



U.S. Department of Energy
Energy Efficiency
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Clean Cities: DOE HQ Perspective

Linda Bluestein

*Northwest and South Central Regional
Clean Cities Peer Exchange*

Santa Fe, NM

U.S. Department of Energy

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OUTLINE

- **News from D.C.**
 - **Staff**
 - **New Initiatives**
- **Budget News**
- **EISA and Tax Incentives**
- **Funding/Grant Opportunities**
- **Coalition News**
- **Tools**



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- **New Co-Director DOE Clean Cities**
 - **Managed DOE Fleet Regulatory Programs for States and Fuel Providers including writing rules, implementation, enforcement, compliance: 7 years**
 - **Small business contractor to DOE for 4 years (Chicago Regional Clean Cities; Headquarters)**
 - **Worked with NREL to start Alternative Fuels Hotline, worked with Alternative Fuels Data Center, first three National Clean Cities Conferences, Alternative Fuels CD-ROM with James Madison University**
 - **Consultant on oxygenated fuels, blends and reformulated gasoline (late 1980's to early 1990's)**
 - **University of Illinois, Champaign-Urbana, IL; Accepted into Georgetown University Legislative Studies Program**
 - **Hobbies: weekends at the swamp; oil pastels; shower opera**



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- **Phasing in the following:**
 - **More interaction with technology managers developing VTP technologies and deployment opportunities (kickoff May 20)**
 - **More interaction between Clean Cities and states (information sharing; education)**
 - **More interaction with other technology programs (biomass and hydrogen)**
 - **Increased program visibility/help coalitions increase their visibility**
 - **National Clean Cities Partnerships**



Vehicle Technologies - Diverse Portfolio of Clean, Efficient Technologies

Vehicle Systems

- Aerodynamics
- Rolling Resistance
- Accessory Loads
- Systems Analysis and Target Setting



Tech Introduction

- EPA Act
- Legislative & Rulemaking
- Clean Cities
- Validation
- Student Competitions
- GATE

Hybrid Propulsion

- Hybrid Electric Systems
- Power Electronics
- Advanced Batteries
- Inverters/Controllers
- Motors

Advanced Combustion Engines

- Low Temp. Combustion R&D
- Emission Controls
- Light- & Heavy-Duty Engines
- Waste Heat Recovery
- Health Impacts

Fuels Technologies

- Bio-Based Fuels
- HCCI Fuel Characteristics
- Fischer-Tropsch Fuels & Blendstocks
- Advanced Lubricants

Materials Technologies

- Lightweight Structures
- Metal Processing
- Composite Development
- Processing and Manufacturing
- Design Data Test Methods
- Recycling Technology
- HTML



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VTP Emphasis Going Forward

- **Performing the R&D associated with [Plug-In Hybrid Electric Vehicle](#) systems and components to support their demonstration and deployment**
- [Energy Storage R&D](#)
- **Conducting the R&D and deployment activities necessary to ensure that the increased amounts of [renewable fuels](#) under the expanded RFS can be used when they hit the market**
- **Deployment of [Advanced Technologies](#) – including [light-duty diesel](#) education and outreach activities**



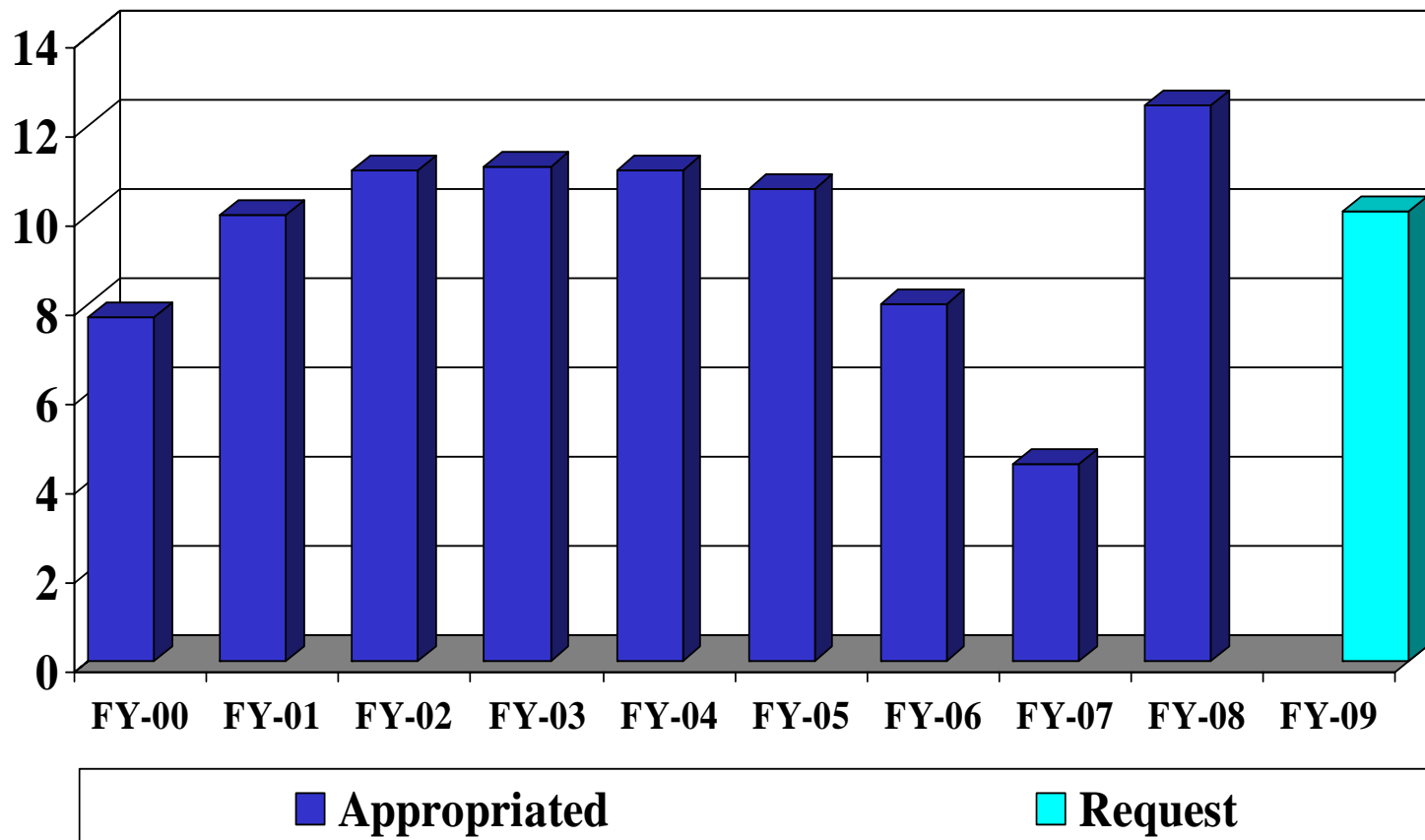
Funding Summary: Energy Efficiency and Renewable Energy

Programs:	FY 2007	FY2008	2009 Request	'08 v. '09
• Biomass and Biorefinery Systems R&D	196,277	198,180	225,000	+ 26,820
• Building Technologies	102,983	108,999	123,765	+ 14,766
• Federal Energy Management Program	19,480	19,818	22,000	+ 2,182
• Geothermal Technology	5,000	19,818	30,000	+ 10,182
• Hydrogen Technology	189,511	211,062	146,213	- 64,849
• Industrial Technologies	55,763	64,408	62,119	- 2,289
• Solar Energy	157,028	168,453	156,120	- 12,333
• Vehicle Technologies	183,580	213,043	221,086	+ 8,043
• Water Power	0	9,909	3,000	- 6,909
• Wind Energy	48,659	49,545	52,500	+ 2,955
• State and Other Supporting	498,960	659,172	213,590	-445582
• Total	1,457,241	1,722,407	1,255,393	-467,014



VT (Clean Cities) Deployment Budget

\$ Millions





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Technology Grants

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**





- **New Opportunities:**
 - **Stakeholder Meeting in Washington, D.C. later summer 2008**
 - **Solicitation in 2009:**
 - **Outreach and Educational Efforts**
 - **Infrastructure**
 - **Vehicles**
 - **Schools and Universities**

Other Funding Opportunities: GM

15-year anniversary celebration like beyond a billion

- **Similar to 1 billion gallon celebration efforts**



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Strategy: Strengthening Coalitions

- **Funding**
- **New Tools**
- **Web Casts and Training**
- **Regional and National Peer Exchanges**
- **Updated Designation and Redesignation Processes**
- **Coordinator Council**
- **National and Regional Partnerships**
- **PMCs Staffed at Previous Levels**



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The Energy Independence and Security Act of 2007

- Major Provisions and **Opportunities for Clean Cities Coalitions??**
 - Improved Energy Efficiency
 - Increased Use of Renewable Fuels
 - Electric Drive Vehicles
 - State and Federal Fleet



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EISA Origins

- **December 2007, Congress Passes and President Signs the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140)**
 - Key elements include expanded Renewable Fuel Standard (RFS) and increased Corporate Average Fuel Economy (CAFE)



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Corporate Average Fuel Economy (CAFE) – Title I

- Requires rule to increase CAFE levels to 35 mpg overall by 2020 (and maximum feasible levels thereafter) – estimated to save 0.9M barrels per day by 2020, and 2M barrels per day by 2030
- DOT/NHTSA (in consultation with DOE and EPA) to develop implementing regulations – starts with **Model Year 2011—Phases up**



Title II: Subtitle A—Renewable Fuel Standard (RFS)

- What is RFS? EPA sets annual benchmark representing amount of renewable fuel that must be used by each covered refiner, blender, or importer. RFS program includes registration, recordkeeping, reporting requirements for renewable fuel producers and obligated parties, and establishes a trading market for renewable fuel credits.
 - Standard = required RF volume/gasoline volume (less small refiners)
 - Just issued new standard for 2009 reflecting 9 BGY under EISA (7.76% on 2/14/08).

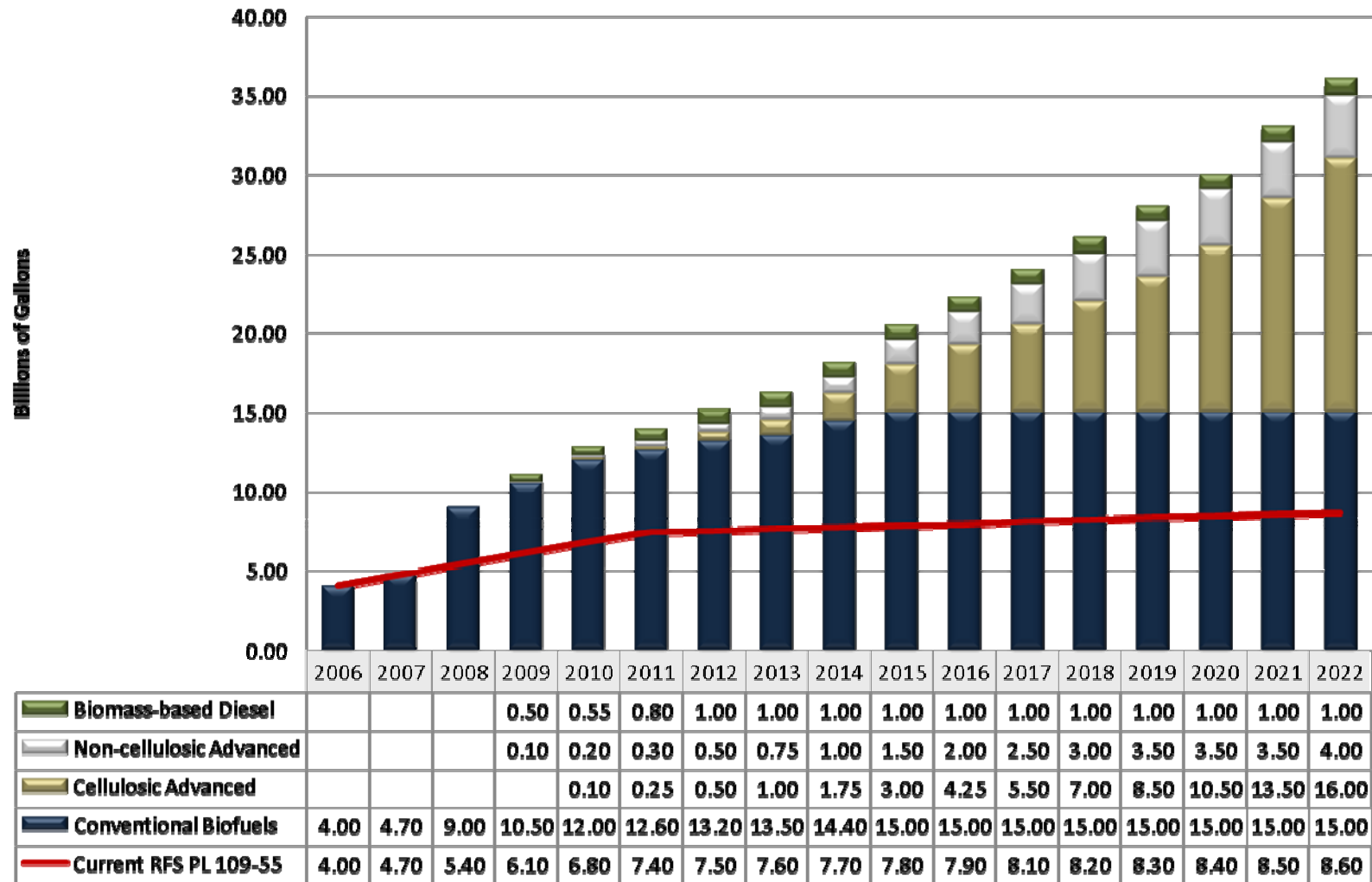


- **First RFS Final Rule; May 1, 2007**
- **Renewable fuels: 4 BGY per year 2006 to 7.5 BGY in 2012; 2013 + (0.25 BGY cellulosic)**
- **EPA converts RFS into percent of gasoline production each 10/31**

- **New rule due 12/2008**
- **Four categories of Renewable fuels 9 BGY in 2008 to 36 BGY in 2020:**
 - **Conventional Biofuel**
 - **Advanced Biofuel**
 - **Cellulosic Biofuel**
 - **Biomass Based Diesel**
- **EPA still converts to percent of gasoline production annually**



Renewable Fuel Standard (RFS), 2007-2022



Source: Hart Energy Consulting, Government Affairs, 2007



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- **Sec. 244 – Renewable Fuel Infrastructure & Fueling Station Grants**
- Calls for DOE to administer grants for renewable fuel infrastructure (blends of >10% up to 85% with gasoline (no cap for diesel blends) – up to 33% of costs, up to \$180,000 for any single retail outlet. No double benefit w/tax credits.
- Also allows for technical/marketing assistance.
- Also includes refueling infrastructure corridor program – up to 10 areas, maximum of \$20M/applicant, requires involvement of VTP deployment program participants
- \$200M/yr Authorization, FY2008-2014



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Opportunities for Clean Cities??

- Typical VTP outlay for infrastructure and other grant funding is about \$2-3 million per year (over past three or so years)
- \$200 million pilot project from EPACT 2005 never was appropriated
- Benefits of this grant program right now are speculative



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Sec. 241: Prohibition on restriction of installation of renewable fuel pumps

- Eliminates potential marketing barriers for renewable fuels as specified in franchise agreements that are governed by the Petroleum Marketing Practices Act.
 - Addresses signage, advertising credit cards, addition or conversion of equipment and tankage, purchasing renewable fuel from others besides franchisor, substitution of one gasoline grade (of 3), etc.
 - Exception: installing tank if franchisee is the lessor of premises.



S&FP and Federal Fleets Under EISA

- **Section 133** - Calls for DOE to allocate AFV credits under EISA 2007 Title V fleet programs (State and Alternative Fuel Providers) for electric drive technologies by 1/31/2009 - Not anticipated to apply to S&FP fleets until **MY2010**
- **Sec. 141**: Requires Federal Fleets to acquire only low-GHG-emitting vehicles
- **Sec. 142**: Puts Executive Order 13423 requirements into legislation – 20% petroleum reduction 2005-2015, and 10%/yr increase in AF use
- **Sec. 246**: Requires each Federal refueling facility to add a renewable fuel pump by 1/1/2010
- **Sec. 526**: Prohibits Federal agencies from procuring any fuels which are not lower in GHG emissions than petroleum-based fuels.



Expiration Dates for EPAct 2005 Tax Credits

- Vehicle Credits

- MD/HD Hybrid Motor Vehicle – **12/31/2009**
- Alternative Fuel Motor Vehicle - **12/31/2010**
- LD Hybrid Motor Vehicle and Advanced Lean Burn Technology Motor Vehicle – **12/31/2010***
- Fuel Cell Vehicles – **12/31/2014**
- **HR 5351 adds PHEV credit**

- Fuel Incentives

- Biodiesel – **12/31/2008**
- Natural Gas and LPG – **9/30/2009**
- Ethanol – **12/31/2010**; Hydrogen – **9/30/2014**
- **HR 5351 extends infrastructure for everything 50% or 50K through 2010; (current expires 12/31/09). Infrastructure technical correction**

** Subject to phase-out per 60,000 vehicle threshold, includes both hybrid and lean-burn vehicles sold by a manufacturer*



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- **2006 is the third year of the new portfolio and the online survey**
- **2006 data finalized and annual report written**
 - **80 coalitions completed their report**
 - **375 million GGE displaced during 2006 due to Clean Cities efforts**
 - **Coalitions directly responsible for 302 million (over 80%) of this displacement**
 - **Average fuel displaced per reporting coalition increased from 2.9 last year to 3.8 million GGE**
- **2007 data being collected**
 - **62 coalitions have completed so far**



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2006 Total Displacement: Northwest

State	Coalition	GGEs
CO	Colorado Springs	500,047
CO	Denver	6,475,623
CO	Northern Colorado	499,953
ID	Treasure Valley	201,780
ND	Red River Valley	1,042,602
OR	Columbia-Willamette	6,145,407
OR	Rogue Valley	95,077
UT	Utah	3,685,424
WA	Puget Sound	5,905,777
WY	Yellowstone-Teton	2,392,873
Total		26,944,563



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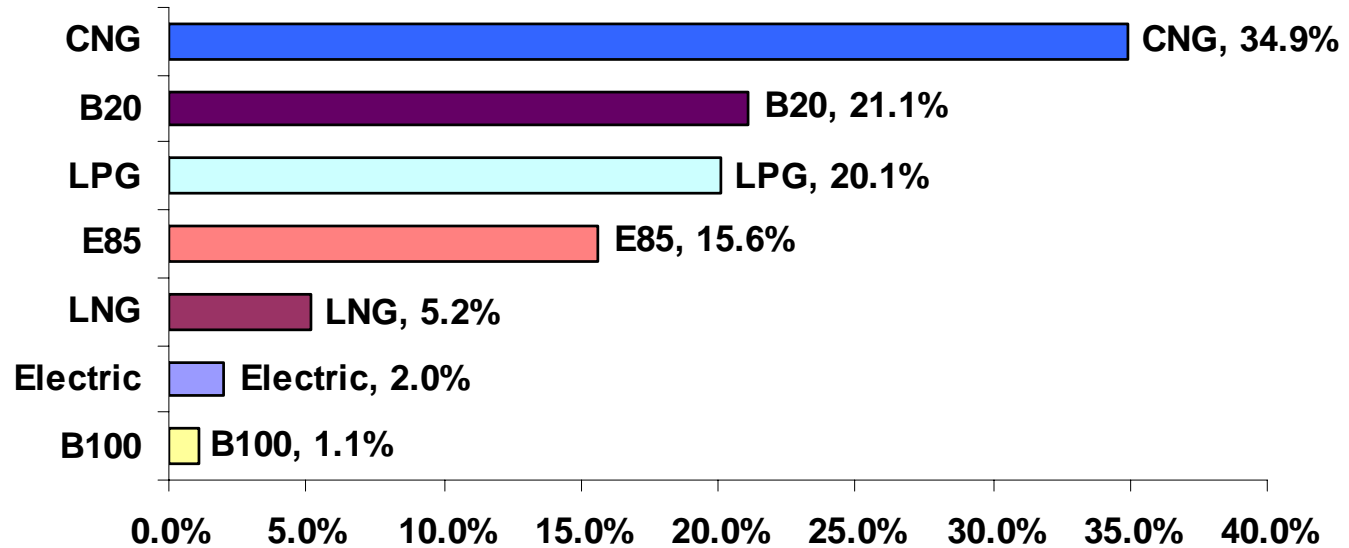


2006 Total Displacement: South Central

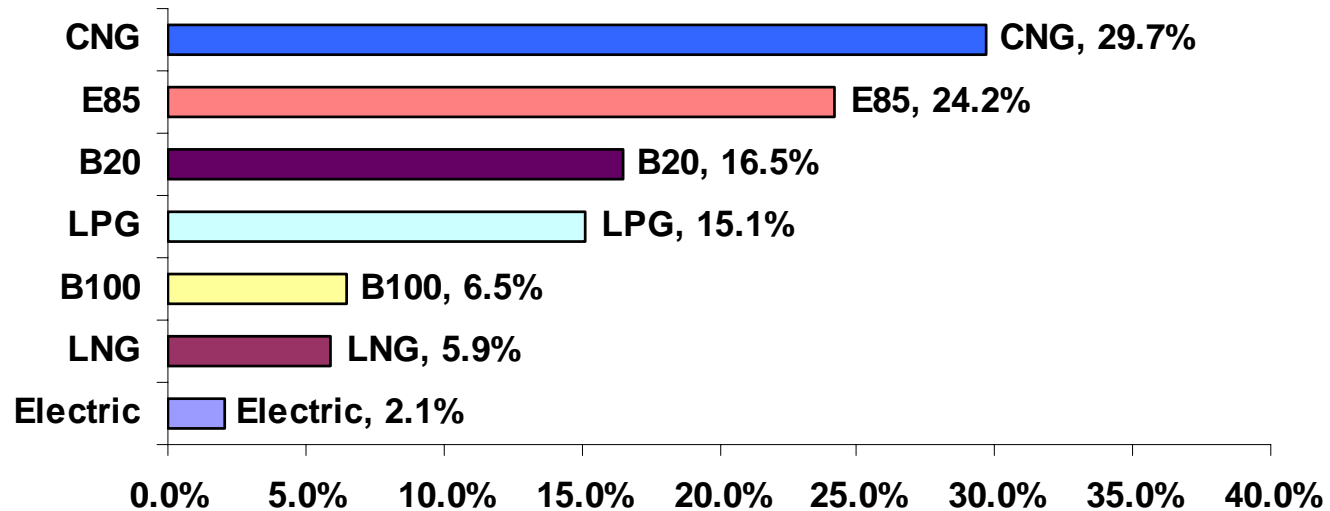
State	Coalition	GGEs
AR	Central Arkansas	3,625,343
AZ	Tucson	4,215,456
AZ	Valley of the Sun	12,414,321
LA	Baton Rouge	323,247
NM	Land of Enchantment	3,769,615
OK	Central Oklahoma	3,264,061
OK	Tulsa	1,366,295
TX	Alamo	3,773,414
TX	Central Texas	1,123,374
TX	Dallas/Ft. Worth	12,343,423
TX	East Texas	784,976
TX	Houston	153,811
TX	SE Texas	314,472
IA	Iowa	3,898,523
KS	Kansas City	9,512,741
MO	St. Louis	7,677,794
Total		68,560,868

AFV Petroleum Displacement Trends

2005



2006





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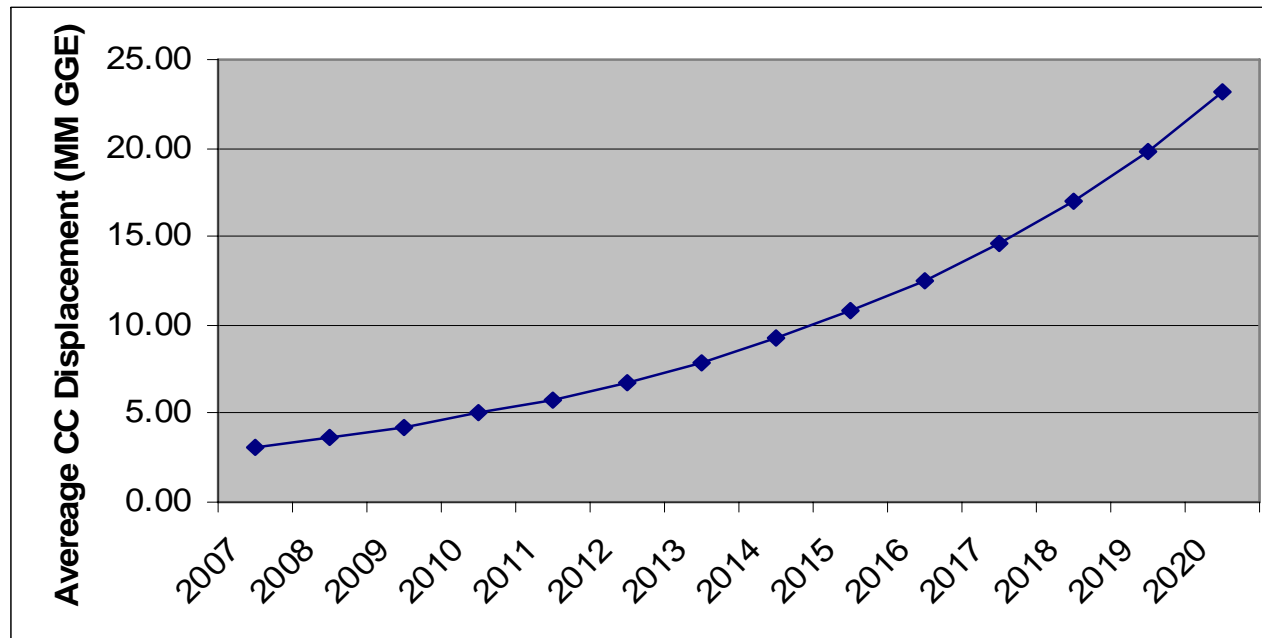


Top Performers in 2006

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, CAN	55



Displacement For 14.5% Growth Rate



Assumes

- Clean Cities achieves 14.5% growth rate annually
- Minimum number of coalitions reporting annually is 80 coalitions
- If more coalitions submit annual surveys, the required 14.5% annual growth rate needed to meet the 2020 goal may be reduced



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Goals & Annual Survey - Background

- **Analysis was done in 2003 to support 2004 Roadmap that expanded Clean Cities portfolio beyond alt fuels**
- **Clean Cities' annual fuel displacement potential is estimated to be roughly 2.5 billion GGE per year in 2020**
- **To achieve the 2020 goal, CC must achieve a 14.5% fuel displacement increase annually beginning with the 2006 petroleum displacement of 375 million gallons reported.**
- **Actual annual savings to be estimated through coalition questionnaires and ORNL fuel economy assessment**



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2006: Another Outstanding Year for Coalitions!

- **Education and Outreach Efforts**
 - 917 education and outreach activities reported
 - ~ 21 million people reached
 - AFVs and fuel blends the most popular topics
 - 590 new stakeholders
- **Funding**
 - 165 grants, worth \$87.3M awarded to coalitions
 - \$33.1M in leveraged funds
- **Coordinators**
 - Avg. coordinator has been on the job for 4.9 years
 - Spends 22 hrs/week (average) on Clean Cities
 - Coordinators worked over 80,000 hours pursuing Clean Cities program goals





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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
- Climate Change Mitigation

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Find and Compare Cars on Your Mobile Device

In the News...

Americans fear \$4 gas

Disclaimer

NEW MPG RATINGS FOR 2008



We have revised the 1985-2008 fuel economy estimates to make them more consistent with EPA's new 2008 MP

- New 1985-2008 MP
- Print the Fuel Econ

www.fueleconomy.gov

model year **2008**

Fuel Economy Guide

	Self Serve	Cash or Credit
Regular	329¢	329¢
Plus	339¢	339¢
Super	349¢	349¢

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New Features

•Energy Impact
Score

•Carbon
Footprint

*(created to help
emphasize the
benefits of
alternative fuels
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Search by MPG

Cars that don't need gasoline

Best and Worst MPG

2007 Toyota Prius

Hybrid Vehicle
Possible Tax Incentives
Use Your Gas Prices & Annual Miles
Switch to Metric units

Estimated New EPA MPG

MPG ratings for this vehicle have been revised

REGULAR GASOLINE

46 Combined
48 City 45 Hwy

Official EPA Window Sticker MPG

REGULAR GASOLINE

55 Combined
60 City 51 Hwy

MPG Estimates from Drivers Like You

Average based on 103 vehicles.

Learn more about "Your MPG"

Lo 32 → Hi 77
View Individual Estimates

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 CO₂ Emitted

4.0

Personalize Annual Miles

3.5 10.2

Internet



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- **Access fuel economy and related information at your convenience anywhere, anytime**
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 - **Annual fuel cost estimates**
 - **Annual petroleum use (barrels of domestic & imported petroleum)**
 - **Carbon footprint (tons of carbon dioxide emitted annually)**





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Alternative Fuels Hotline

- **1-877-337-3463**
- **Available 9:00 a.m. – 6:00 p.m. EST**
- **hotline@afdc.nrel.gov**

