Technology Integration Overview –

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May 12, 2011

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

Activities

• Clean Cities – A voluntary, locally based government/industry partnership

• Legislative and Rulemaking

• Advanced Vehicle Competitions

• Education Programs
  • Graduate Automotive Technology Education
  • Partnership with Automotive X Prize
  • Advanced Electric Drive Vehicle Education Program
Deployment efforts accelerate market transformation by increasing public awareness & consumer acceptance/adoption of new vehicle technologies that are being developed through the Vehicle Technology Program’s (VTP) R&D activities.

Deployment programs are essential when the success of new technologies depends on consumers changing their driving and purchasing habits.

Primary Focus – Achieve Petroleum Reduction ...
by Implementing Next-Steps when R&D is completed

Roughly 10% of VTP base budget supports Deployment (Technology Introduction) efforts
Clean Cities
Portfolio of Technologies

**Alternative Fuels**
- Electric Vehicles
- Biodiesel
- Ethanol
- Hydrogen
- Propane
- Natural Gas

**Idle Reduction**
- Heavy-Duty Trucks
- School & Transit Buses
- Light-Duty Vehicles

**Fuel Economy**
More Fuel efficient vehicles, adopting smarter driving and vehicle purchasing habits

**Hybrids**
- Light- and heavy-duty
- Electric hybrids
- Plug-In hybrids
- Hydraulic hybrids

Replace
Reduce
Eliminate
Nearly 3 Billion Gallons of Petroleum Reduction since 1993

- Over 700,000 AFVs on the road
- 7000 alternative fueling stations (CC influenced >70% of them)
- Long term goal of 2.5B gal/year by 2020
Local Community/Coalition Support & Partnership Development: Direct support for CC activities, public events, training for Clean Cities coalitions & community leaders, local project coordination, strategic planning assistance

Consumer Information, Outreach, and Education: Fuel Economy Guide, Alternative Fuel and Advance Vehicles Data Center (AFDC), other web based consumer tools, publications, workshops, targeted workforce and end-user education

Technical & Problem Solving Assistance: Addressing Market Barriers, Safety Issues, Technology shortfalls

Financial Assistance: Funding to Facilitate Infrastructure Development and Vehicle Deployment projects (Competitive Awards)
Forming Local Community Partnerships: (Clean Cities Coalitions)

~100 coalitions Serving 78% of the US population

Thousands of stakeholders from businesses, city & state governments, transportation industry, community organizations, fuel providers
Expanding Partnerships with key stakeholders

National Clean Fleet Partners:
... deployment with hi-impact national fleets ...
Deployment Within National Parks

Photos courtesy of NPS
Clean Cities

Alt Fuel and Advanced Vehicle Data Center (AFDC)

FuelEconomy.gov
New Media to Reach a Wider Audience

Expanded Use of Social Media and Internet Based Communications

Venturing into Bi-Lingual messaging for popular tools and websites ...
DOE EERE Information Center and CC Technical Response Service

- Website: [http://www.eere.energy.gov/afdc/informationcenter.html](http://www.eere.energy.gov/afdc/informationcenter.html)
- Phone: 1-800-EERE-INF (1-877-337-3463)
- E-mail: technicalresponse@icfi.com
- Hours: 9:00 a.m. – 6:00 p.m. EST
Financial Assistance:
*Impact of ARRA & recent Clean Cities Awards …*

- Over 1,250 Alternative Fuel and Electric Charging Stations to be built or upgraded (includes 500+ EV charging stations)
- Over 10,000 Alternative Fuel and Advanced Technology Vehicles will be deployed
- ~ 40 Million gallons/yr of Petroleum Reduction
- Hundreds of workshops, educational events, workforce training and public outreach efforts
- Local Community & Economic Development
Budget History
(CC only - not including $300M funding from ARRA in FY09)

Clean Cities Budget

![Bar chart showing the budget history of Clean Cities from FY00 to FY12, with bars for Appropriation and Request. The chart highlights a significant increase in funding for FY11 and FY12 compared to previous years.](cleanCities.energy.gov)
Technology Integration Overview

Other Key Activities

- Advanced Vehicle Competitions
- Education Programs
  - Graduate Automotive Technology Education
  - Partnership with Automotive X Prize
  - Advanced Electric Drive Vehicle Education Program
Budget History
(continued – including other TI Activity areas)

- Adv. Veh. Competitions
- Graduate Automotive Technology Education
- Legislative & Rulemaking

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$40 million
Training the Next Generation of Engineers

Provide a new generation of engineers with knowledge and skills in developing and commercializing advanced automotive technologies.

Advanced Vehicle Competitions

• Since 1987, DOE has sponsored more than two dozen university-level advanced vehicle technology competitions.
• Provides college engineering students an opportunity to conduct hands-on research and development with leading-edge automotive propulsion, fuels, materials, and emissions control technologies.

• 16 Teams pursuing variety of advanced vehicle technologies
  • Extended Range Electric Vehicle – 7
  • Plug-In Hybrid Electric Vehicles (PHEV) – 6
  • Full Function Electric Vehicle (FFEV) – 1
  • Fuel Cell Plug-in Hybrid Electric Vehicle (FCPHV) – 2
• 3 year competition series concludes in June
  • Vehicle dynamic events – June 6-13
  • Static presentation events – June 14 & 15
  • Awards ceremony – June 16
Introducing EcoCAR 2

- EcoCAR2 launched at SAE World Congress 4/12-13
- Headline Sponsored by DOE and GM, Natural Resources Canada and other North American partners
- Teams will be challenged to reduce the environmental impact of a mid-size car while maintaining the performance and consumer acceptability of the production counterpart

Chevrolet Malibu
Training the Next Generation of Engineers

Graduate Automotive Technology Education

- Receive DOE funding for student fellowships and curriculum development.
- Each center has established a graduate engineering education program that offers courses emphasizing that center's technology specialty.

Solicitation Closed on April 18.

Eight Centers of Excellence Awarded in 2005

- University of California-Davis (fuel cell hybrids)
- Virginia Tech (fuel cell hybrids)
- Pennsylvania State University (energy storage)
- Ohio State University (HEV systems)
- University of Michigan-Dearborn (advanced materials)
- University of Tennessee (HEV systems)
- University of Illinois, Champaign-Urbana (biofuels/combustion)
- University of Alabama-Birmingham (advanced materials)
Automotive X Prize concludes

DOE sponsored the Evaluation, Education & Outreach Program to promote student/public interest and understanding of advanced automotive technology.

- Real-time, on-line availability of competition activities
- Educational events in 16 science centers around the country
- High school aged competition to design next-generation dashboards
- Vehicles tested on the track and dynamometer using consistent methodology.
- Fuelourfuturenow.com

Mainstream Edison2 “Very Light Car #98”

Alternative Li-ion Motors Corp “Wave II”

Alternative X-Tracer Team Switzerland “E-Tracer #79”
Accelerate the development and production of various electric drive vehicle systems through support of educational programs to substantially reduce petroleum consumption

- Engineering Degree & Certificate Programs
- Emergency Responder and Safety Training
- Consumer & K-12 Educational Outreach
- Developing and Providing Teaching Materials
- Training Service Personnel, Vehicle Mechanics, and Supporting Infrastructure
Advanced Electric Drive Vehicle Education Program

- Selections announced by President Obama on August 5, 2009.
- 10 projects receive $39.1 million in ARRA funding.
  - National Fire Protection Association
  - Missouri University of Science and Technology
  - Wayne State University
  - West Virginia University
  - University of Michigan
  - J. Sergeant Reynolds Community College
  - Michigan Technical University
  - Purdue University
  - City College of San Francisco
  - Colorado State University
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Legislative & Rulemaking

Vehicle Education

Clean Cities

U. S. Department of Energy
Session Instructions

- This is a review, not a conference.
- Presentations will begin precisely at the scheduled times.
- Talks will be 20 minutes and Q&A 10 minutes.
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- Reviewers should be seated in front of the room for convenient access by the microphone attendants during the Q&A.
- Please mute cell phones, Blackberries, etc.
Reviewer Reminders

• For Reviewers:
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  – ORISE personnel are available on site for assistance and to answer questions.