Alternative Fuels and Advanced Vehicles: Resources for Fleet Managers

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Resources for implementing alternative fuels & advanced vehicles

- Context and motivations
- Step 1: Learn about the options
- Step 2: See what others have done
- Step 3: Are there regulations or incentives that affect you?
- Step 4: Set baseline and goal
- Step 5: Explore options for your fleet
- Step 6: Get help
- Feedback & Discussion
Clean Cities 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.

- Sponsored by the DOE’s Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Program
- Provides a framework for businesses and governments to work together as a coalition to enhance local markets
- Provides a way to coordinate activities, identify mutual interests, develop regional economic opportunities, and improve air quality
U.S. Petroleum Trends

Clean Cities Today

- 87 active coalitions in 45 states
- Coalitions cover 75% of U.S. population
- 8,400+ public, private stakeholders
- Coalitions generate 18:1 leveraging of Federal investment\(^1\)

\(^1\)http://www1.eere.energy.gov/cleancities/pdfs/49389.pdf
Gasoline and Diesel Prices

Source: http://www.eia.doe.gov/oog/info/gdu/gasdiesel.asp
• Besides cost, motivators include:
  – Reducing emissions of air pollutants or greenhouse gases
  – Meeting Federal or state mandates
  – Responding to corporate goals
  – Supporting regional economy
  – Promoting green image
Petroleum Displacement Strategies

- **Reduce** by promoting energy efficiency in vehicles through advanced technologies and more fuel-efficient vehicles.
- **Replace** petroleum with alternative fuels and low-level blends.
- **Eliminate** by promoting idle reduction, combining or eliminating trips, and other mileage reduction measures.
Clean Cities Portfolio of Technologies

**Alternative Fuels and Vehicles**
- Biodiesel (B100)
- Electricity
- Ethanol (E85)
- Hydrogen
- Natural gas
- Propane

**Fuel Blends**
- Biodiesel/diesel blends (B2, B5, B20)
- Ethanol/gasoline blends (E10)
- Hydrogen/natural gas blends (HCNG)

**Fuel Economy**
- Fuel efficiency
- Behavior changes
- Vehicle maintenance initiatives
- Reducing vehicle miles traveled (VMT)

**Hybrids**
- Light- and heavy-duty HEVs
- PHEVs

**Idle Reduction**
- Medium and heavy-duty trucks
- School buses
- Truck stop electrification
Step 1: Learn About the Options
Learn About Fuel Options

The Alternative Fuels & Advanced Vehicles Data Center (AFDC, formerly known as the Alternative Fuels Data Center) provides a wide range of information and resources to enable the use of alternative fuels (as defined by the Energy Policy Act of 1992), in addition to other petroleum reduction options such as advanced vehicles, fuel blends, idle reduction, and fuel economy.

This site is sponsored by the U.S. Department of Energy's Clean Cities initiative.

Data, Analysis, and Trends
Our Data, Analysis, and Trends section provides industry trends and facts based on data analysis.

Alternative Fuel Portals
- Biodiesel
- Electricity
- Ethanol
- Hydrogen
- Natural Gas
- Propane

More Fuels Information

Vehicle Information
- Conversions
- Electric Drive Vehicles
- Emissions
- Fuel Economy
- Idle Reduction

More Vehicle Information

AFDC Tools
- Light-Duty Vehicle Search
- Heavy-Duty Vehicle Search
- Alternative Fueling Station Locator
- Incentives & Laws Search
- Publications Search

National Clean Fleets Partnership

Site Map
EERE Information Center

NEWS
EPA Streamlines Alternative Fuel Conversion Compliance Requirements
March 30, 2011

EVENTS
NPGA SE Convention & International Propane Expo
04/16/2011 - 04/19/2011

FEATURES

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Clean Cities / 11
Alternative Fuels

Alternative fuels defined by the Energy Policy Act of 1992 that are or have been commercially available for vehicles include:

- Biodiesel
- Electricity
- Ethanol
- Hydrogen
- Methanol
- Natural Gas
- Propane

Other Fuels

Several emerging fuels are currently under development. Many of these fuels are also considered alternative fuels and may have other benefits such as reduced emissions or increased energy security.

- Biobutanol
- Biogas
- Biomass to Liquids (BTL)
- Coal to Liquids (CTL)
- Fischer-Tropsch Diesel
- Gas to Liquids (GTL)
- Hydrogenation-Derived Renewable Diesel (HDRD)
- P-Series
- Ultra-Low Sulfur Diesel

Fuel Topics

Learn about these additional alternative and advanced fuel topics:
Hybrid, Plug-in Hybrid, and All-Electric Vehicles

Hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and all-electric vehicles (EVs)—also called electric drive vehicles collectively—use electricity either as their primary fuel or to improve the efficiency of conventional vehicle designs.

Basics
Learn how electric drive vehicles work.

Benefits
Explore the benefits of electric drive vehicles.

Availability
Discover which electric drive vehicles are available commercially.

Emissions
Learn how emissions and fuel costs are calculated for electric drive vehicles.

Charging
Explore ways to charge electric drive vehicles at home and in public.

Batteries
Learn about energy-storage devices and recycling.

Maintenance and Safety
Learn about maintaining electric drive vehicles and their batteries.

Deployment
Learn about deployment and demonstration projects to commercialize electric drive vehicles.

Research and Development
Read about electric drive vehicle studies and trends.

Related Links
Find links to additional resources on electric drive vehicles.
AFDC Light- and Heavy-Duty Vehicle Search

Alternative & Advanced Vehicles

Light-Duty Vehicle Search

Search our light-duty alternative fuel vehicle database to find and compare alternative fuel vehicles and generate printable reports to aid in decision-making.

Fuel Type
- Natural Gas
- All

Year
- 2011 (0)
- 2009 (1)
- 2008 (1)
- 2007 (1)
- 2006 (4)

Compare
- Honda Civic GX (2009)

Detail
- Honda Civic GX (2009)
- Fuel: Natural Gas (Dedicated)
- Color: Sedan
- Horsepower: 24 mpg city, 36 mpg highway
- Emission Certification: California SULEV, Tier 2 Bin 2
- Engine: 4-cyl, 1.8L, ROHC 1.8-Valve i-VTEC
- Transmission: 5-speed automatic
- GVWR: 2944 lbs
- Ordering: Orders for the Honda GX are taken anytime during the model year. Honda builds vehicles in advance for anticipated sales, and the GX is available in 60-90 days, or 39 days if in current stock

Cost Analysis

Alternative & Advanced Vehicles

Heavy-Duty Vehicle and Engine Search

Use this tool to get specification and purchasing details on specific vehicles (chassis) or engines. You can also compare selections and generate printable reports to aid in the decision-making process.

Manufacturer
- Autocar LLC

Fuel Type
- CNG, LNG

Application
- All

Compare
- Xeeditor

Detail
- Model: Xeeditor
- Manufacturer: Autocar, LLC
- Manufacturer Phone: 877-973-3486
- Application: Refuse
- Fuel Type Options: CNG, LNG
- GVWR: 66000 lbs
- Maximum Seating Capacity: 2
- Transmission Make: Allison MD-HD
- Transmission Type: Auto
- Description: Class 8 trucks built for the refuse business. The Xeeditor includes ergonomically redesigned cabs with dashboard-integrated body switches and controls.

Compatible Engines:
- 8 Gas Plus - DG 199
Alternative Fueling Stations

Alternative fueling stations are located throughout the United States and their availability continues to grow. This page allows you to find alternative fuels stations near you or on a route, obtain counts of alternative fuels stations by state, view U.S. maps, and more.

The following alternative fuels are included in the mapping application: compressed natural gas (CNG), E85 (85% ethanol, 15% gasoline), propane/liquefied petroleum gas (LPG), biodiesel, electricity, hydrogen, and liquefied natural gas (LNG).

Alternative Fueling Station Mapping Resources
Find Alt Fuel Stations Near You
(example)
Find Fuel On-the-Go

Alternative Fueling Station Locator

Fuel Type
Ethanol (E85)

Location
Enter a city, postal code, or address

Include private stations
Not all stations are open to the public. Choose this option to also search private fueling stations.

Search

Caution: The AFDC recommends that users verify that stations are open, available to the public, and have the fuel prior to making a trip to that location. Some stations in our database have addresses that could not be located by the Station Locator application. This may result in the station appearing in the center of the zip code area instead of the actual location.

http://www.afdc.energy.gov/cleancities/m/
Step 2: See What Others Have Done (part 1)

The Alternative Fuels and Advanced Vehicle Data Center (AFDC, formerly known as Alternative Fuels Data Center) provides a range of information and resources to support the use of alternative fuels (as defined by the Energy Policy Act of 1992), in addition to petroleum reduction options such as alternative fuel vehicles, fuel blends, idle reduction, and other strategies to improve the economy.

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Fleet Experiences

Learning from other fleet experiences can be helpful when implementing alternative fuel and advanced technology vehicles in your fleet. This compilation of fleet experiences tells how other fleets are using alternative fuel vehicles, dealing with infrastructure issues, obtaining funding, and more.

Read about fleet experiences by selecting the links in the table below. Choose a link beneath any topic to find experiences related to your area of interest. For a glimpse of how specific fleets utilize alternative fuels and advanced vehicles, visit the Fleet Applications page.

Vehicle Category
- Light-Duty Vehicles
- Medium/Heavy-Duty Vehicles
- Low-Speed Vehicles
- Off-Road Vehicles

Fuel/Technology Type
- Biodiesel
- Electric
- Ethanol
- Hybrid Electric
- Hydrogen
- Natural Gas
- Propane

Fleet Applications
- Airports
- Delivery Vehicles
- Long-Haul Trucks
- Parks
- Police/Traffic Enforcement
- Refuse Haulers
- School Buses
- Shuttle Buses
- Taxicabs
- Transit Buses

Clean Cities / 19
Step 2: See What Others Have Done (part 2)
Step 3: Are There Regulations or Incentives That Affect You?
Are There Regulations or Incentives That Affect You?

Federal Fleets

http://www1.eere.energy.gov/femp/program/fedfleet_management.html
Are There Regulations or Incentives That Affect You?

State and Fuel Provider (Utility) Fleets

http://www1.eere.energy.gov/vehiclesandfuels/epact/
Step 4: Set Baseline and Goal

• Inventory fleet: Types/classes of vehicles
  – Number of each type/class
  – Annual miles traveled
  – Annual fuel consumption
  – Annual $CO_2$ produced
    • 19.4 pounds per gallon gasoline*
    • 22.2 pounds per gallon diesel*

• Set goal for fuel reduction
  – No new vehicle purchases?
  – Next year’s acquisitions?
  – 10 year reduction?

* [http://www.epa.gov/oms/climate/420f05001.pdf](http://www.epa.gov/oms/climate/420f05001.pdf)
Step 5: Explore Options for Your Fleet

AFDC Petroleum Reduction Planning Tool

Petroleum Reduction Plan
Scenario Name: Test2
Annual Petroleum Reduction Goal: 250,000 GGE

Based on your inputs, this is your petroleum reduction goal and associated plan. You may print the information on this page and use it to help you reach your goal. If you are a registered user, this scenario is saved in the system and you may make changes at a future time.

To alter your plan, return to Step 2.

Alternative Fuels

<table>
<thead>
<tr>
<th>AFV Type</th>
<th>AFV Fuel</th>
<th>Number of AFVs</th>
<th>Average VMT</th>
<th>Fuel Economy (mpg)</th>
<th>Fraction of Fuel Use</th>
<th>GGE Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Pickup/Utility</td>
<td>LPG</td>
<td>50</td>
<td>10000</td>
<td>20</td>
<td>1</td>
<td>25000</td>
</tr>
<tr>
<td>Midsize Car</td>
<td>E85</td>
<td>100</td>
<td>15000</td>
<td>25</td>
<td>1</td>
<td>47400</td>
</tr>
<tr>
<td>HD Truck &gt; 26k lb</td>
<td>CNG</td>
<td>25</td>
<td>15000</td>
<td>5</td>
<td>1</td>
<td>86025</td>
</tr>
<tr>
<td><strong>TOTAL GGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>158425</strong></td>
</tr>
</tbody>
</table>

Hybrid Electric Vehicles (HEVs)

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Number of Vehicles</th>
<th>Average VMT</th>
<th>Fuel Economy of new HEVs</th>
<th>Fuel Economy of Old Vehicles</th>
<th>GGE Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>75</td>
<td>15000</td>
<td>45</td>
<td>30</td>
<td>12500</td>
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<tr>
<td><strong>TOTAL GGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>12500</strong></td>
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</tbody>
</table>

Biodiesel Blends

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Blend Type</th>
<th>Number of Vehicles</th>
<th>Average VMT</th>
<th>Fraction of Fuel Use</th>
<th>Fuel Economy</th>
<th>GGE Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD Truck &gt; 26k lb</td>
<td>880</td>
<td>50</td>
<td>15000</td>
<td>1</td>
<td>5</td>
<td>80777</td>
</tr>
<tr>
<td><strong>TOTAL GGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>80777</strong></td>
</tr>
</tbody>
</table>

https://www.afdc.energy.gov/afdc/prep/index.php
FuelEconomy.gov Web Site

Fuel economy information
✓ Side-by-side comparisons
✓ Fuel economy ratings
✓ Carbon footprint
✓ Average annual fuel cost
✓ Smart driving tips
(Soon) Compare Costs

AFDC Cost Calculator

✓ Side-by-side cost comparisons
✓ Operating costs
✓ Fuel consumption & cost
✓ CO₂ emissions

In development—live April 2011
Step 6: Get Help!

Clean Cities Web Site

- Financial opportunities
- Information resources
  - Newsletters
  - Technology bulletins
  - Technical assistance
- Local experts and resources

http://www1.eere.energy.gov/cleancities/
Clean Cities Financial Opportunities

Solicitations
Securing funding is critical to the success of every petroleum displacement program. To ensure stakeholders meet their goals, Clean Cities tracks financial opportunities specific to alternative fuels and advanced technologies.

There are many financial opportunities available. To explore them, choose the links below. When applying for funding, ask your local Clean Cities coordinator for help. Coordinators can offer sound advice on how to successfully navigate the process to obtain the funding needed to meet petroleum reduction goals.

Solicitations
- View Clean Cities' other transportation-related funding opportunities.

Government Sources
Look up funding opportunities available from other government agencies.

Government Sources
The following government agencies are potential funding sources for your transportation-related project. Some agencies have ongoing funding available; others issue notices or assistance in forming partnerships that can bring projects to fruition.

Grants.gov
Grants.gov allows organizations to electronically find and apply for competitive grant opportunities from Federal agencies. This site is the only access point for more than 900 grant programs offered by the 26 Federal grant-making agencies. To search for funding, use the Find Grant Opportunities feature on the Grants.gov Web site.

Metropolitan Planning Organizations
The Metropolitan Planning Organization (MPO) is a transportation-planning cooperative effort between local government and transportation authorities. MPOs are responsible for planning, programming, and coordinating federal highway and transit investments. Visit the MPO Web site for information on funding opportunities and potential project partners.

Congestion Mitigation and Air Quality
Congestion Mitigation and Air Quality (CMAQ) funds are distributed locally through MPOs. The funds are administered by the Federal Highway Administration and the Federal Transit Administration. CMAQ funds projects and programs that reduce transportation-related emissions in nonattainment and maintenance areas. For more information, check their CMAQ Web site.

Environmental Protection Agency
The Environmental Protection Agency (EPA) offers financial opportunities in several of its departments. For more information, visit the EPA Web site.
Start working with the Clean Cities coalition in your area.

http://www.afdc.energy.gov/cleancities/progs/coalition_locations.php
Charter Members:

- AT&T
- FedEx
- PepsiCo
- UPS
- Verizon

Surrounded by cutting-edge vehicles, from all-electric trucks to hydraulic hybrids, President Obama today announced the National Clean Fleet Partnership, an initiative of the Department's Clean Cities program, at a UPS fleet facility in Landover, Maryland. This public-private partnership will draw on the expertise of the Department of Energy to help large companies...
Web Sites and Resources

Clean Cities Web site
www.cleancities.energy.gov

Alternative Fuels & Advanced Vehicles Data Center Web site
www.afdc.energy.gov

FuelEconomy.gov
www.fueleconomy.gov

Clean Cities Coordinator Contact Information and Coalition Web sites
http://www.afdc.energy.gov/cleancities/progs/coalition_locations.php

DOE EERE Information Center and Technical Response Service
Web Site: 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
Web Sites and Resources

Clean Cities Information Resources
http://www1.eere.energy.gov/cleancities/info_resources.html

Data, Analysis & Trends
http://www.afdc.energy.gov/afdc/data/index.html

Clean Cities Financial Opportunities
http://www1.eere.energy.gov/cleancities/financial_opps.html

AFDC PREP tool
https://www.afdc.energy.gov/afdc/prep/index.php

Fleets
http://www.afdc.energy.gov/afdc/ fleets/index.html

Vehicle Search
http://www.afdc.energy.gov/afdc/progs/vehicles_search.php

Publications Database
http://www.afdc.energy.gov/afdc/publications.html

Alternative Fuel Station Locator
http://www.afdc.energy.gov/afdc/locator/stations/

State and Federal Incentives & Laws
http://www.afdc.energy.gov/afdc/incentives_laws.html

TransAtlas
http://www.afdc.energy.gov/afdc/data/geographic.html

Truck Stop Electrification Locator

Conversions
http://www.afdc.energy.gov/afdc/vehicles/conversions.html
Other Federal Agency Web Sites

Energy Information Administration (EIA)
http://www.eia.doe.gov

U.S. Environmental Protection Agency (EPA)
http://www.epa.gov

Internal Revenue Service (IRS)