

New England MPO and RPC Webinar: Alternative Fuels and Clean Cities



Steve Linnell, Maine Clean Communities
Steve Russell, Massachusetts Clean Cities
Michelle McCutcheon-Schour, Vermont Clean
Cities
Alexis Schayowitz, ICF International

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- ❑ **Alternative Fuels 101**
- ❑ New England Clean Cities Coalitions Overview
- ❑ Clean Cities Tools
- ❑ New England Planning Document Literature Review
- ❑ Guide for New England MPOs and RPCs
- ❑ Questions

Alternative Fuels 101: Overview



Idle Reduction



Parts & Equipment



Vehicle Maintenance



Driver Behavior



Fleet Rightsizing



Transportation System Efficiency

Source: Alternative Fuels Data Center (AFDC)

Biodiesel



- Manufactured from vegetable oils, animal fats, or recycled restaurant grease
- Primary use: heavy-duty diesel engines
- Can be blended and used in many different concentrations
- Improved fuel quality over last several years

Ethanol

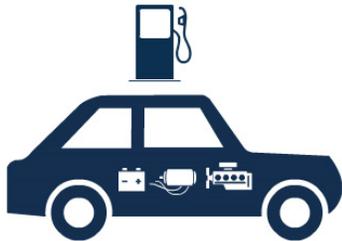


- Renewable fuel produced from starchy (corn, sugar cane, sugar beets) and cellulosic (yard waste, grasses, poplars) feedstocks
- Can be blended and used in many different concentrations
- Consideration: Energy content/fuel economy

Alternative Fuels 101: Electricity



Hybrid electric vehicle (HEV)



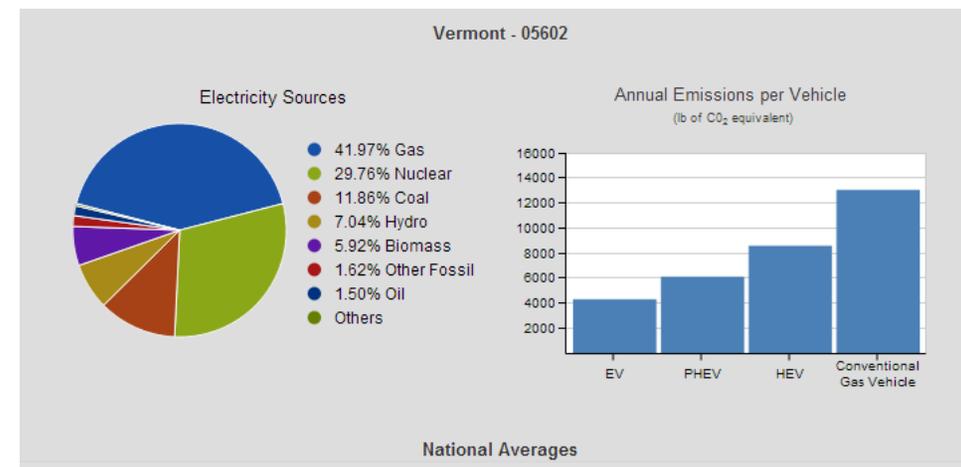
Plug-in hybrid electric vehicle (PHEV)



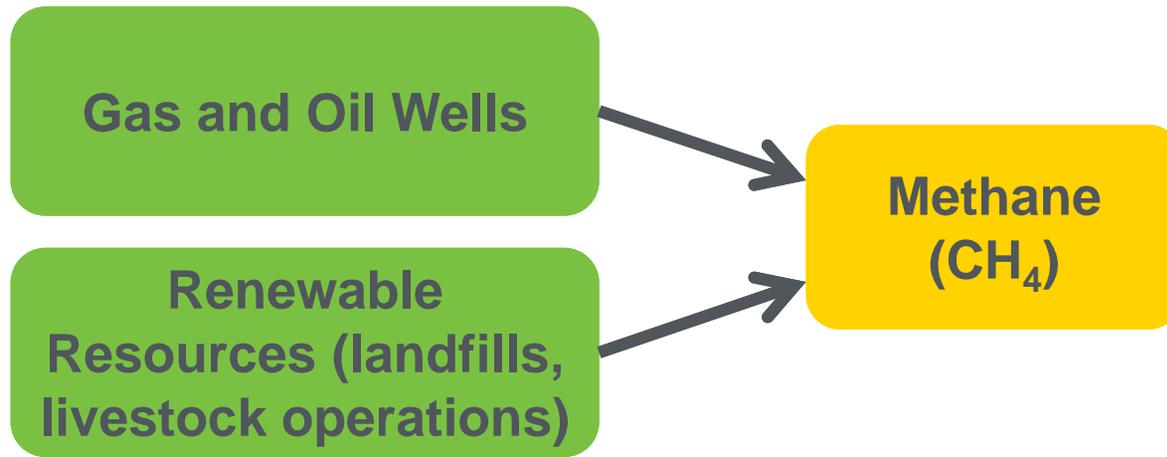
All-electric vehicle (EV)



- A variety of charging options
 - Level 1
 - Level 2
 - DC Fast Charge
- Gateway to hydrogen fuel cell vehicles



Source: AFDC



- Consideration: Driving range of natural gas vehicles (NGVs)
- Conversions allow fleets to modify vehicles or engines to operate using a different fuel or power source



Source: NREL Images #17170



- Produced as a by-product of natural gas processing and crude oil refining
- Light-duty vehicles available, as well as engines and fueling systems available for heavy and medium-duty vehicles



Source: AFDC

Idle Reduction

- Onboard equipment (auxiliary power units)
- Truck stop electrification

Equipment

- Low rolling resistance tires
- Aerodynamic equipment and design
- Fuel tracking devices and telematics
- Speed control modules

Driver Behavior

- Train drivers (slow down, drive conservatively)
- Give feedback
- Provide incentives
- Implement policies
- Optimize routes
- Use fleet cards
- Maintain your vehicle
- Reduce loads

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Maine



Clean Communities

- Covers the entire state
- Formed in 1995; designated by the U.S. Department of Energy (DOE) in September 1997
- Coalition structure:
 - Housed at Greater Portland Council of Governments (GPCOG)
 - Governed by GPCOG Board
 - 65 Stakeholders – and growing
 - Biannual meetings
 - Funded by DOE, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) through Portland Area Comprehensive Transportation System (PACTS) Metropolitan Planning Organization (MPO)
- Steve Linnell, Clean Cities coordinator since 1995
 - Director of Transportation and Energy Planning (with GPCOG for 20 years)
 - Transit planning, sustainability
 - 2001 Legal Eagle Award

- EVs & EVSE
 - Central Maine Power grant to lease Nissan Leaf for two years/installed two charging stations at GPCOG office
 - Lending out vehicle to stakeholders and municipal members
 - Exploring net metering of Solar generated electricity to supply public EVSE
 - Working with L.L. Bean and other businesses to install EVSE
- CNG Infrastructure and CNG Fleets
 - Continue working with Portland METRO to convert bus fleet (18 total); and Portland Public Schools (13 total)
 - Expand existing CNG fueling facility to other bus fleets
 - Continue working with waste haulers and CNG developers



Jennifer Puser and Adam Lee at EV Plug-In Day 2013



Portland METRO CNG Bus

- Locally Produced Biodiesel
 - Oakhurst Dairy – Using up to B70!
 - Working with Casco Bay Lines and Maine Standard Biofuels to use B20 in ferry fleet
- Autogas Infrastructure and Fleets
 - R.H. Foster and other Dealers
 - School Bus Fleets
 - Island Explorer
- Quarterly Newsletter
- Email blasts
- Educational Workshops



Casco Bay Lines' Aucosisco III Ferry

- Acadia National Park

- Funding for propane-powered passenger vans, HEV sedans, low-speed EVs, and EV charging infrastructure
- Will reduce size, increase efficiency and sustainability of the fleet
- Provide short range transport on the Schoodic Education and Research Center (SERC) campus, local, and in-state travel for park staff and various users with longer range vehicles and longer distance travel and transportation of multiple passengers in state and the region



Acadia Gateway Center



SERC Campus



The coalition was designated in 2009.

- Massachusetts Clean Cities (MCCC) is housed in the renewable division of the Massachusetts Department of Energy Resources
- Coalition was recently re-designated so it will continue to receive U.S. Department of Energy (DOE) funding
- Coalition has over 300 stakeholders in both the public and private sector

- Have alternative fuel stakeholder meetings every 2 months; have covered everything from EVs to fuel cells
- Coordinate with other coalitions in the region and work together on many projects
- Have been part of the Transportation Climate Initiative, a regional program that worked on EV initiatives
- Provide grant funding for alternative fueled technologies
- Coordinate AltWheels, an annual event for fleet managers on alternative fuels
- Offer free consulting to fleets across the Commonwealth

The main logo for the Vermont Clean Cities Coalition. It features the word 'Vermont' in a large, bold, brown serif font at the top. Below it, the words 'Clean Cities Coalition' are stacked in a blue serif font. A green silhouette of the state of Vermont is positioned to the right of the text. The background consists of a light blue gradient with a stylized city skyline of various blue rectangular blocks.



- Designated in 2001 as an official U.S. Department of Energy (DOE) Clean Cities Coalition
- A part of a network of over 100 Clean Cities Coalitions
- Serves the entire state of Vermont
- Housed at the University of Vermont (UVM) Transportation Research Center
- A part of the Northeast Clean Cities Region
- Single Goal: Reduce petroleum use in the transportation sector
- Five member Advisory Board that provides oversight and support

- EVs and EVSE
 - Drive Electric Vermont
 - University of Vermont electric vehicle charging stations feasibility study
 - City of Winooski *Clean Cities Success Story* video
- CNG Infrastructure, CNG Fleets, and Renewable Natural Gas (RNG)
 - Working with local and national players to promote RNG as a fuel source
 - CNG fueling
 - Working with waste haulers, transit providers, and Vermont Gas to increase the use of CNG as a vehicle fuel



Current Projects and Activities



- Biodiesel
 - Supporting the efforts of Bourne Energy and other biodiesel distributors to increase the access to biodiesel in the state
 - Black Bear Biodiesel
- Propane Autogas Infrastructure and Fleets
 - Looking into propane for school buses
- Quarterly Newsletter
 - Events and current news
 - Current grant opportunities
- Grant Support to Stakeholders
- Educational Workshops
- Fleet Manager Meetings
- Disaster Preparedness and Alternative Fuels Research



New England Coalition Example Stakeholders



Maine Clean Communities

- City of Portland
- Maine School Administrative District #6
- American Natural Gas
- Maine Standard Biofuels
- Casella Waste Systems
- Greater Portland METRO
- Oakhurst Dairy
- University of Southern Maine
- Clean Air – Cool Planet
- Acadia National Park
- Hydrogen Energy Center
- PACTS MPO

Massachusetts Clean Cities

- City of Boston
- MBTA
- Cape Cod Biodiesel
- XL Hybrids
- National Grid
- Holyoke Gas and Electric
- Braun's Express
- Staples
- LaSalle College
- UMass Amherst
- EPA
- Sierra Club

Vermont Clean Cities

- City of Burlington
- City of Winooski
- Vermont Gas
- VTrans
- Burlington International Airport
- Black River Produce
- Green Mountain Coffee
- Bourne Biodiesel
- Proctor Propane
- University of Vermont
- Casella Waste Systems
- Idle Free VT

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Alternative Fuels Data Center (AFDC) (<http://www.afdc.energy.gov/>)

- Comprehensive resource for information relating to alternative fuels, alternative fuel vehicles (AFVs), alternative fueling station locations, and more

The screenshot shows the AFDC website with a navigation menu including 'FUELS & VEHICLES', 'CONSERVE FUEL', 'LOCATE STATIONS', 'LAWS & INCENTIVES', 'Maps & Data', 'Case Studies', 'Publications', 'Tools', 'About', and 'Home'. A search bar is located in the top right corner.

Fuels & Vehicles

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

Maps & Data

- U.S. Alternative Fueling Stations by Fuel Type
- Alternative Fuel Vehicles in Use
- U.S. Hybrid Electric Vehicle Sales by Model

Tools

- Station Locator
- Vehicle Cost Calculator
- Light-Duty Vehicle Search
- Heavy-Duty Vehicle Search

Considering CNG?
Use the VICE Model to evaluate payback periods for stations and vehicles.

The Information Source for Alternative Fuels and Advanced Vehicles

The Alternative Fuels Data Center (AFDC) provides information, data, and tools to help fleets and other transportation decision makers find ways to reduce petroleum consumption through the use of alternative and renewable fuels, advanced vehicles, and other fuel-saving measures.

The AFDC is a resource of the U.S. Department of Energy's [Clean Cities](#) program.

Find State Information
Select a state

Find alternative fueling station locations.
Find stations on your iPhone

Poll

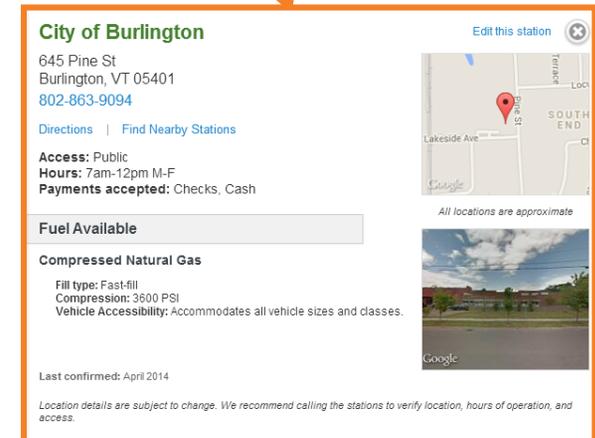
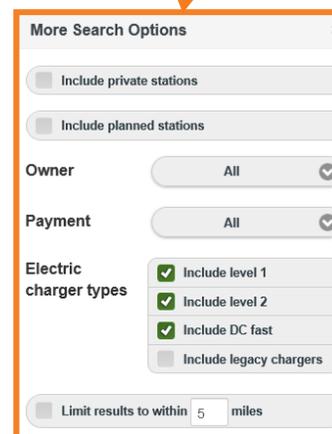
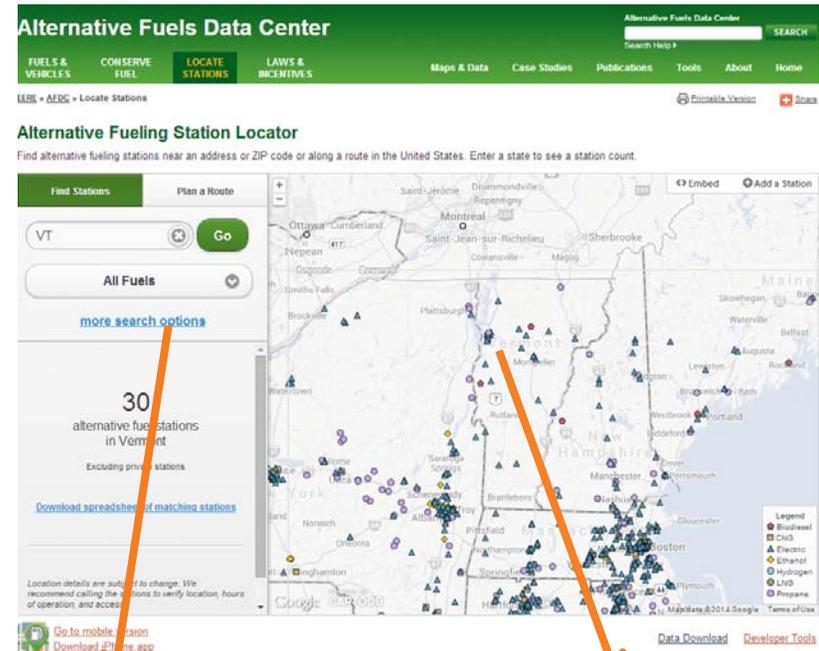
I am primarily interested in (check all that apply):

- Finding alternative fueling stations
- Comparing alternative fuel and gasoline prices
- Researching alternative fuels and vehicles
- Finding technical assistance for my project
- Finding alternative transportation data
- Learning about others using alternative fuels
- Finding incentives or funding opportunities
- Researching laws and regulations
- Other

Alternative Fueling Station Locator Database

(<http://www.afdc.energy.gov/locator/stations/>)

- **Find a station** (public, private or planned) by fuel type and address, zip, or state
- **More search options** allow users to search by access, owner, and payment
- **Plan a route** function for finding stations along a route
- **Data download** function to download a list of stations by fuel type, access, and status



Clean Cities Tools: Vehicle Cost Calculator



U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy EERE Home | Programs & Offices | Consumer Information

Alternative Fuels Data Center

Alternative Fuels Data Center Search Help SEARCH

FUELS & VEHICLES CONSERVE FUEL LOCATE STATIONS LAWS & INCENTIVES Maps & Data Case Studies Publications Tools About Home

EERE > AFDC > Tools [Printable Version](#) [Share](#)

Vehicle Cost Calculator

This tool uses basic information about your driving habits to calculate total cost of ownership and emissions for makes and models of most vehicles, including alternative fuel and advanced technology vehicles. Also see the [cost calculator widgets](#). [ASSUMPTIONS](#)

Choose vehicles to compare
Select up to eight vehicles to compare from the makes and models below or [create your own custom vehicle](#).

2014 Make Model [ADD >>](#)
[Create Custom Vehicle](#)

Tell us how you use your car
Because vehicle efficiencies vary depending on how you use your car, this information allows the tool to more accurately calculate fuel usage.

Normal Daily Use

Average daily driving distance miles
Days per week
Weeks per year
Percent highway

Other Trips

Annual mileage miles
Percent highway

Annual Driving Distance 11926 miles
City Distance 5301 miles
Highway Distance 6625 miles

[GET RESULTS](#)

Disclaimer:
The U.S. Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL) do not endorse any companies or products described on the Vehicle Cost Calculator. Vehicle prices and specifications change frequently. Not all data have been verified by DOE or NREL, which manages the site. Consult a dealer or vehicle manufacturer before making purchasing decisions.

Vehicle Cost Calculator (<http://www.afdc.energy.gov/calc/>)

- Compare cost of ownership and emissions for most vehicle models
- Uses defaults and basic information about your driving habits, such as average daily driving and annual mileage



Light-Duty Vehicle Search

(<http://www.afdc.energy.gov/vehicles/search/light/>)

- Identify light-duty AFVs and advanced vehicles

Heavy-Duty Vehicle and Engine Search

(<http://www.afdc.energy.gov/vehicles/search/heavy/>)

- Find medium and heavy-duty AFVs, engines, and hybrid systems

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. These vehicles might not qualify for vehicle-acquisition credits under the U.S. Department of Energy's [EPA State and Fuel Provider](#) or [Federal Fleet Management](#) programs. Contact these programs if you have questions about eligible vehicles.

Fuel Type	Manufacturer	Class
All	All	All
Years		
<input checked="" type="checkbox"/> 2015 (1)	<input checked="" type="checkbox"/> 2014 (196)	<input type="checkbox"/> 2013 (161)
<input type="checkbox"/> 2012 (120)	<input type="checkbox"/> 2011 (104)	
More Years		

Heavy-Duty Vehicle and Engine Search

Search our database to find and compare specific vehicles, engines, or hybrid propulsion systems and generate printable reports.

Vehicles	Engines & Power Sources	Hybrid Propulsion Systems
Manufacturer		
All	All	All
Fuel Type		
All	All	All
Application		
All	All	All

Case Studies

Find case studies and success stories about alternative transportation technologies and alternative fuels.



Category Keyword

Choose one or more items from the following categories.

Fuel/Technology

- All Fuels
- Biodiesel
- Ethanol
- Hydrogen
- Propane
- Natural Gas
- All-Electric
- Hybrid Electric
- Plug-In Hybrid Electric
- Fuel Economy Improvements
- Idle Reduction

Applications

- All Applications
- Long-Haul Trucking
- Refuse Collection
- Taxi Services
- Airport
- Delivery Services
- Law Enforcement
- Park Services
- Public Transit
- School Transportation
- Shuttle Services
- Off-Road

SEARCH
CLEAR

Search Results | 161 case studies

Date	Title	Type
March 12, 2014	Utah's Clean Fuels and Vehicle Technology Loan Program	Web Story
Feb. 1, 2014	Renzenberger Inc Saves Money With Propane Vans	Video
Jan. 21, 2014	Companies Power up Through Workplace Charging Challenge	Video
Jan. 18, 2014	Schwan's Home Service Delivers With Propane-Powered Trucks	Video
Jan. 15, 2014	Rental Cars Go Electric in Florida	Video
Jan. 4, 2014	Michigan Transports Students in Hybrid Electric School Buses	Video
Dec. 21, 2013	Los Angeles Public Works Fleet Converts to Natural Gas	Video
Dec. 14, 2013	Salt Lake City Fuels Vehicles With Natural Gas	Video
Nov. 21, 2013	Corporate Fleets Set the Pace for a Green Driving Future	Video
Nov. 21, 2013	Hybrid and Electric Vehicles Boom Coast to Coast	Video

Showing 1 to 10 of 161

← Previous
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3
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Next →

Case Studies Search

(<http://www.afdc.energy.gov/case>)

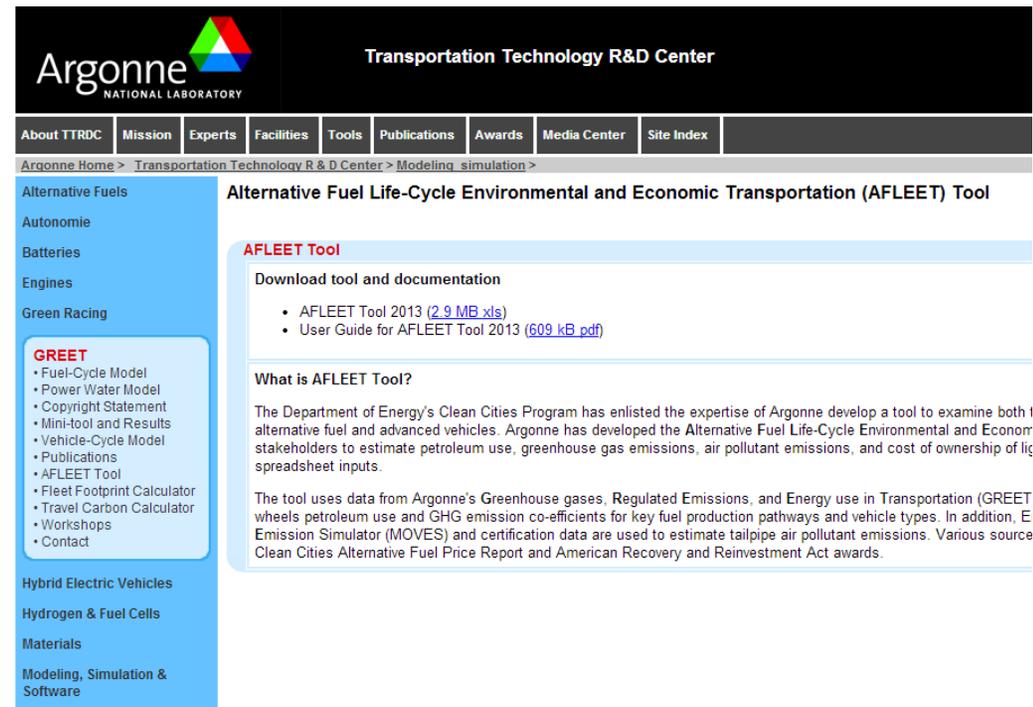
- Find video and written case studies about alternative fuel deployment in fleets
- Search by fuel/technology and/or application

Clean Cities Tools: Case Studies Search Results - Cold Weather and Mountain Area Operations



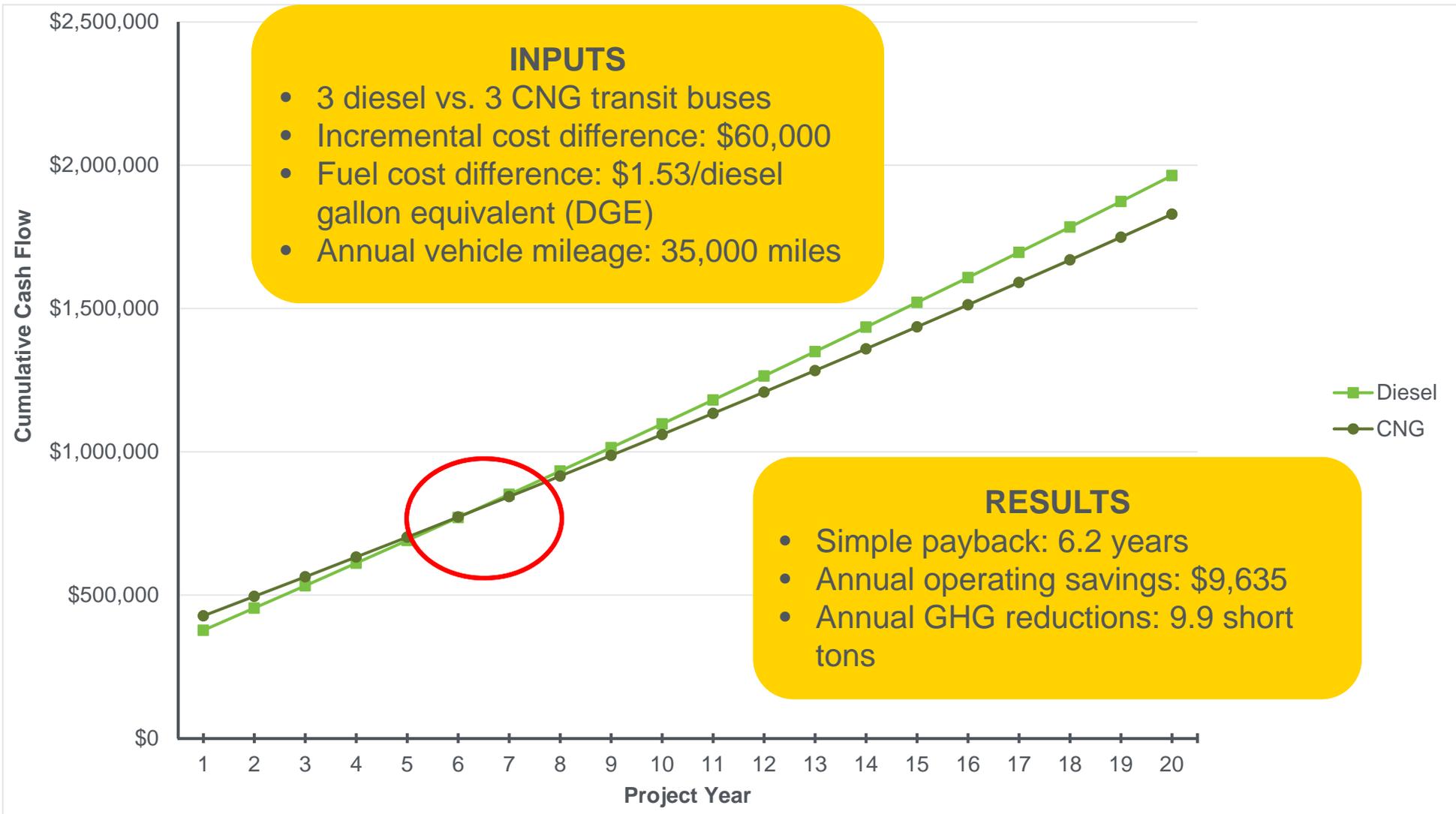
Location	Link	Biodiesel	CNG	HEV/PEV	E85	Propane
Nashua, NH	http://www.afdc.energy.gov/case/1624		✓			
Brenton Woods, NH	http://www.afdc.energy.gov/case/1763	✓				
Island Explorer, ME	http://www.afdc.energy.gov/case/1523					✓
Fort Collins, CO	http://www.afdc.energy.gov/case/1566	✓	✓	✓		✓
Boulder, CO	http://www.afdc.energy.gov/case/64	✓		✓	✓	✓
Lansing, MI	http://www.afdc.energy.gov/case/625			✓		
Brooklyn Park, MN	http://www.afdc.energy.gov/case/1142	✓		✓	✓	

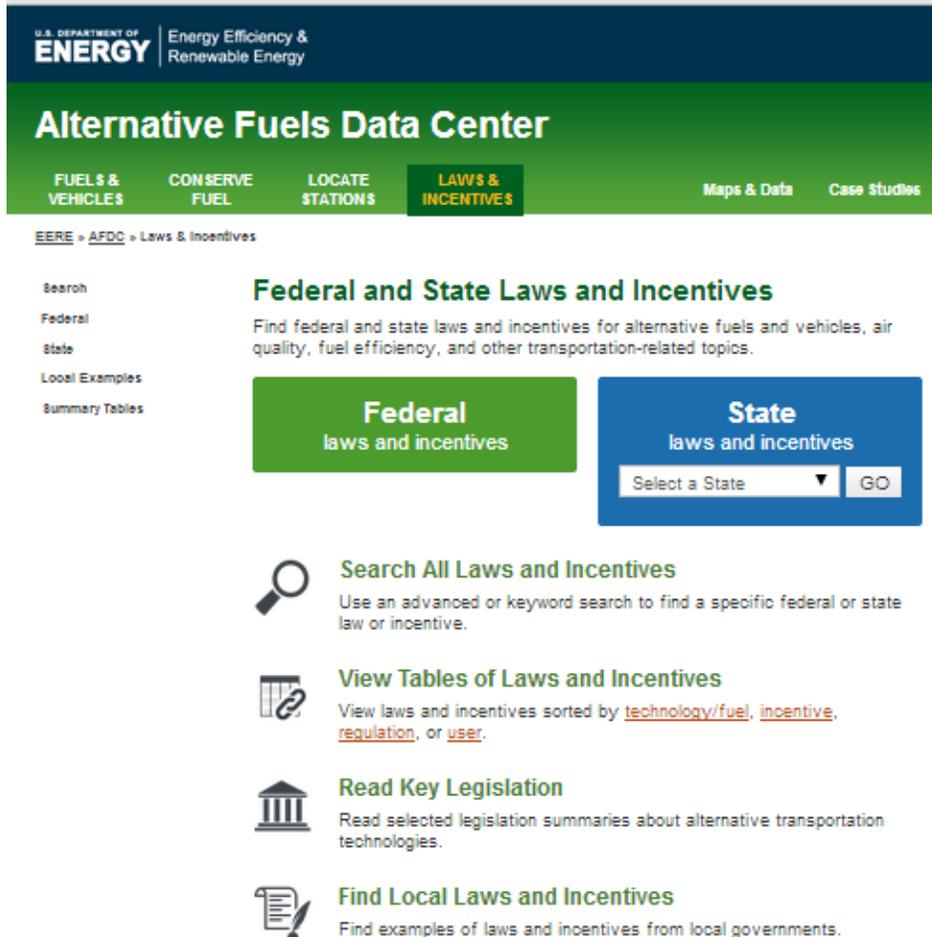
- **Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool**
(<http://greet.es.anl.gov/afleet>)
 - Compare vehicle acquisition to quantify emissions and cost benefits for project justification
 - Outputs include payback period, annual operating costs, annual emissions (GHG and criteria pollutants), total cost of ownership



The screenshot shows the Argonne National Laboratory website for the Transportation Technology R&D Center. The page is titled "Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool". It features a navigation menu with links for About TTRDC, Mission, Experts, Facilities, Tools, Publications, Awards, Media Center, and Site Index. The main content area includes a "Download tool and documentation" section with links for the AFLEET Tool 2013 (2.9 MB xlsx) and the User Guide for AFLEET Tool 2013 (609 kB pdf). A "What is AFLEET Tool?" section provides a brief description of the tool's purpose and data sources.

Clean Cities Tools: AFLEET Example Results





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

Alternative Fuels Data Center

FUELS & VEHICLES | CONSERVE FUEL | LOCATE STATIONS | **LAWS & INCENTIVES** | Maps & Data | Case Studies

EERE » AFDC » Laws & Incentives

Search
Federal
State
Local Examples
Summary Tables

Federal and State Laws and Incentives

Find federal and state laws and incentives for alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics.

Federal laws and incentives | **State** laws and incentives

Select a State GO

-  **Search All Laws and Incentives**
Use an advanced or keyword search to find a specific federal or state law or incentive.
-  **View Tables of Laws and Incentives**
View laws and incentives sorted by [technology/fuel](#), [incentive](#), [regulation](#), or [user](#).
-  **Read Key Legislation**
Read selected legislation summaries about alternative transportation technologies.
-  **Find Local Laws and Incentives**
Find examples of laws and incentives from local governments.

Laws & Incentives Database (<http://www.afdc.energy.gov/laws/>)

- Find federal and state incentives and laws for alternative fuels and vehicles, air quality, fuel efficiency, and other transportation related topics.
- Advanced search function
- Local laws and incentive examples

- **Federal Tax Incentives:**

- Qualified Plug-In Electric Drive Motor Vehicle Tax Credit: <http://www.afdc.energy.gov/laws/law/US/409>
- Hydrogen Infrastructure and Vehicle Tax Credits: <http://www.afdc.energy.gov/laws/law/US/351> and <http://www.afdc.energy.gov/laws/law/US/350>

- **DOT Funding:**

- MAP-21 provisions specifically for electric and natural gas fueling stations:
 - Congestion Mitigation and Air Quality (CMAQ) Improvement Program (Section 1113; <http://www.afdc.energy.gov/laws/law/US/284>)
 - Surface Transportation Funding (Section 1108)
 - Parking for Commercial Vehicles on the National Highway System (Section 1408)
 - Carpool Parking Facilities (Section 1513)
 - Forest Development Roads and Trails (Section 1513)

Clean Cities Tools: Laws & Incentives - CMAQ Funding for Alternative Fuels



- CMAQ funding is available for alternative fuel vehicle and infrastructure projects
- Example projects:
 - OH Diesel Emission Reduction Grant Program: <http://www.afdc.energy.gov/laws/law/OH/6163>
 - Has funded propane and natural gas school buses; natural gas dump trucks, shuttle buses, and delivery trucks; anti-idling units; and PHEV refrigerated trailers
 - NY Truck – Voucher Incentive Program: <http://www.afdc.energy.gov/laws/law/NY/10452>
 - Provides vouchers for electric drive vehicles and other AFVs, as well as diesel emission reduction devices
 - MA Clean Vehicle Project: <http://www.afdc.energy.gov/laws/law/MA/11341>
 - Will replace or convert more than 200 public and private fleet vehicles currently powered by gasoline and diesel with vehicles fueled by natural gas, propane, electricity, solar electric, and hybrid technologies
- AFDC Case Studies:
 - Fort Collins, CO CNG station: <http://www.afdc.energy.gov/case/1566>
 - Hoover, AL E85 station: <http://www.afdc.energy.gov/case/1423>

- Maine Laws & Incentives
(<http://www.afdc.energy.gov/laws/laws/ME>)
 - Alternative Fuel Tax Rates
 - NGV Memorandum of Understanding (MOU)
- Massachusetts Laws & Incentives
(<http://www.afdc.energy.gov/laws/laws/MA>)
 - Alternative Fuel Vehicle and Infrastructure Grants
 - PEV Rebates
 - Idle Reduction Requirement
- Vermont Laws & Incentives
(<http://www.afdc.energy.gov/laws/laws/VT>)
 - Alternative Fuel and Advanced Vehicle Research and Development Tax Credit
 - Biodiesel School Bus Pilot Program
 - AFV Acquisition Requirements

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- *Removing Barriers, Implementing Policies and Advancing Alternative Fuels Markets in New England*
 - Involves Clean Cities coalitions from Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
 - Workshops – CNG, Biodiesel Technicians
 - Policy Initiatives – **MPOs**, Model Language
 - Safety and Training – 1st Responder, Tank Inspection
 - Biodiesel Working Group
 - Clean Fleets Initiative



- A literature review was the first step to understanding whether planning organizations already consider alternative fuels a priority
- Included 15 total MPOs and 20 additional planning organizations in Maine, Massachusetts, and Vermont
- Reviewed planning documents including:
 - Metropolitan Transportation Plan or Long-Range Transportation Plan (LRTP)
 - Transportation Improvement Program (TIP)
 - Any other long-term plans that included a transportation component

- Compiled plans via Internet searches and outreach to planning organization contacts
- Each document was reviewed for a set of keywords related to AFVs and infrastructure
- Several planning organization documents are considered notable due to extensive information and project plans related to alternative fuels

Keywords

- alternative fuels
- alternative fuel vehicles
- idle reduction
- biodiesel
- biofuel
- biogas
- Clean Cities/Clean Communities
- clean vehicles
- compressed natural gas
- electric/plug-in electric vehicles
- electric vehicle supply equipment/charging stations
- ethanol/E85
- flexible fuel vehicles
- fuel cells
- fuel economy
- fuel-efficient vehicle
- high occupancy vehicle exemptions
- hybrid electric vehicles
- hydrogen
- liquefied natural gas
- low carbon fuels
- low emission vehicles
- methanol
- natural gas vehicles
- propane/liquefied petroleum gas/autogas
- refueling infrastructure/fueling infrastructure
- renewable fuels
- truck stop electrification
- vehicle conversions/aftermarket conversions
- zero emission vehicles

- **Massachusetts:**

- *Northern Middlesex MPO's Regional Transportation Plan*

- Aims reduce GHGs by encouraging the use of zero-emission vehicles and AFVs
- Mentions a local fleet that currently operates CNG and hybrid vehicles

- **Maine:**

- *Greater Portland Council of Governments and Southern Maine Planning and Development Commission's Sustain Southern Maine Long-Range Transportation Plan*

- Includes policy to protect environment by reducing GHG emissions
- Strategies for implementation include supporting Maine Clean Communities; converting fleets to CNG, biodiesel, and propane; establishing an EVSE network; and reducing fuel consumption
- Performance measures include sales figures for HEVs and PEVs, the number of alternative fuel stations, and fuel use figures

- **Vermont:**

- *Chittenden County MPO's ECOS Plan*

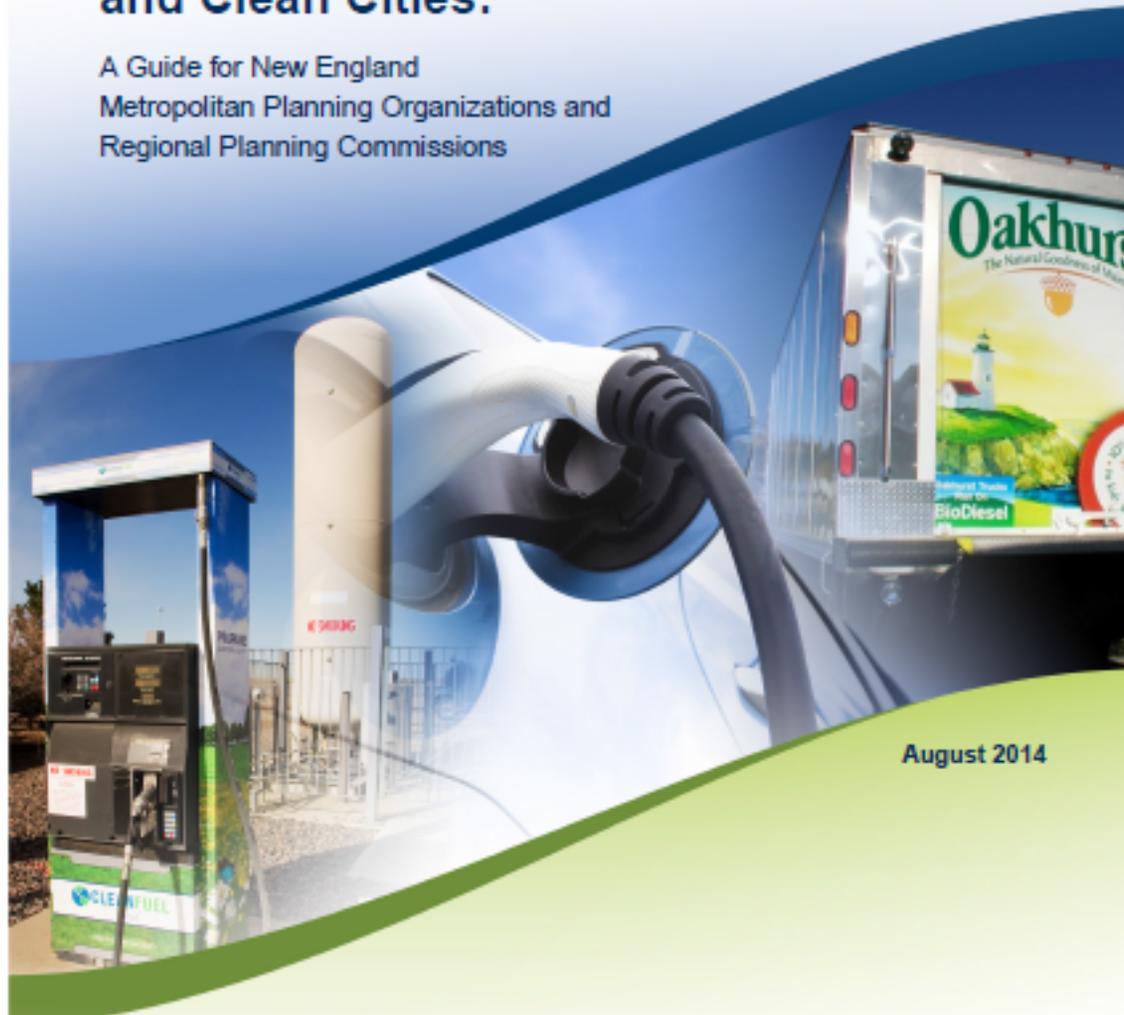
- Plans for more widespread adoption of EVs and NGVs, including future projects to develop an EVSE network

- **Maine:**
 - Long-Range Statewide Transportation Plan, *Connecting Maine*
 - *Maine Comprehensive Energy Plan*
- **Massachusetts:**
 - *weMove Massachusetts: Planning for Performance*
 - State Transportation Improvement Program
 - *GreenDOT Implementation Plan*
 - *Massachusetts Clean Energy and Climate Plan for 2020*
- **Vermont:**
 - *Vermont Long Range Transportation Business Plan*
 - *Vermont Comprehensive Energy Plan*

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Alternative Fuels, Advanced Vehicles, and Clean Cities:

A Guide for New England
Metropolitan Planning Organizations and
Regional Planning Commissions



August 2014

Contents

- Introduction
- Your Local Clean Cities Coalitions
- Alternative Fuel Basics
- Top 10 Alternative Fuel Questions Answered
- Top 10 Alternative Fuel Tools

http://issuu.com/newenglandcleancities/docs/new_england_mpo_and_rpc_guide_final

- Keep alternative fuels and Clean Cities in mind when:
 - Developing short- and long-term **planning documents**
 - Considering internal and external **funding opportunities**
 - Speaking with **stakeholders**
 - Identifying **partners** for large projects
 - Discussing new residential and commercial **development projects**

Thank You!



- Steve Linnell, Maine Clean Communities
 - slinnell@gpcog.org
 - 207-774-9891
- Steve Russell, Massachusetts Clean Cities
 - stephen.russell@state.ma.us
 - 617-626-7325
- Michelle McCutcheon-Schour, Vermont Clean Cities
 - mmccutch@uvm.edu
 - 802-656- 9864
- Alexis Schayowitz, ICF International
 - alexis.schayowitz@icfi.com
 - 617-250-4281
- Clean Cities Technical Response Service
 - TechnicalResponse@icfi.com
 - 800-254-6735

Questions?