-Technology Integration Overview –

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

Project ID: TI000

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
  - Advanced Electric Drive Vehicle Education Program

Clean Cities
U. S. Department of Energy

GATEWAY TO THE FUTURE
GATE
GRADUATE AUTOMOTIVE TECHNOLOGY EDUCATION

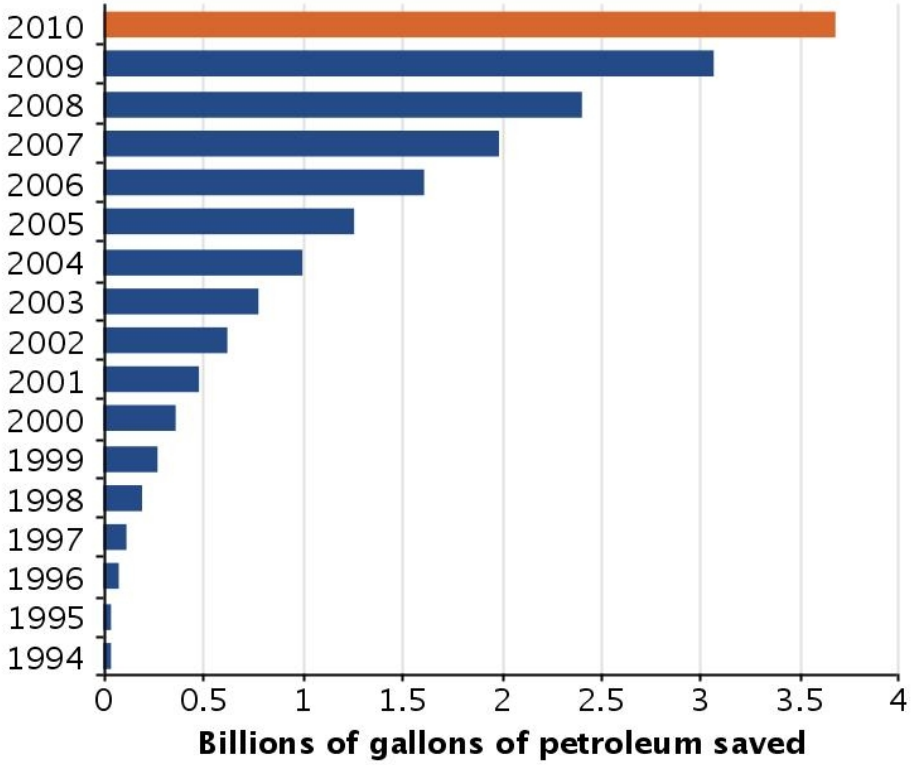
EcoCAR2
PLUGGING IN TO THE FUTURE

EcoCAR
The NeXt Challenge

Clean Cities Efforts Get Results !

Over 3.5 Billion Gallons of Petroleum Reduction since 1993

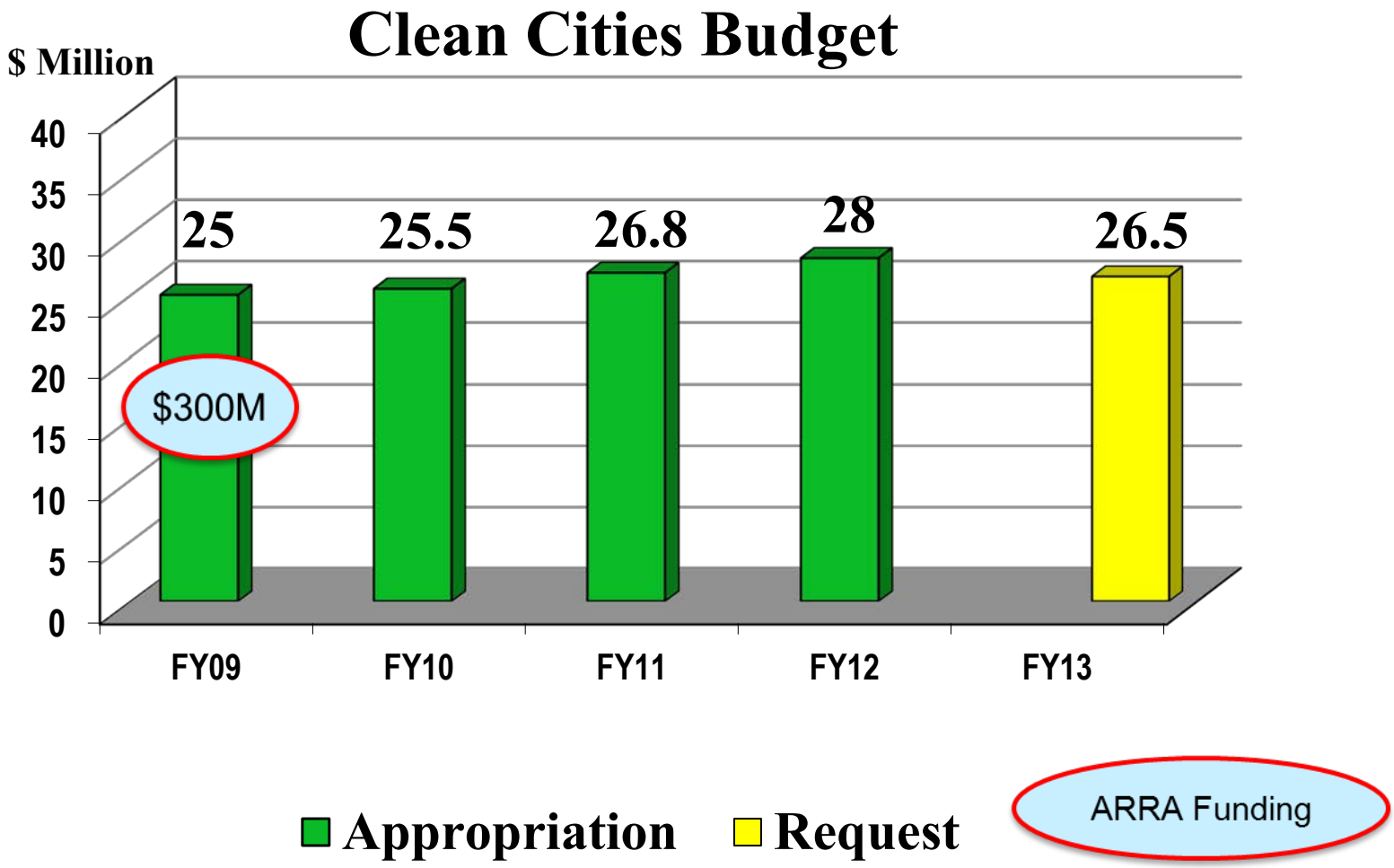
- Over 800,000 AFVs on the road
- 12,000 alternative fueling and charging stations (CC influenced >70%)
- Long term goal of 2.5B gal/year by 2020



Clean Cities

U. S. Department of Energy

Clean Cities Budget History



Local Coalition Support / Partnership Development

- *Coordination with key community and business leaders,*
- *Identification of potential fleet and funding partners*
- *Facilitating Infrastructure development projects,*
- *Collecting data and tracking progress*
- *Coalition technical training and strategy implementation,*
- *~100 coalitions serving 78% of the US population*

(photo courtesy of White House)

National Clean Fleet Partnership

April 2011 - President Announces Clean Fleets Partnership with 5 charter partners

(photo courtesy of White House)

- Challenge to top fleets across the country to adopt alt-fuels, advanced vehicles, petroleum reduction plans
- Pace-setters for others to follow

April 2012 –

Program grown To 20 National CF Partners

VEOLIA ENVIRONMENTAL SERVICES, Johnson Controls, BEST BUY, SYLVANIA, at&t, ups, PEPSICO, FedEx, ThyssenKrupp, Coca-Cola, verizon, Frito Lay, Schwan's, Ryder, GE, STAPLES, PG&E, ENTERPRISE HOLDINGS (Alamo, enterprise, National), ARAMARK, WM WASTE MANAGEMENT

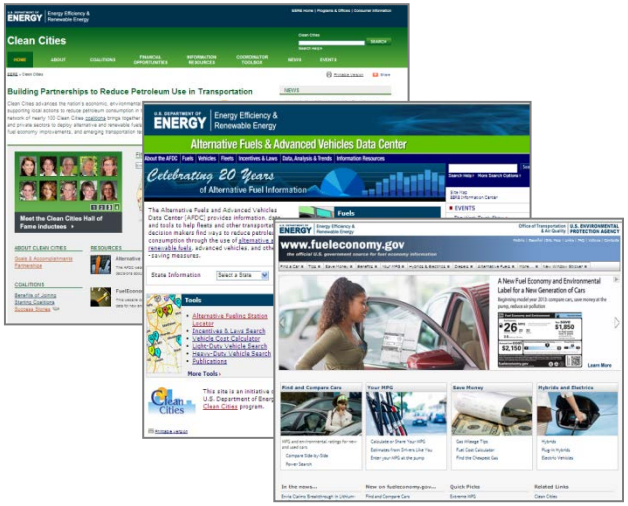
(logos used with permission of companies represented)

Direct Impact: The l00 largest commercial fleets account for more than 1 million vehicles. Every 2,000 vehicles converted to alternative fuel = 1M gal/year petroleum displacement.

Consumer Information, Outreach, and Education

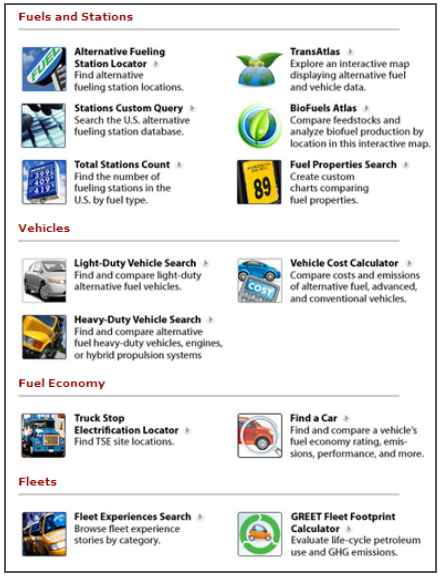
- *Non-biased source of VT data and information*
- *Fuel Economy Guide (FE.gov), Alt-Fuel Data Center (AFDC)*
- *On-line tools and cost calculators, other web resources*
- *Training for first responders and public safety officials*
- *Technical response service*
- *Public workshops, webinars, industry technical conferences*

Tech Bulletins



Websites

Technical Response Service



On-line Tools

Technical & Problem Solving Assistance

- *Address unforeseen permitting and safety issues,*
- *Identify chronic vehicle or infrastructure field problems*
- *Incident investigations (technology failures)*
- *Capture lessons learned and develop best practices*

Model EVSE Permit

Application for Installation of Electric Vehicle Charging Equipment

NOTICE: The system must be installed in compliance with the National Electric Code® NFPA 70, Article 625 Electric Vehicle Charging System or applicable electrical code currently adopted and enforced within the jurisdiction of installation. All associated work with circuits, electrical service and meters shall be completed in compliance with NFPA 70, national electric code, or applicable electrical code currently adopted and enforced within the jurisdiction of installation.

Section 1: Permit Applicant Information

Name:			
Installation Street Address (P.O. box not acceptable):	Contact Person:		Phone Number: ( ) -
City:	County:	State:	ZIP Code:
Owner Name:	Street Address:		Phone Number: ( ) -
City:	State:		ZIP Code:
Submitter's Name/Company	Street Address:		Phone Number: ( ) -
City:	State:		ZIP Code:
General description of equipment to be installed:			

Section 2: Permit Code Information

Requirements for wiring a charging station are taken directly out of the 2011 edition of the National Electrical Code® (NEC) NFPA 70, Article 625 Electric Vehicle Charging System. This article does not provide all of the information necessary for the installation of electric vehicle charging equipment. Please refer to the current edition of the electrical code adopted by the local jurisdiction for additional installation requirements. Reference to the 2011 NEC may be made at www.nfpa.org/70.

NEC® Chapter or Article	DESCRIPTION
Chapter 2 and 3	**Branch Circuit** A new electrical box added on a branch circuit shall comply with NFPA 70 National Electrical Code® Chapter 2 Wiring and Protection and Chapter 3 Wiring Methods and Materials and all administrative requirements of the NEC or the electrical code in effect in the jurisdiction
625.4	**VOLTAGES** Unless other Voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, and 600 Volts shall be used to supply equipment
625.5	**LISTED OR LABELED** All electrical materials, devices, fittings, and associated equipment shall be listed or labeled.

http://www.afdc.energy.gov/afdc/pdfs/EV_charging_template.pdf

(NREL stock photos)

Competitively-Awarded Financial Assistance:

Encourages private sector match and long-term investment

Recent Awards - helped deploy over 1,500 stations and 8,500 vehicles (projects being presented & reviewed at AMR this week)

Future Directions - Community Readiness, Barrier Reduction, and Sustainable Policy Development

- Local public-private partnerships will collaborate to develop strategies and local petroleum reduction policies to deploy alternative fuel vehicles and infrastructure, streamline permitting processes, and address critical barriers.

- Sep 2011 - 16 electric vehicle projects in 24 states totaling $8.5 million were announced (currently being implemented).

- May 2012 - $5M funding opportunity announced for community based “Implementation Initiatives to Advance Alternative Fuel Markets.” (**Closes Jun 18** -- awards anticipated in FY12-Q4).

Training the Next Generation of Engineers

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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

EcoCAR The NeXt Challenge

Secretary Chu at EcoCAR Finals

- Virginia Tech took top honors!

EcoCAR2 PLUGGING IN TO THE FUTURE

March 22, 2012
President Obama visits with Ohio State University EcoCAR2 Team after Energy Address

- Year One coming to a close….

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.
- **In 2011, 7 GATE Centers awarded - $6.4 million (DOE) over 5 years**
- Focus on three critical automotive technology areas: hybrid propulsion, energy storage, and lightweight materials.

Seven Centers of Excellence Awarded in 2011

- The Ohio State University - **Energy Storage and Hybrid Propulsion**
- University of Michigan, Dearborn - **Hybrid Propulsion**
- University of Colorado, Colorado Springs (UCCS) and the University of Colorado, Boulder (CU-Boulder) - **Energy Storage and Hybrid Propulsion**
- Purdue University -**Hybrid Propulsion with emphasis on Medium/Heavy Duty**
- Clemson University - **Hybrid Propulsion**
- Pennsylvania State University - **Energy Storage**
- University of Alabama, Birmingham - **Lightweight Materials**

Advanced Electric Drive Vehicle Education Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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

Contact Information

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

www.vehicles.energy.gov

Clean Cities
U. S. Department of Energy

Vehicle Education

Legislative & Rulemaking

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