reduced Environmental Impact
 - Flexible, Reliable Energy Infrastructure
 - Greater Efficiency in End Use



INL Energy RD&D

Leading clean energy research

- Nuclear Energy:
- Fossil Energy
- Bioenergy:
- Windpower
- Geothermal Energy
- Hydropower
- Advanced Vehicles and Battery Development
- Energy and the Environment



INL Transportation Fuels RD&D

- Diesel reforming and hydrogen fuel cell technologies at laboratory & engineering scale
- Concept development and design of coal-to-liquids plants and components with commercial sponsors
- Biomass-Based Synthetic Fuels and Feedstocks
- Low-cost LNG liquefaction and fueling stations **2006 R&D 100 Award & Platts Global Energy Award**
- Xylanase (enzyme) based catalyst work **2006 R&D 100 Award**



ONR Diesel Reformer Pilot



LNG Refueling Station, Fresno

INL has initiated the Energy Security Initiative to address development of unconventional fuels



INL Vehicle and Battery RD&D

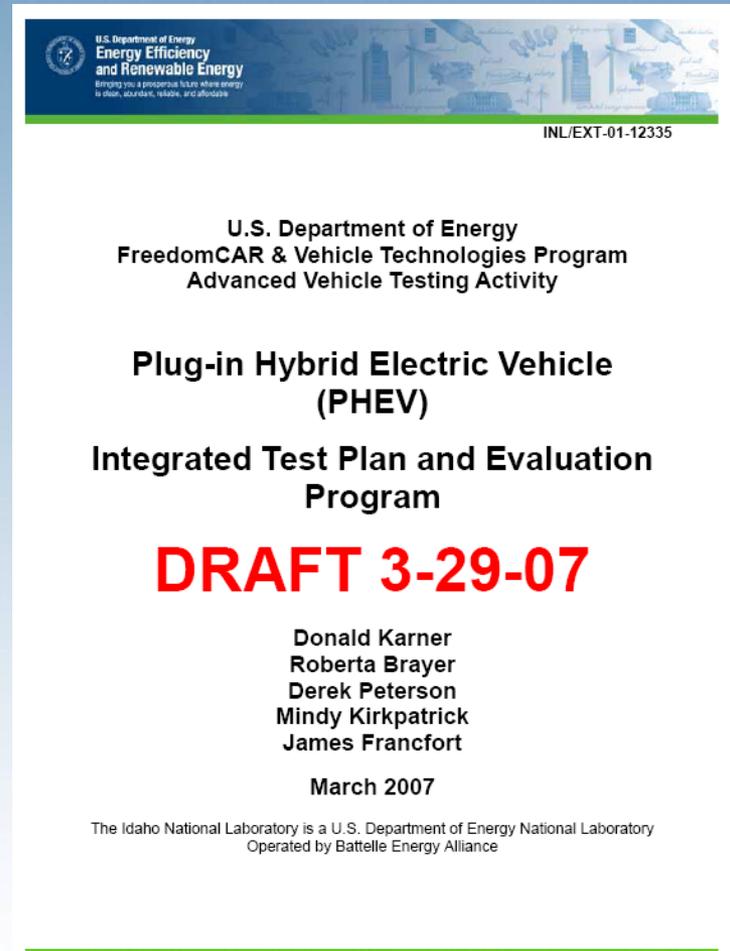
- INL is a leader in testing quality, associated with DOE EERE's Freedom Car Program
 - Battery development and testing
 - Electric and hybrid vehicle development and testing
- INL leadership as been built on data analysis testing rigor derived from experience in nuclear engineering research
- INL manages the road and fleet performance testing of PHEV's for DOE
- INL is working on several regional vehicle testing activities for States, and federal agencies (examples)
 - NYSERDA in New York for PHEV testing (for DOE).
 - Intelligent Transportation System for cross-border manufacturing at El Paso (for DOT)



**National Park
Service Yellow
Bus**

DOE PHEV Testing

- INL developed PHEV test plan which includes:
 - Baseline performance testing
 - Accelerated testing
 - Fleet testing
 - Power electronics
 - PHEV Grid activities
 - Vehicle energy storage
- INL developed PHEV test procedures
- Validated baseline performance test procedures using conversion PHEVS
 - EnergyCS Prius
 - Renault Kangoo
- Eventually test production PHEVs



The image shows the cover of a report titled "U.S. Department of Energy FreedomCAR & Vehicle Technologies Program Advanced Vehicle Testing Activity Plug-in Hybrid Electric Vehicle (PHEV) Integrated Test Plan and Evaluation Program". The cover features a blue header with the DOE logo and the text "U.S. Department of Energy Energy Efficiency and Renewable Energy" and "Empowering you a prosperous future where energy is clean, abundant, reliable, and affordable". The report ID "INL/EXT-01-12335" is in the top right. The title is centered in bold black text. Below the title, "DRAFT 3-29-07" is written in large red letters. The authors' names are listed below: Donald Karner, Roberta Brayer, Derek Peterson, Mindy Kirkpatrick, and James Francfort. The date "March 2007" is also present. At the bottom, it states "The Idaho National Laboratory is a U.S. Department of Energy National Laboratory Operated by Battelle Energy Alliance".

U.S. Department of Energy
Energy Efficiency
and Renewable Energy
Empowering you a prosperous future where energy
is clean, abundant, reliable, and affordable

INL/EXT-01-12335

U.S. Department of Energy
FreedomCAR & Vehicle Technologies Program
Advanced Vehicle Testing Activity

Plug-in Hybrid Electric Vehicle
(PHEV)

Integrated Test Plan and Evaluation
Program

DRAFT 3-29-07

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Derek Peterson
Mindy Kirkpatrick
James Francfort

March 2007

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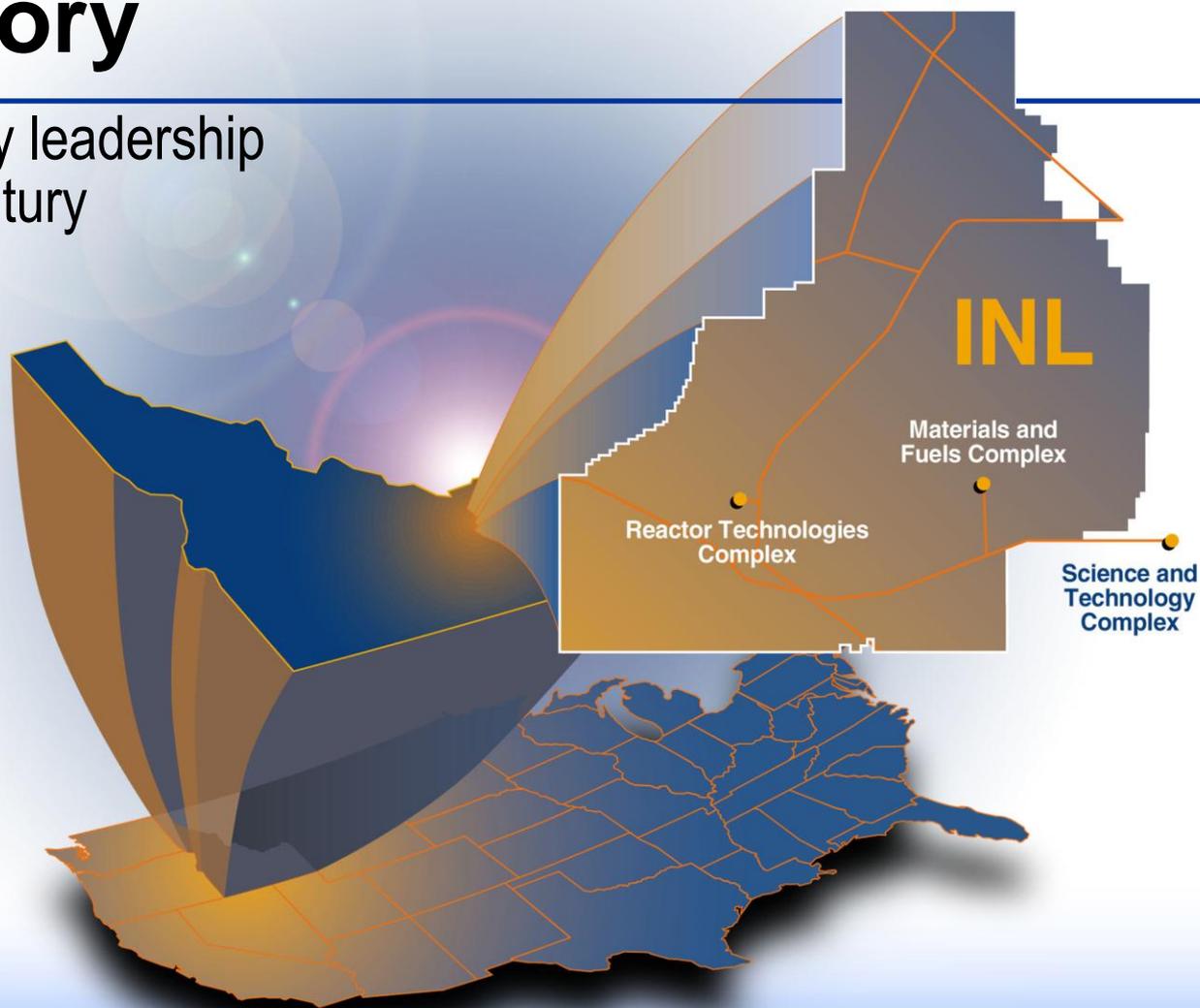
Northwest Pilot/Demonstration Project

- PHEVs can help decrease our nation's demand on fossil-based fuels, reduce emissions in congested areas and potentially reduce gridlock.
- Pilot projects are a critical step to accelerating PHEV commercial introduction.
- INL, as an independent, "honest broker" can support such a regional effort, assisting in:
 - Test design and technical coordination
 - Data analysis
 - Modeling



Idaho National Laboratory

Energy security leadership
for the 21st century

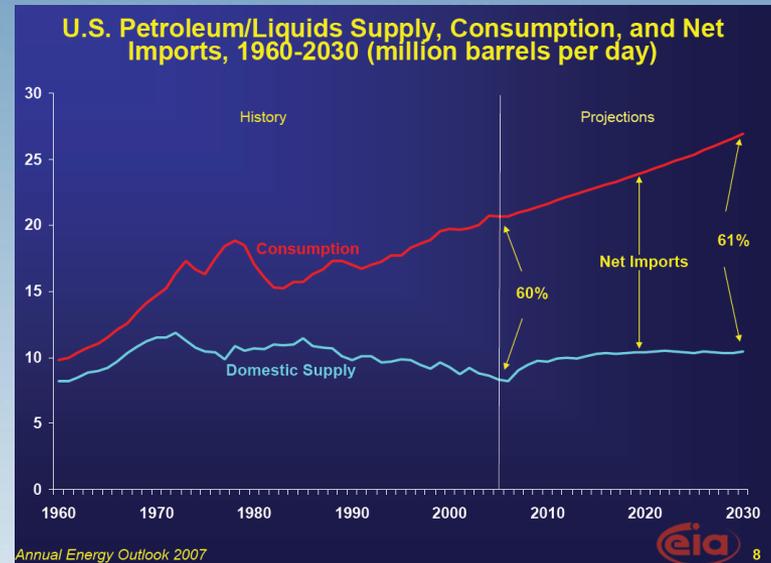


Backup



U.S. “Transportation Fuels” Situation

- U.S. faces serious challenges to energy security, especially associated with transportation fuels
- There is growing concern for our environment, which is inextricably connected to energy development and use.
- Critical to mitigating these challenges are innovative S&T breakthroughs and advanced science-based energy planning and policy solutions.
- Accelerating deployment of PHEVs will be an important part of the solution



A DOE Laboratory Working Group indicates that fuel switching & efficiency offer the best leverage in addressing this dynamic

Decreasing the demands on foreign oil imports by increasing PHEV use results in an increased demand on electricity

- Need for additional clean energy sources and energy infrastructure to deliver electricity
- INL is leading the revitalization of nuclear power and also supports clean coal technology RD&D

