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
Clean Cities
A voluntary, locally-based government/industry partnership

**Mission:** To advance the energy, economic, and environmental security of the U.S. by supporting local decisions to adopt practices that contribute to the reduction of petroleum use in the transportation sector.

- Companion program to the EPACT mandates requiring certain fleets to acquire AFVs (Federal, State, and Fuel Provider Fleets)
- Deployment of alternative fuels and advanced vehicle technologies
- Funded and managed by DOE-HQ in Washington, DC. DOE Regional Project Management Centers (located in Pittsburgh, PA; Morgantown, VA, and Golden, CO) guide coalitions and manage projects.
Deployment efforts accelerate market transformation by increasing public awareness & consumer acceptance/adoption of new vehicle technologies that are being developed through 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 Coalitions

~100 coalitions Serving 78% of the population

> 5,700 stakeholders from businesses, city & state governments, transportation industry, community organizations, fuel providers
Deployment Efforts include 5 basic elements

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

2) **Local Community & Coalition Support:**
   Direct support for CC activities, public events, training for CC coalitions & key community decision makers, and deployment project coordination

3) **Partnership Development:**
   Targeted Industry, End-user, University, and Stakeholder Partnerships

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

5) **Financial Assistance:**
   Funding to Facilitate Infrastructure Development and Vehicle Deployment
Clean Cities
Portfolio of Technologies

Alternative Fuels
- Biodiesel (B100)
- Electricity
- Ethanol
- Hydrogen
- Propane
- Natural Gas

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

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

Fuel Economy
- More fuel-efficient vehicles, adopting smarter driving and vehicle purchasing habits
Clean Cities
AFDC
FuelEconomy.gov
Web Based and Mobile Versions of Powerful Clean Cities Tools

Access all of the tools and information at http://www.afdc.energy.gov/afdc/info_resources.html
Develop your expertise on Clean Cities tools, alternative fuels, and advanced vehicle technologies

Courses of Interest
FuelEconomy.gov Tools
Heavy-Duty Idle Reduction
GREET Fleet Footprint Calculator
Alternative Fueling Station Locator
TransAtlas Tool
Petroleum Reduction Planning Tool

http://ccu.westnetmlp.com/home
DOE EERE Information Center and CC Technical Response Service

- Website: 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
Clean Cities Gets Results!

**Displaced 2.4 Billion Gallons of Petroleum**
- > 2.4 billion GGE displaced by coalitions since 1993
- 580,000 new AFVs on the road
- Over 6000 alternative fueling stations (CC helped build >70% of them)

**Bottom line:** > 2 billion GGE displaced, best is yet to come
Partnered with National Media
• Collaboration with PBS-TV
• > 50 segments on alt fuels, advanced vehicles, fuel economy
• FuelEconomy.gov uses segments
• Enhanced CC legitimacy among automotive journalists

Leveraged Funding 25:1
• $43 million from Clean Cities
• Matched by $214 million
• Resultant partnerships brought in additional $845 million

Bottom line: Raised visibility of advanced transportation and energized funding

MotorWeek segments provided by Maryland Public Television

Car Keys - Fuel Sippers
Flash Video (14.7 MB)
Quicktime Movie (30.9 MB)
Text Version (pdf)

Big Green SUVs
Flash Video (8.5 MB)
Quicktime Movie (17.9 MB)
Text Version (pdf)

Best Eco-Friendly Award - GM Hybrid SUVs
Flash Video (3.4 MB)
Quicktime Movie (7.3 MB)
Text Version (pdf)
Budget History
(CC only - not including $300M funding from ARRA)

Clean Cities Budget

$ Millions

FY00  FY01  FY02  FY03  FY04  FY05  FY06  FY07  FY08  FY09  FY10  FY11

Appropriation

Request
Impact of ARRA & *new* Clean Cities Awards …

- Over 2000 Alternative Fuel and Electric Charging Stations to be built or upgraded (Infrastructure)
- 9000 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

*These projects will be summarized in more detail in subsequent presentations and at the poster sessions this evening ...*
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**
- **Adv. Electric Drive Veh. Ed. - ARRA**

- **FY 2007**
- **FY 2008**
- **FY 2009**
- **FY 2010**

$40 million

Millions

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<thead>
<tr>
<th>Activity Area</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009</th>
<th>FY 2010</th>
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<tr>
<td>Adv. Veh. Competitions</td>
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<td>Graduate Automotive Technology</td>
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<td>Legislative &amp; Rulemaking</td>
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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 North American universities are re-engineer a Saturn VUE to increase efficiency, reduce emissions and out perform its production counterpart while maintaining its consumer acceptability.

• 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
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.

<table>
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<th>Eight Centers of Excellence Awarded in 2005</th>
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<td>University of California-Davis (fuel cell hybrids)</td>
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<tr>
<td>Virginia Tech (fuel cell hybrids)</td>
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<tr>
<td>Pennsylvania State University (energy storage)</td>
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<tr>
<td>Ohio State University (HEV systems)</td>
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<td>University of Michigan-Dearborn (advanced materials)</td>
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<tr>
<td>University of Tennessee (HEV systems)</td>
</tr>
<tr>
<td>University of Illinois, Champaign-Urbana (biofuels/combustion)</td>
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<tr>
<td>University of Alabama-Birmingham (advanced materials)</td>
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Fuel our Future Now

- Partnered with the Automotive X Prize and Discovery Education
- Launched at the Washington DC Auto Show in February
- Curriculum available for K-12
  - Grades K-2: Vroom! Vroom! What Makes Cars Go?
  - Grades 3-5: Designed for Efficiency
  - Grades 6-8: Designing a Vehicle for the Year 2020
  - Grades 9-12: Transport to the Future: Making a Plan for Positive Change
Dash Plus project

High School competition to design dashboard of the future

Partnered with the Automotive X Prize and Discovery Education
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
• 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
Contact Information

www.vehicles.energy.gov

Legislative & Rulemaking

Vehicle Education

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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.

• Reviewers have priority for questions over the general audience.

• 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:
  – Please Observe Deadline for final submittal of review forms.
  – ORISE personnel are available on site for assistance and to answer questions.