Partnering with DOE’s National Laboratories on Locomotive Technologies R&D

Dr. James J. Eberhardt, Director
Office of Heavy Vehicle Technologies
U.S. Department of Energy

Presented at the
New York, NY
November 15, 2001

**OHVT Mission**
To conduct, in collaboration with our heavy vehicle industry partners and their suppliers, a customer-focused national program to research and develop technologies that will enable trucks and other heavy vehicles to be more energy efficient and able to use alternative fuels while simultaneously reducing emissions.
As technology becomes more complex and requires interdisciplinary mix of skills, partnering becomes more necessary to stay competitive.

Industries are partnering with each other:

- OEMs with suppliers

It also makes sense for U.S. businesses to partner with the U.S. government.
The Number of Public/Private Partnerships Are Increasing

Government-Industry 21st Century Truck Partnership

PNGV
PARTNERSHIP FOR A NEW GENERATION OF VEHICLES

USABC

Solid State Energy Conversion Alliance

SECA

Bioenergy Initiative

Clean Cities

California
DRIVING FOR THE FUTURE
DOE Labs/Industry R&D Partnerships

Enabling Legislation and Policy

- **Bayh-Dole Act of 1980**
  - Nonprofit GOCOs automatically awarded patent rights

- **Stevenson-Wydler Technology Innovation Act of 1980**
  - Established technology transfer as Federal laboratories’ mission and created ORTAs

- **National Cooperative Research Act of 1984**
  - Enabling cooperative industry R&D without anti-trust action

- **Federal Technology Transfer Act of 1986**
  - Enabled GOGO/industry CRADAs

---

GOCOs - Government-Owned, Contractor-Operated laboratories
GOGOs - Government-Owned, Government-Operated laboratories
ORTA - Office of Research and Technology Applications
CRADA - Cooperative R&D Agreement
DOE Labs/Industry R&D Partnerships

Enabling Legislation and Policy

- National Competitiveness Technology Transfer Act of 1989
  - Enabled GOCO/Industry CRADAs
  - Defined technology transfer as ancillary to DOE weapons program mission
- Executive Order 12591 of April 10, 1987
  - Required Federal agencies to assist private sector via transfer of technology from Federal laboratories
What DOE Has To Offer

◆ National Laboratory scientific expertise
  ➣ Unique research facilities (neutron residual stress measurement capabilities, engine combustion research facility, synchrotron, x-ray sources)

◆ Catalyze formation of unique teams
  ➣ Example: Industry team on casting of large vehicle components (Alcoa, CMI)
Network of DOE laboratories provides a national resource for new technologies that can be accessed through the Office of Research and Technology Applications (ORTA) at the laboratories.
U.S. industry and universities can access technology in the DOE laboratories through many different mechanisms.
To conduct, in collaboration with our heavy vehicle industry partners and their suppliers, a customer-focused national program to research and develop technologies that will enable trucks and other heavy vehicles to be more energy efficient and capable of using alternative fuels while simultaneously reducing emissions.
Gateway to Partnering on Heavy Vehicle Technologies R&D
DOE Labs/Industry R&D Partnerships

Partnering Mechanisms

- Cooperative Agreements
- Cost-Shared Contracts/Subcontracts
- Cooperative R&D Agreements (CRADAs)
- R&D Consortia
- Government R&D User Facilities
- Licensing
- Scientist and Engineer Exchanges
Industry/Government Partnership on Heavy Vehicle Engine R&D

Management Model: DOE Direct Contract Model

- Cost-shared contracts between DOE/OHVT and the diesel engine manufacturers
- DOE/OHVT provides program management, guidance, and customer coordination
- The unique capabilities of National laboratories provide supporting research
  - ORNL materials research and engine R&D
  - NREL alternative fuels
  - SNL combustion research
  - ANL systems analysis and modeling
- Setting up Executive Steering Committee to provide up-front input, and a National Academy Peer Review for program evaluation
- Interaction with other programs and agencies, e.g.:
  - DOE 2000 with OS and DP
  - Joint workshops with EPA
The President’s National Energy Policy

Specific DOE/EE-related recommendations:

- 4.2 – Evaluate EE Programs – propose appropriate funding for R&D programs that are performance-based and are modeled as public-private partnerships

- 4.3 – Promote Energy Efficiency

- 4.9 – Examine Transportation Efficiency

- 4.11 - Implement Tax Credit for Efficient Vehicles

- 4.12 – Utilize R&D Advances

- 4.13 – Reduce Truck Idling

- 4.14 – Improve U.S. Energy Intensity

- 8.1 - Prioritize Energy Security

- 8.24 – Promote International Markets for EE and Alternative Energy Technologies

- 8.25 – Address Climate Change Issues
Industry/Government Partnership

Summary

- Legislation and policy are in place to promote industry/government R&D partnerships.

- A variety of mechanisms are available for U.S. railroad industry to access DOE technologies.

- A possible model is proposed for an industry/government partnership on heavy vehicle engine R&D between the heavy vehicle industry and DOE/OHVT.