



U.S. Department of Energy  
Energy Efficiency  
and Renewable Energy



# U.S. Department of Energy: State of Clean Cities Program Vehicle Technology Deployment Efforts

Mike Scarpino

National Energy Technology Laboratory  
Clean Cities Team Leader

February 28, 2008

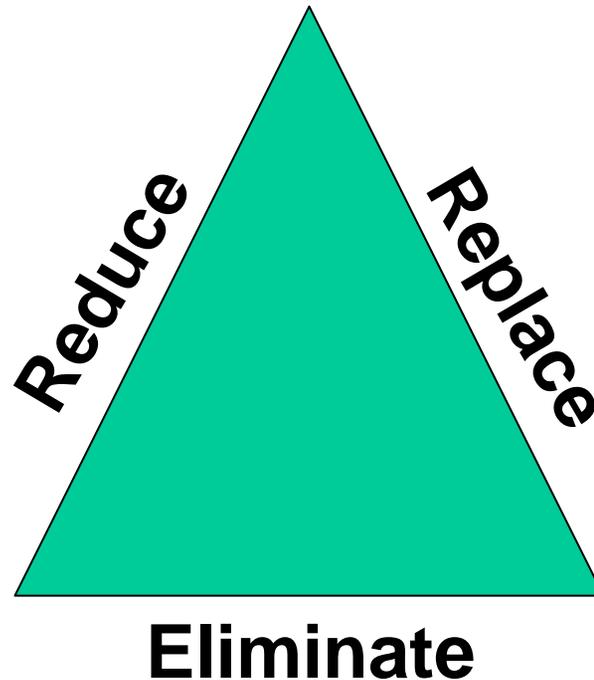


U.S. Department of Energy  
Energy Efficiency  
and Renewable Energy



# Goal: Petroleum Reduction

*How to Achieve the Goal ...*





# Clean Cities

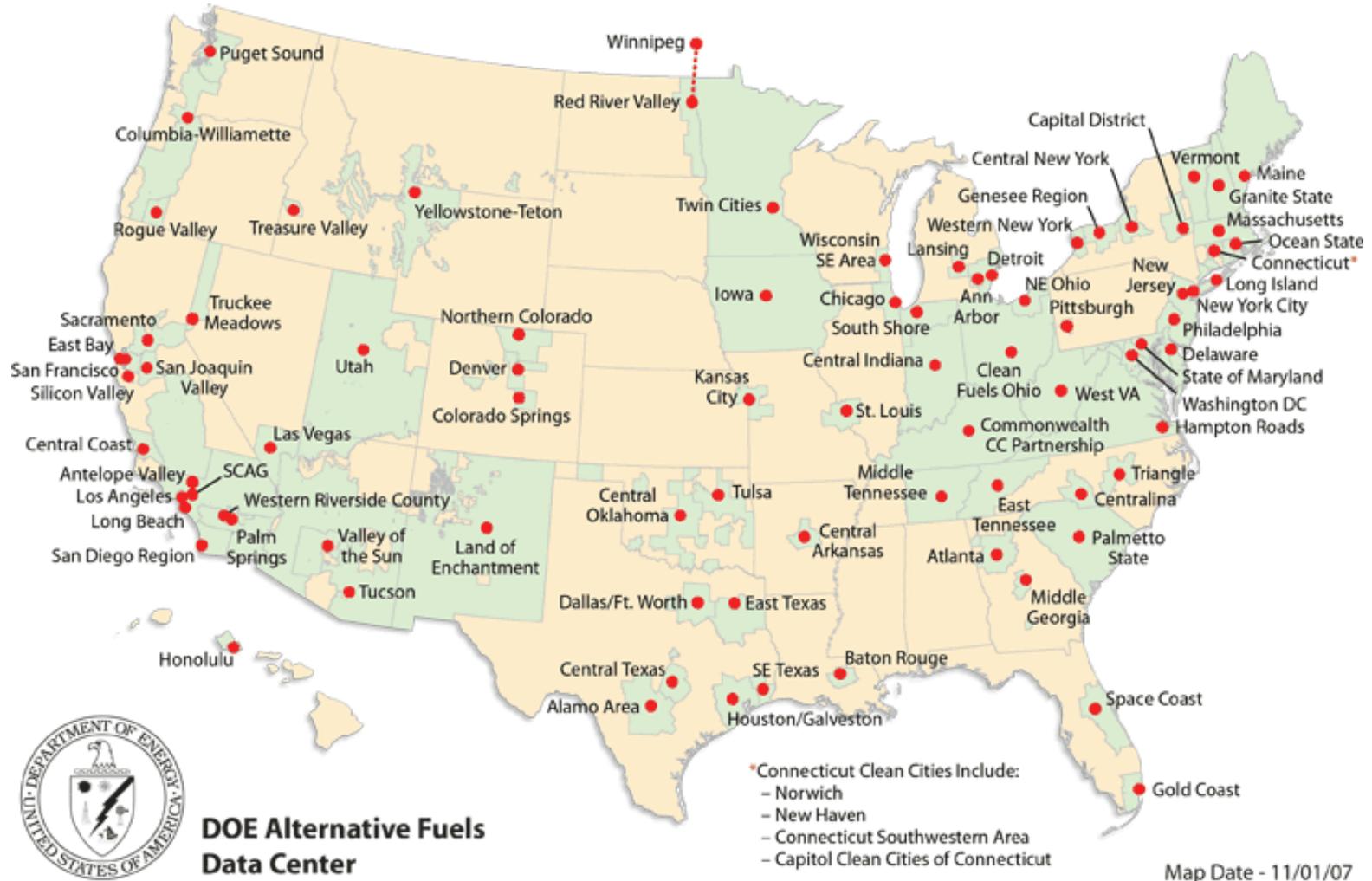
*A voluntary, locally-based government/industry partnership*

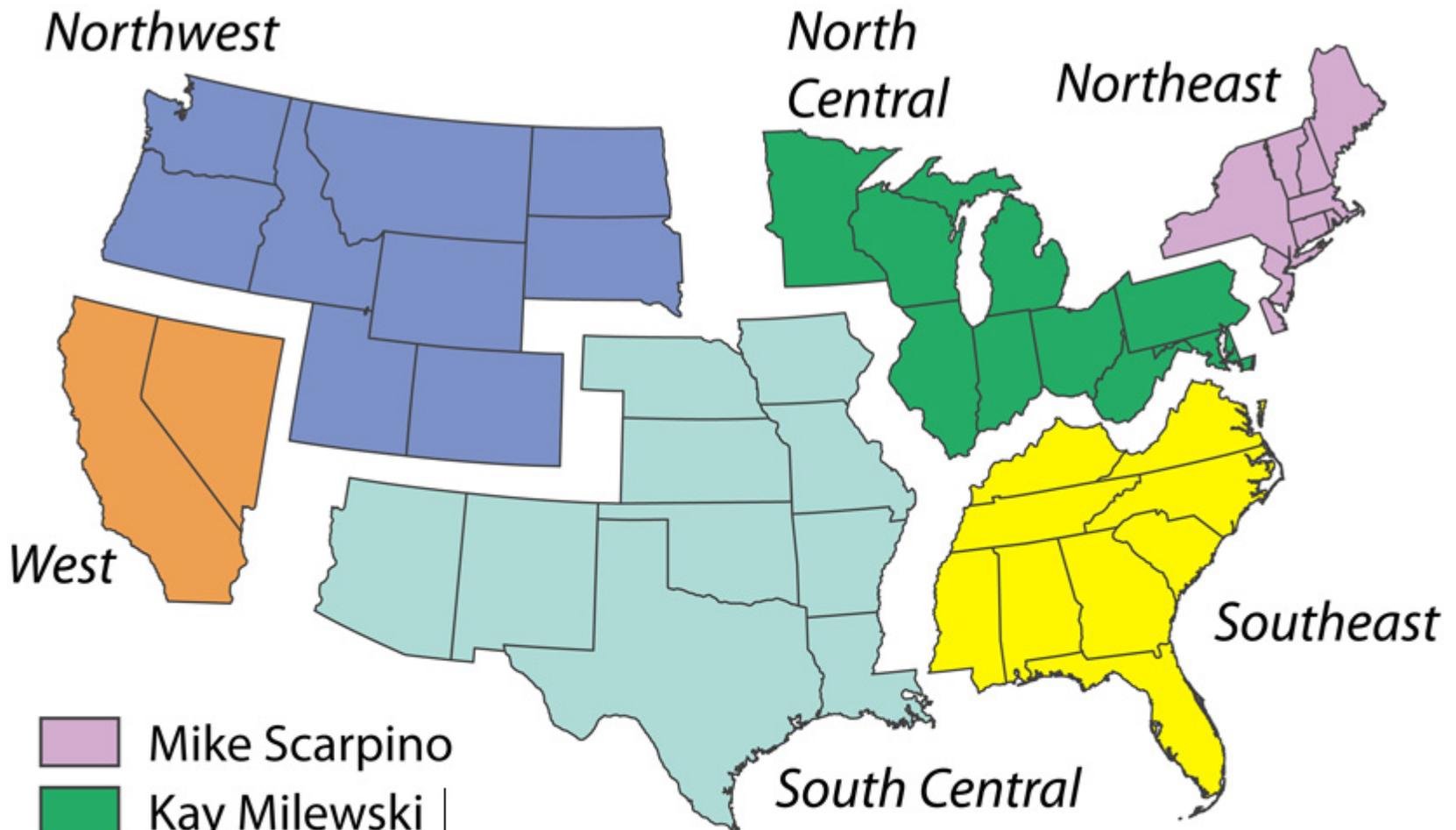
***Mission:*** To advance the energy, economic, and environmental security of the U.S. by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption in the transportation sector.

- Established in 1993 in response to the Energy Policy Act (EPAct) of 1992
- Companion program to the EPACT mandates requiring certain fleets to acquire AFVs (Federal, State, and Fuel provider fleets)



# Clean Cities Today: 85+ Active Coalitions in 45 States





- Mike Scarpino
- Kay Milewski |
- Steve Richardson
- Neil Kirschner
- Mike Bednarz
- Ernie Oakes

*Northeast -*  
Puerto Rico  
Virgin Is.

*Northwest -*  
Alaska

*West -*  
Hawaiian Is.  
Guam  
American Samoa  
Northern Mariana Is.



## National Laboratory Support

**National Renewable Energy Lab** (NREL – Colorado) – Clean Cities Core program technical support , AFDC, technical communications, publications, Clean Cities Web sites, Hotline Response Service

**Oak Ridge National Lab** (ORNL - Tennessee) – Federal Fuel Economy Guide, FuelEconomy.Gov websites, National Fuel Economy consumer education and outreach efforts

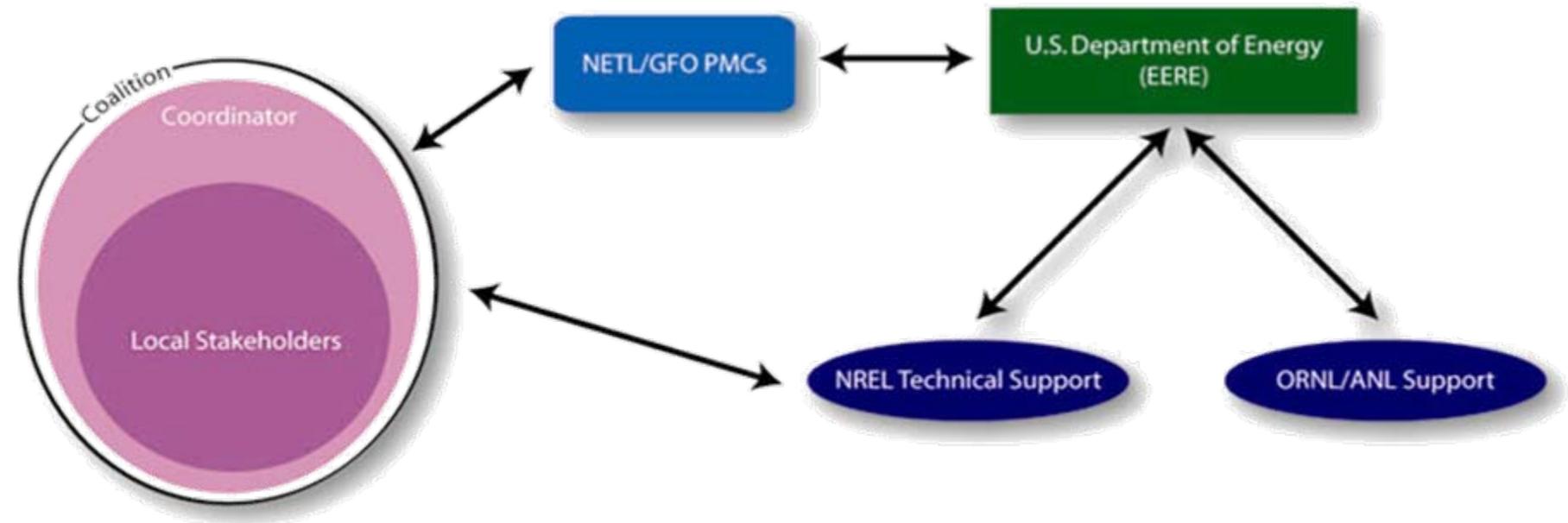
**Brookhaven National Lab** (BNL – New York) - BioMethane and Land fill gas recovery

**Argonne National Lab** (ANL – Illinois) - Emissions Modeling (GREET and AIRCRED) and Idle Reduction analysis

**National Energy Technology Lab** (NETL – Project Management and Regional coordination of key Clean Cities activities)



# Clean Cities Program Structure





## VT Deployment Focus Areas

1. **Accelerated Biofuels Initiative-** *Accelerate BioFuels Infrastructure Development Efforts, Consumer Outreach, and Technical Support Efforts.*
2. **Technology Deployment & Demonstrations-** *Niche Market Fleet, Adv Vehicle Demos (PHEVs, HD HEVs, FCVs, Clean diesel)*
3. **Consumer Information & Education-** *Fuel Economy.Gov (General outreach activities for consumers to make educated choices for new vehicle purchases)*
4. **Strengthening Coalitions-** *RDS contract, specialized training & workshops*
5. **Expanded National Partnerships-** *Work w/ Verizon, Enterprise, Kroger, etc.*
6. **Addressing Technical Barriers & Technical Assistance for Early Adopters-** *Coordinate specialized training and outreach to public safety officials, first responders, fleet maintenance personnel, etc. Distribute incident response procedures and guidelines. UL certifications. CNG Cylinder Program.*



# Clean Cities Technology Portfolio

## (Fuel/Technology Neutral Approach)

### Alternative Fuels

#### Increase vehicle & infrastructure

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

### Idle Reduction

#### Increase Technology Use/Practices

- Heavy-duty trucks
- Transit/School Buses
- Adoption of Idle Reduction policies and practices

### Blended Fuels

#### Increase Use of Blends

Low levels of alternative fuels with conventional fuels (B2, B5 and B20)

### Hybrids

#### Expanding Market for vehicles

Light- and heavy-duty hybrids

### Fuel Economy

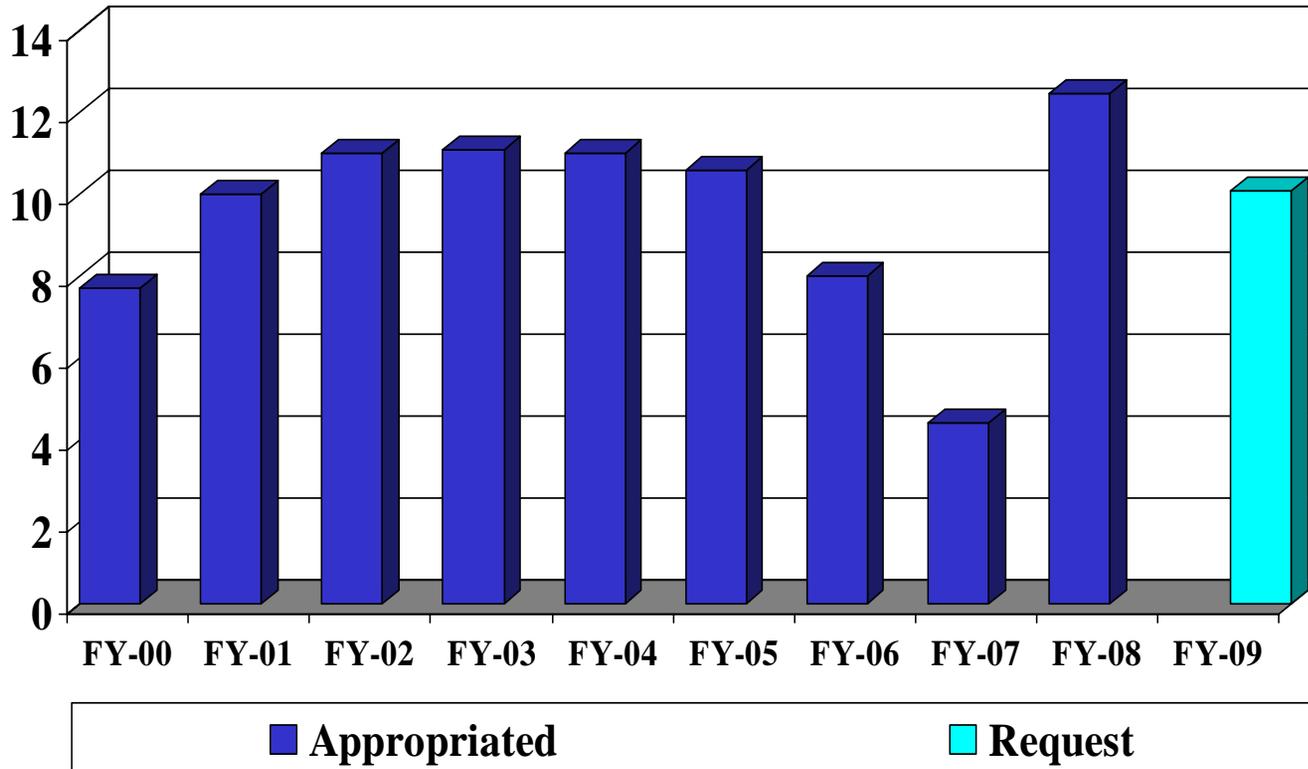
#### Increase fuel efficient technologies and practices

More Fuel-efficient vehicles, light weight materials, behavioral changes, vehicle maintenance initiatives, etc.



# *VT (Clean Cities) Deployment Budget*

\$ Millions





## *2006 Portfolio Performance*

- 2006 is the third year of the expanded Clean Cities portfolio and the online data reporting system
- Note: In 2005 the Clean Cities' annual fuel displacement potential was estimated to be roughly ***2.5 billion GGE per year in 2020***
- 2006 survey results exceeded goal for the year
  - Goal for 2006 was 292 million GGE displaced
  - Actually achieved 360 million GGE displaced through coalition and ORNL fuel economy efforts
- 83 coalitions submitted reports with an average of 3.5 million GGE displaced per coalition



## *2006 Petroleum Reduction Breakdown* *(in millions of GGEs)*

Technology	GGEs	Percentage of Total
AFVs	253	70%
HEVs	9	2%
Blends	10	3%
Fuel Economy	80	22%
Truck Electrification	8	2%
Total	360	100%

- **AFVs continue to account for lion's share of the displacement**
- **Fuel Economy is next, with significant potential for growth**

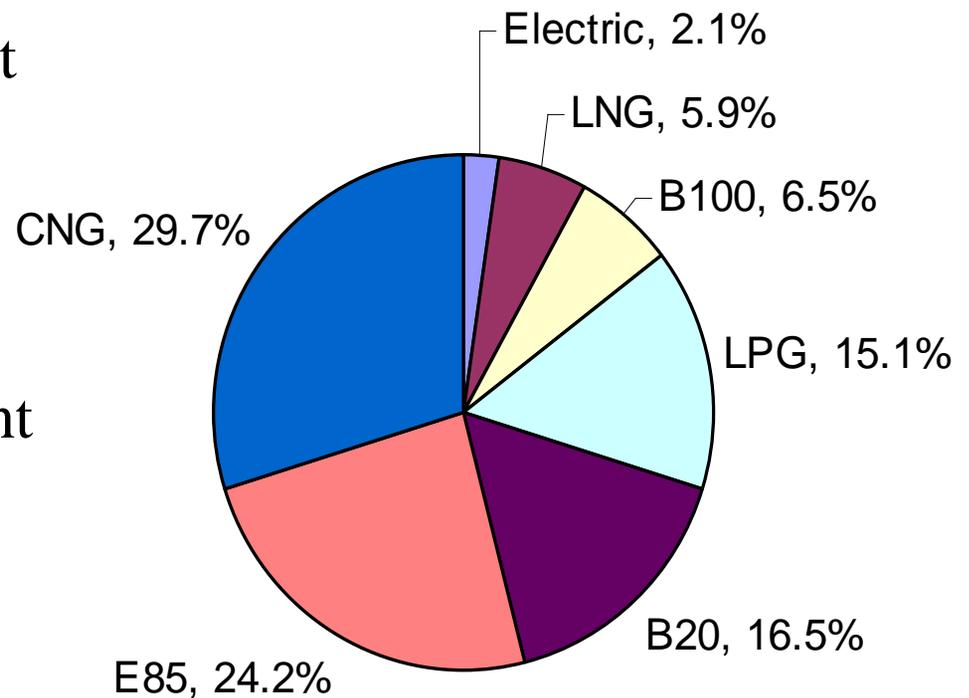
\*Data as of 9-19-07

*In 2004, Clean Cities Celebrated Beyond A Billion.  
The program should surpass 2 Billion in 2008*



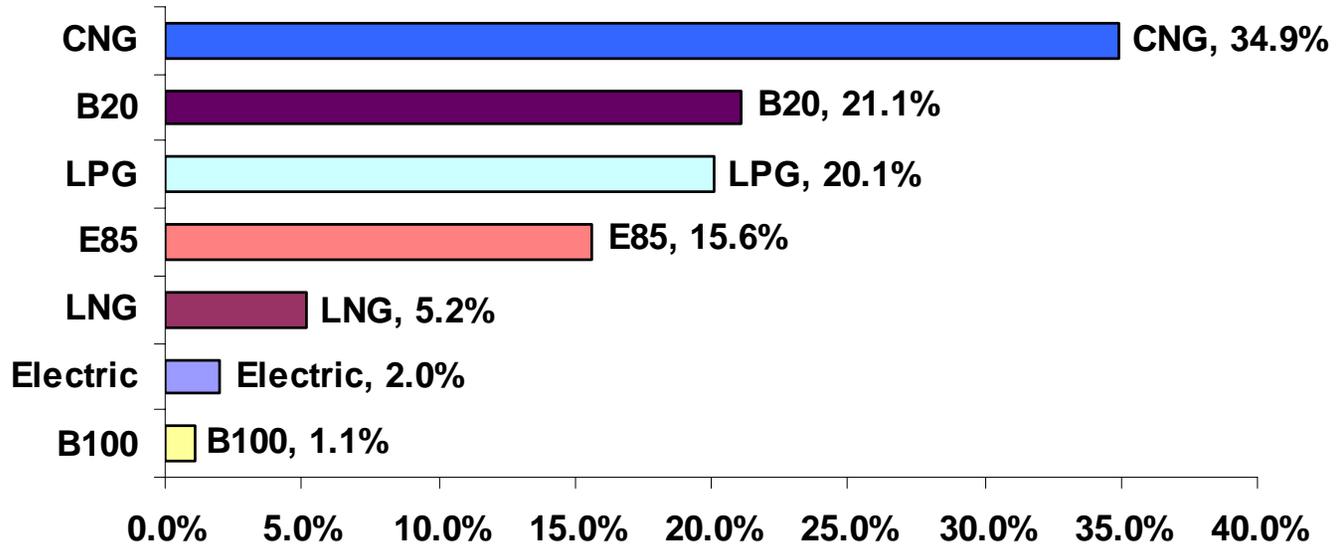
# Clean Cities and Alternative Fuels

- During 2006, Clean Cities efforts led to the displacement of 360 million gallons of petroleum
  - 50% increase from 2005
- Alternative fuels and AFVs represent 70% of displacement
  - Number of refueling stations offering E-85 doubled in 2006, and continues to increase
  - CNG contribution mainly from HD trucks and transit buses

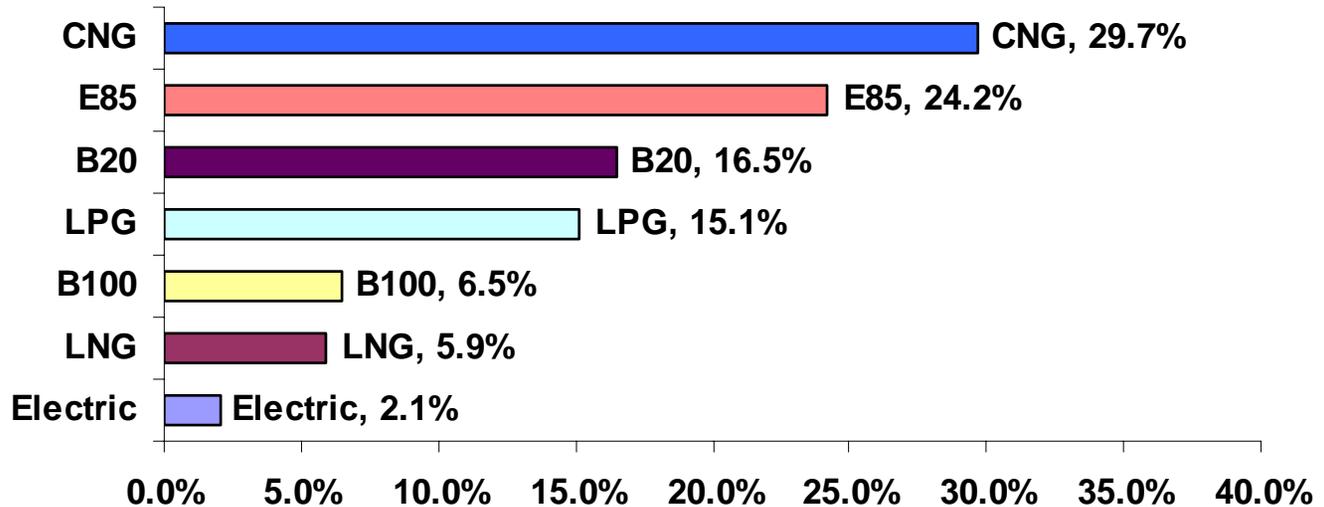


# AFV Petroleum Displacement Trends

2005



2006





# Top Performers in 2006

CATEGORY	COALITION	AMOUNT
Total - GGEs Displaced	St. Paul, MN	29,103,591 GGEs
AFVs - GGEs Displaced	St. Paul, MN	21,977,490 GGEs
HEVs - GGEs Displaced	St. Louis, MO	1,059,637 GGEs
Blends – GGEs Displaced	St. Paul, MN	7,122,691 GGEs
Fuel Economy – GGEs	Iowa	2,833,692 GGEs
Idle Reduction – GGEs	Los Angeles, CA	5,145,960 GGEs
Grants – Funding and Leveraged Funds	New Haven, CT	\$20,530,000
Leveraged Funds	New Haven, CT	\$7,430,000
Outreach – Most Persons Reached	Kansas City, KS	11,056,260
Outreach – Most Activities	Dallas-Fort Worth, TX	48
Total Stakeholders	Portland, OR	320
New Stakeholders	Winnipeg, CA	55



# Technology Demonstrations:

DOE is investing \$8.6 million (from 2006-2008) in cooperative agreements with Clean Cities Partners:

- E85 refueling projects in CA, OR, CO, IA, IN, KY, TN, AL, VA, MD, DC, NC, SC, GA and NY
- Ethanol, biodiesel, natural gas and propane infrastructure and vehicle acquisition.
- Partners are investing >\$16 million in these projects for a total of more than \$25 million





U.S. Department of Energy  
Energy Efficiency  
and Renewable Energy



# Consumer Information and Education

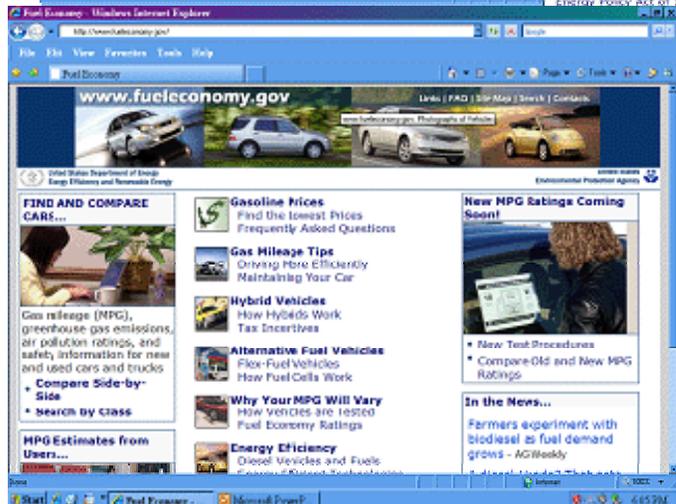
(tools & services)



# Clean Cities Website Tools



*Clean Cities*



*Fuel Economy – in partnership with EPA*



*AFDC*

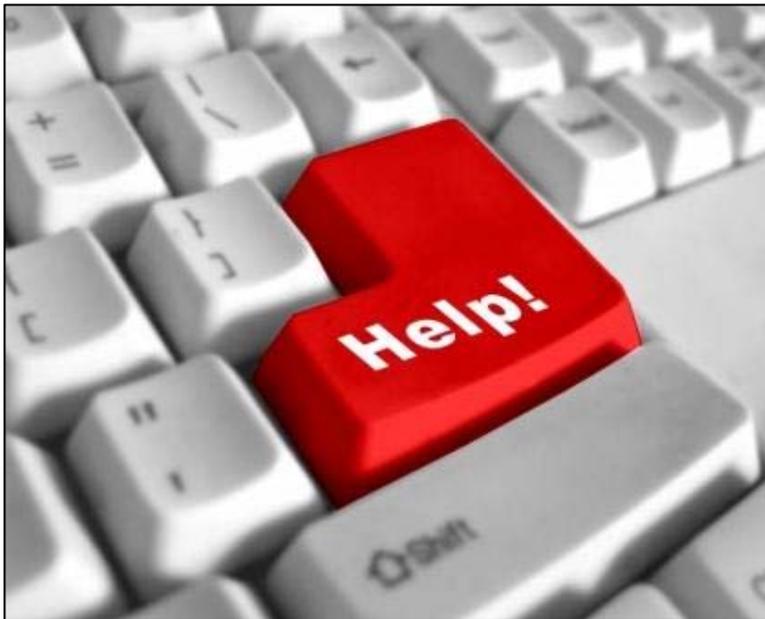


U.S. Department of Energy  
Energy Efficiency  
and Renewable Energy

Clean  
Cities

# Alternative Fuels Hotline

- 1-877-337-3463
- Available 9:00 a.m. – 6:00 p.m. EST
- [hotline@afdc.nrel.gov](mailto:hotline@afdc.nrel.gov)





United States Department of Energy  
Energy Efficiency and Renewable Energy

United States  
Environmental Protection Agency



FIND AND COMPARE CARS...



Gas mileage (MPG), greenhouse gas emissions, air pollution ratings, and safety information for new and used cars and trucks

- Compare Side-by-Side
- Search by Class

YOUR MPG ...



With 'Your MPG' you can:

- Calculate and Share 'Your MPG'
- View MPG Estimates from Drivers Like You



Videos

Extreme MPG  
Motorweek Videos



Gasoline Prices

Find the Lowest Prices  
Frequently Asked Questions



Gas Mileage Tips

Driving More Efficiently  
Maintaining Your Car



Hybrid Vehicles

How Hybrids Work  
Tax Incentives



Alternative Fuel Vehicles

Flex-Fuel Vehicles  
How Fuel Cells Work



New Fuel Economy Ratings

How Vehicles are Tested  
Your MPG Will Vary



Find Your Car's Energy Impact Score



Energy Efficiency

Diesel Vehicles and Fuels  
Energy Efficient Technologies



Why is fuel economy important?

Fuel Cost Calculator  
Strengthen National Security

fueleconomy.gov/m  
Find and Compare Cars on Your Mobile Device

In the News...

Americans fear \$4 gas - CNN

[Disclaimer](#)

[More News](#)

NEW MPG RATINGS FOR



We have revised the 1985 estimates to make them to EPA's new 2008 MPG r

- New 1985-2008 MPG
- Print the Fuel Econom

Gasoline - Ethanol Vehi

Find a Flex-Fuel V  
Where can I buy

www.fueleconomy.gov

model year **2008**

**Fuel Economy Guide**

	Self Serve	Cash or Credit
City	329 <sup>g</sup>	339 <sup>g</sup>
Highway	339 <sup>g</sup>	349 <sup>g</sup>
Combined		

EPA Fuel Economy Estimate

CITY MPG: 18

Highway MPG: 25

Combined MPG: 21

Estimated Annual Fuel Cost: \$1,200

See the 2008 Fuel Economy Guide for more information.

U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
U.S. Environmental Protection Agency

EPA  
EPCB 0901

# New Features

- Energy Impact Score

- Carbon Footprint

*(created to help emphasize the benefits of alternative fuels and petroleum reduction)*

U.S. Department of Energy | Print the Fuel Economy Guide | U.S. Environmental Protection Agency

**2007 Toyota Prius**

Find a Car

Compare Side-by-Side

Search by Class

Search by Make

Search by MPG

Cars that don't need gasoline

Best and Worst MPG

**Hybrid Vehicle**  
**Possible Tax Incentives**  
[Use Your Gas Prices & Annual Miles](#)

[Compare side-by-side](#)

**Estimated New EPA MPG**

REGULAR GASOLINE

48  
City

46  
Combined

45  
Hwy

**Official EPA Window Sticker MPG**

REGULAR GASOLINE

60  
City

55  
Combined

51  
Hwy

**MPG Estimates from Drivers Like You**  
Average based on 103 vehicles.

[Learn more about "Your MPG"](#)

46.6

Lo  
32

→

Hi  
77

View Individual Estimates

Disclaimer

**Fuel Economics**

**Cost to Drive 25 Miles** \$1.67

**Fuel to Drive 25 Miles** 0.54 gal

**Cost of a Fill-up** \$32.88

**Miles on a Tank** 493 miles

**Tank Size** 11.9 gal

**Annual Fuel Cost\*** \$999

Based on 45% highway, 55% city driving, 15000 annual miles and a fuel price of \$ 3.07 per gallon . Use Your Gas Prices & Annual Miles

**Energy Impact Score**

**Annual Petroleum Consumption** (1 barrel=42 gallons)

7.4 barrels/year

**Carbon Footprint**

**Annual Tons of CO<sub>2</sub> Emitted**

4.0

Personalize Annual Miles

3.5

16.2

# Fuel economy goes mobile at [fueleconomy.gov/m](http://fueleconomy.gov/m)

- New mobile site designed for access via PDA, cell phones, and other mobile devices
- Access fuel economy and related information at your convenience anywhere, anytime
- View
  - EPA mileage ratings for all cars and light trucks sold in the U.S. back to model year 1985
  - Annual fuel cost estimates
  - Annual petroleum use (barrels of domestic & imported petroleum)
  - Carbon footprint (tons of carbon dioxide emitted annually)



# FuelEconomy.gov/m at a glance

*fuel economy.gov/m*

2008 Ford F150 Pickup FFV 2WD  
Automatic 4-spd, 8 cyl, 5.4L

MPG	Gas/E85
City	13/10
Highway	18/13
Combined	15/11



#### Annual Fuel Cost

Gas - \$3,072  
E85 - \$3,272

#### Annual Petroleum Use



Gas - 22.8 barrels



E85 - 7.3 barrels

#### Carbon Footprint



Gas - 12.2 tons CO<sub>2</sub>/year



E85 - 10.1 tons CO<sub>2</sub>/year

*fuel economy.gov/m*

2008 Chevrolet Impala  
Automatic 4-spd, 6 cyl, 3.9L

MPG	Gas/E85
City	18/13
Highway	28/20
Combined	21/16



#### Annual Fuel Cost

Gas - \$2,192  
E85 - \$2,250

#### Annual Petroleum Use



Gas - 16.3 barrels



E85 - 5.0 barrels

#### Carbon Footprint



Gas - 8.7 tons CO<sub>2</sub>/year



E85 - 6.9 tons CO<sub>2</sub>/year



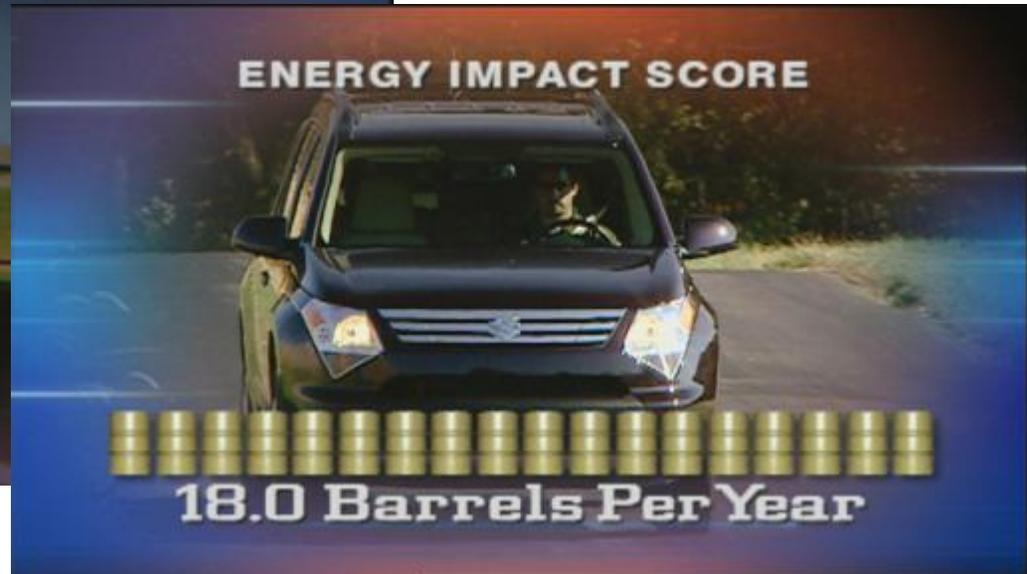
DOE Relationship with PBS since 2001  
*(airs weekly on PBS, SPEED, AF Network)*

Past Show Topics:

*(over 50 show topics featuring DOE focus areas)*

- BioTown USA
- Ethanol Goes Racing !
- Vehicle Road Tests with new emphasis  
on Fuel Economy and Energy Security
- Alternative Fuels Motor News

**Energy Impact Score:** MW incorporates a barrels-per-year “score” within the body of every new Road Test they produce, have refined how they incorporate this information, and added comparisons between E85 and gasoline when available.





**QUESTIONS  
&  
DISCUSSION**



U.S. Department of Energy  
Energy Efficiency  
and Renewable Energy



## Contact Information:

### **Mike Scarpino**

U.S. Department of Energy

National Energy Technology Laboratory

Office: 412-386-4726

E-mail: [michael.scarpino@netl.doe.gov](mailto:michael.scarpino@netl.doe.gov)

Website: [www.eere.energy.gov/cleancities/](http://www.eere.energy.gov/cleancities/)

Clean Cities Hotline: 1-800-CCITIES