NJ Draft Revised Energy Master Plan - Alternatively Fueled Vehicle Work Group

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New Jersey Clean Cities Coalition
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Alternatively Fueled Vehicle Work Group

Appointed by BPU, tasked with the following questions:

- **Alternative Fuels**: Within the vehicle categories of freight, mass transit and passenger vehicles, what are the most cost-effective and environmentally friendly alternatives?
- **Alt Fuel Infrastructure:** What are the opportunities and barriers to developing an infrastructure to support various alternative fuel supplies for vehicles?
- **State Fleet:** For State owned vehicle fleets, how can the state increase its energy efficiency and decrease it's reliance on petroleum-based fuels?
- **Barriers:** Are there any legislative or regulatory barriers to increasing the state's use of alternatively fueled vehicles across all sectors?

Work Group Members

- Chuck Feinberg, Work Group Chair, New Jersey Clean Cities Coalition
- Bob Fatzinger, South Jersey Gas
- Bryan Luftglass, Linde
- Darren Port, NJ Department of Community Affairs
- Dave West, NJ Department of Environmental Protection
- Dick Duffy, PSE&G
- Fred DeSanti, NJ Propane Gas Association
- Jim Schmidt, NJ Department of Transportation
- John Garvey, NJ Board of Public Utilities
- John Wohlrab, Waste Management
- Satish Tamhankar, Linde
- Steven Levy, Sprague Energy
- Ted Pomeroy, Real Estate Professional
- Wayne Wittman, PSE&G
- William Curcio, Eastern Propane

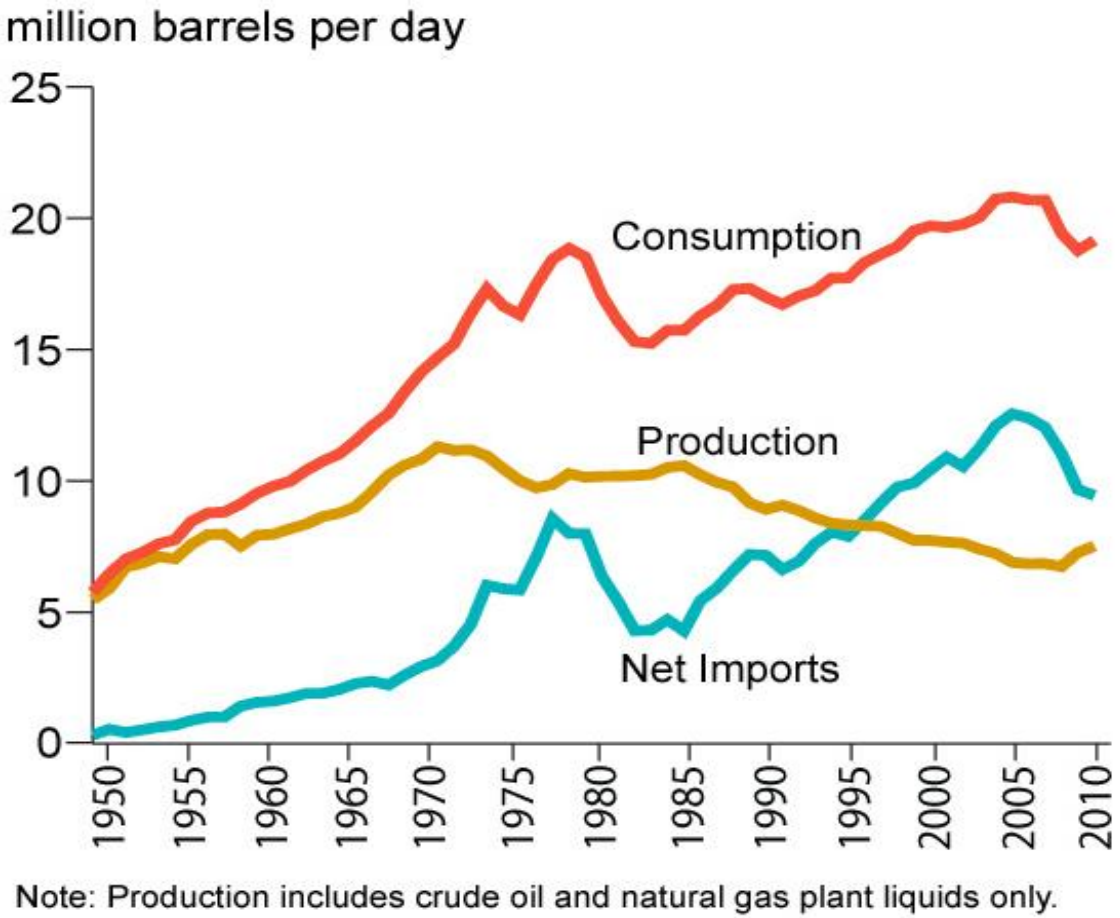
NJ Clean Cities Coalition Background

- Original DOE designation in 1997, as a NJBPU program
- Incorporated as a NJ Non-Profit and IRS 501(c)3 tax exempt entity in 2009. Re-designated by DOE in 2011.
- CNG Fleet & Infrastructure Project ($47million, including $15million DOE ARRA grant)
- Clean Cities Program Support contract with USDOE
- DOE Regional Electric Vehicle Network Planning program, with NYSERDA, Transportation & Climate Initiative, & NJDEP
- EPA Diesel Emission Reduction Program, Marine Vessel Engine Replacement
- Multiple Statewide or Regional Workgroup Participation:
  - Renewable Natural Gas (bio-methane) Work Group
  - Sustainable Jersey Green Fleet Policy Committee

Five “Overarching Goals that the State should pursue”

- Drive down the cost of energy for all customers
- Promote a diverse portfolio of new, clean, in-state generation
- Reward energy efficiency and energy conservation and reduce peak demand
- Capitalize on emerging technologies for transportation and power production
- Maintain support for the renewable energy portfolio standard

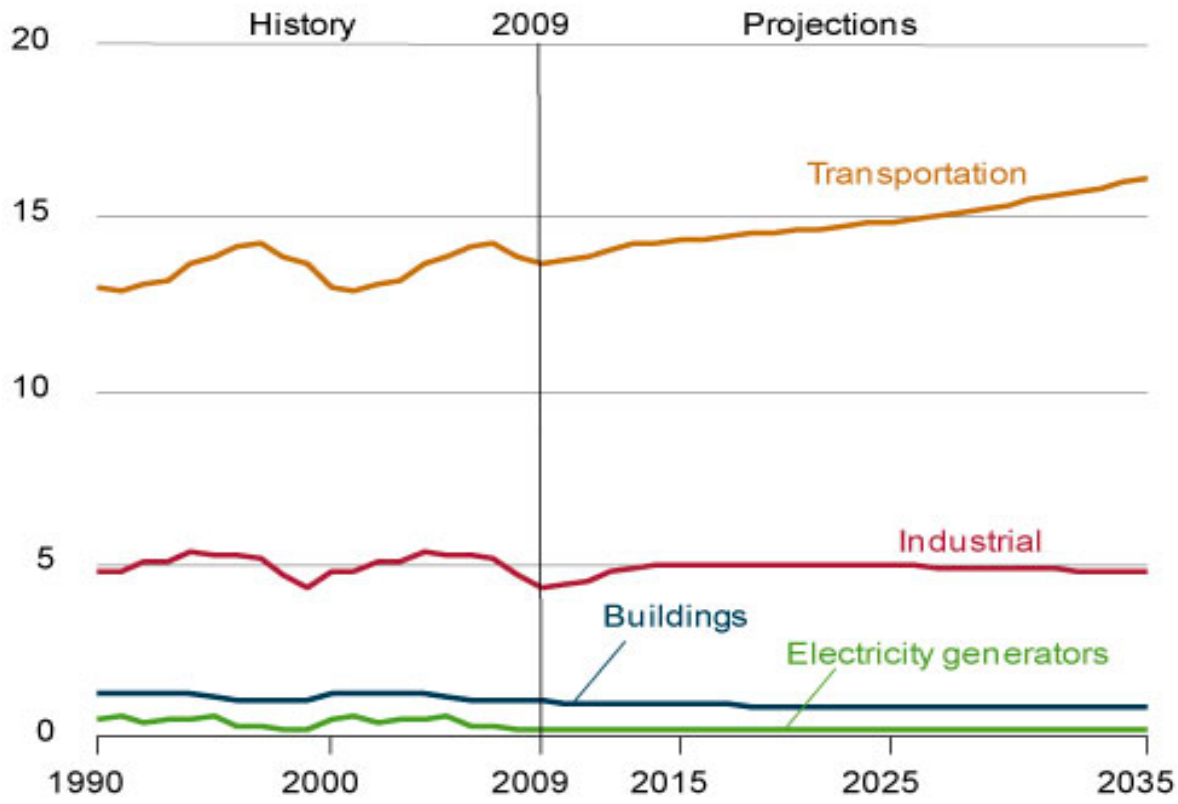
U.S. Petroleum Trends



Petroleum Consumption, Production, and Import Trends

Source: Monthly Energy Review (May 2011) and Annual Energy Review 2009. Energy Information Administration.

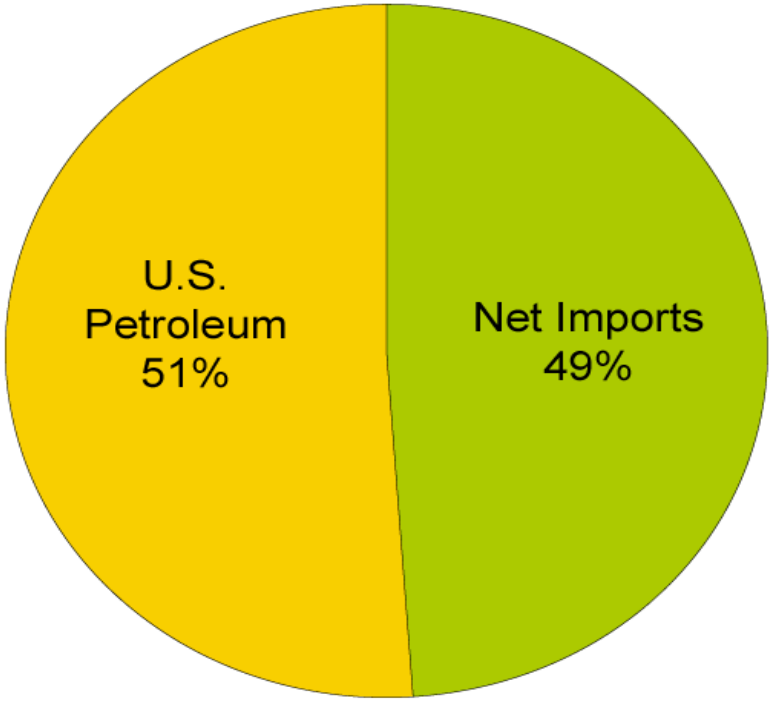
U.S. Energy Consumption



Liquid fuels consumption by sector, 1990-2035 (million barrels per day)

Source: Annual Energy Outlook 2011. Energy Information Administration.

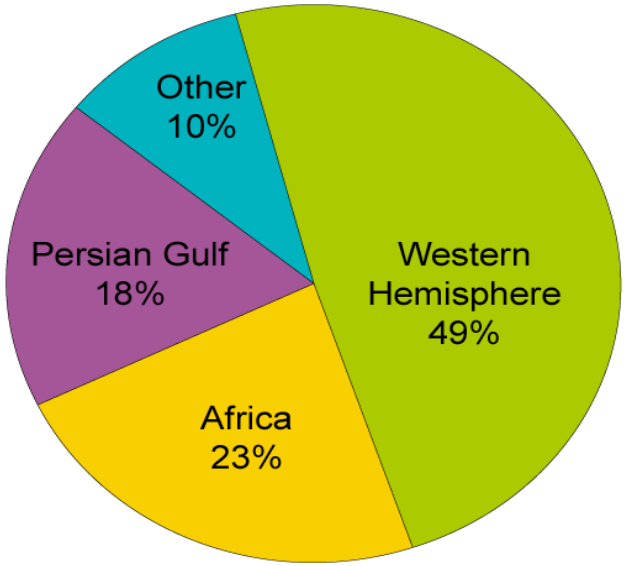
U.S. Petroleum Trends



Net Imports and Domestic Petroleum as Shares of U.S. Demand

Sources of Net Crude Oil and Petroleum Products Imports:

- Canada (25%)
- Saudi Arabia (12%)
- Nigeria (11%)
- Venezuela (10%)
- Mexico (9%)



Sources: Monthly Energy Review (April 2011). Petroleum Supply Monthly (February 2011). EIA

OIL IMPORT GROWTH

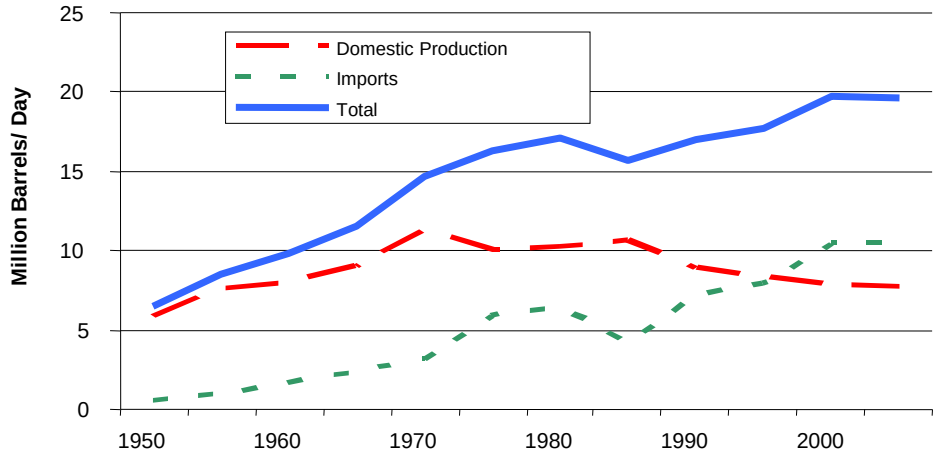
- 1947: US self sufficient - a net oil exporter to our WWII allies
- 1973: 35% of US oil imported
- 1992: 40% of US oil imported
- 2008: 58% of US oil imported

US: 5% of world's people consuming 25% of oil consumed WORLDWIDE

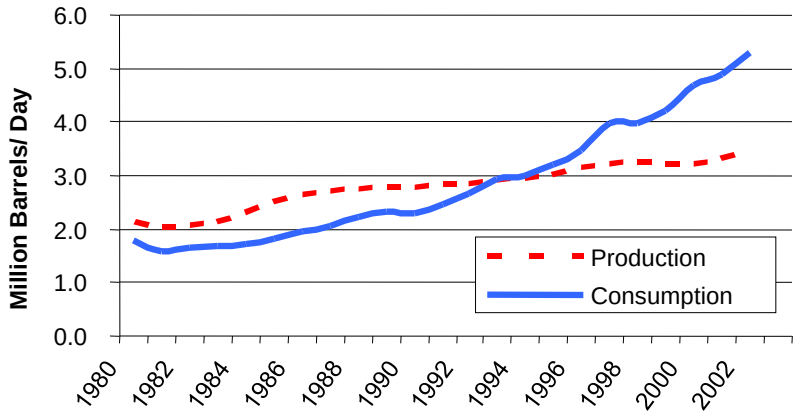
THE WORLD OIL CRUNCH!

3 countries (1/3 of all people), each with rising consumption, vie for oil

USA

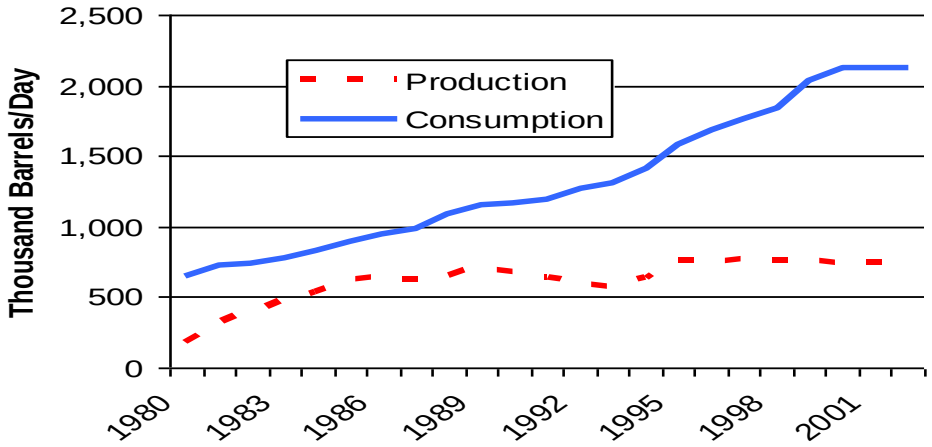


CHINA



Source: EIA

INDIA

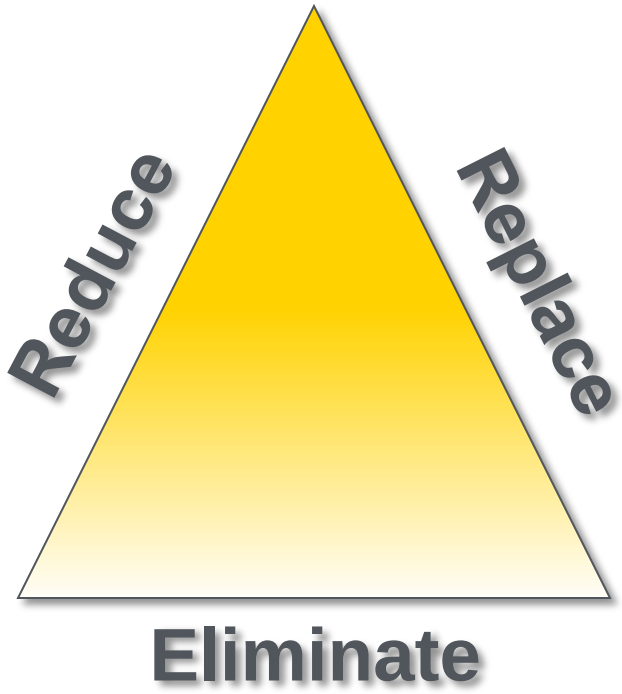


Excerpt from the EMP

"New Jersey has many options to…***lessen reliance on gasoline and diesel fuel*** as the primary transportation fuel. These energy technologies would ***reduce emissions*** of air pollutants and greenhouse gases. Active support of innovative energy technologies will ***create jobs*** as well as ***help businesses*** throughout the State." p9

Petroleum Displacement Methods

- **Replace** petroleum with alternative fuels and fuel blends.
- **Reduce** by promoting energy efficiency in vehicles through advanced technologies and more fuel efficient vehicles.
- **Eliminate** by promoting idle reduction, greater use of mass transit, trip elimination, and other congestion mitigation approaches.



Excerpt from the EMP

"Fuel source options available will vary by the nature of the transportation type but are aimed at *lessening New Jersey's dependence* on traditional gasoline and diesel fuel to propel ships, trains, trucks, buses and passenger cars in *furtherance of the State's environmental and economic objectives*." p122

A Portfolio of Alternatives Should be Supported in the EMP

Alternative and Renewable Fuels

- Biodiesel
- Electricity
- Ethanol (E85)
- Hydrogen
- Natural gas
- Propane

Fuel Economy

- Fuel efficient vehicles
- Driving habits
- Vehicle maintenance

Idle Reduction

- Technologies
- Behavioral changes

Trip Elimination

- Telecommuting
- Ridesharing

Excerpt from the EMP

"The Christie Administration is committed to change by promoting the infrastructure needed throughout the State to induce heavy duty vehicle class conversion *from expensive and polluting diesel fuel to less costly and clean* CNG…and the improvement of our electric grid which will be needed if and when the electric vehicle industry develops a market on a state and national scale." p9

Electrification: all Vehicle Classes

Pure EVs

Light

Heavy

and many more….

Plug In Hybrids


Tesla Roadster


Smart ED


Coda Automotive


Ford Focus BEV


Mitsubishi iMiEV


Ford Transit Connect


Nissan Leaf


Think EV


Smith Edison


Navistar EV


EVI Truck


Smith Newton


Toyota Prius


Ford Escape


Fisker Karma


Chevy Volt


Bright Automotive


EVI Step Van


Electrorides


Balquon HD Truck


Odyne HEV Bucket Truck

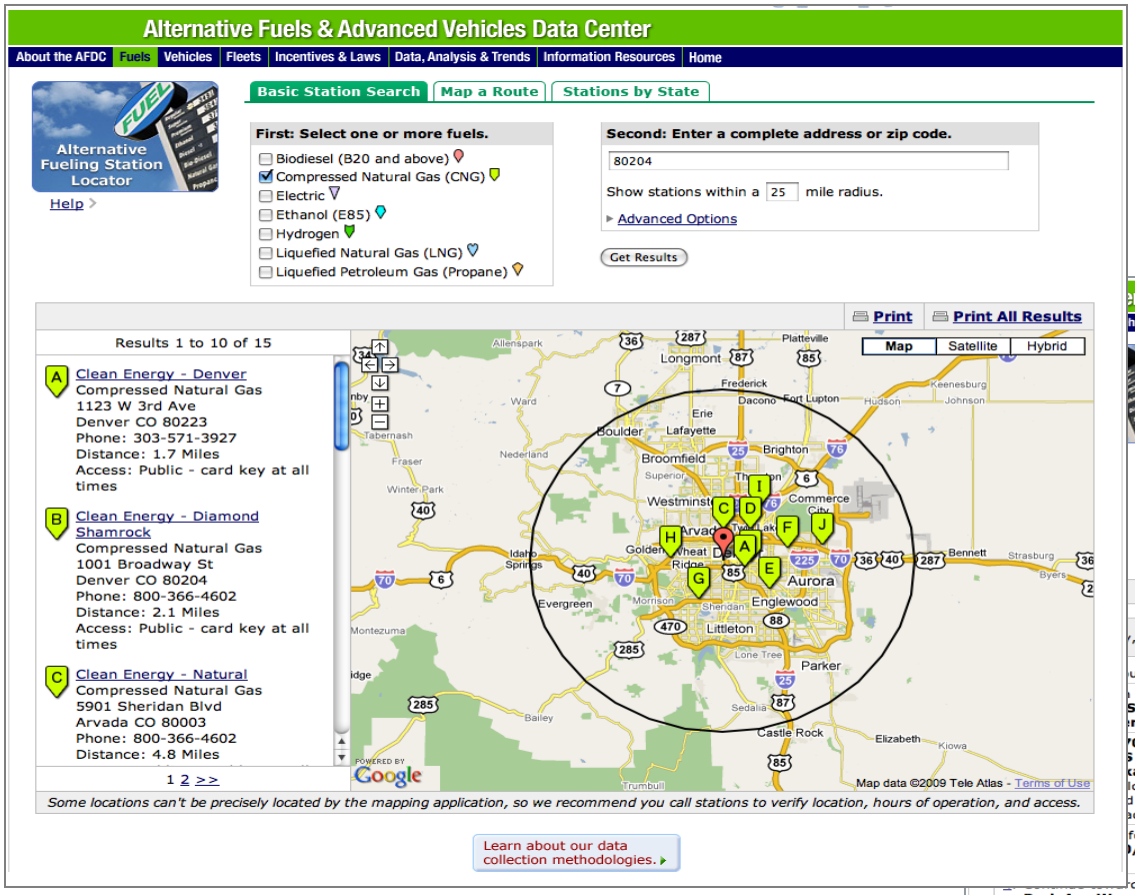
Current AFV Infrastructure in NJ

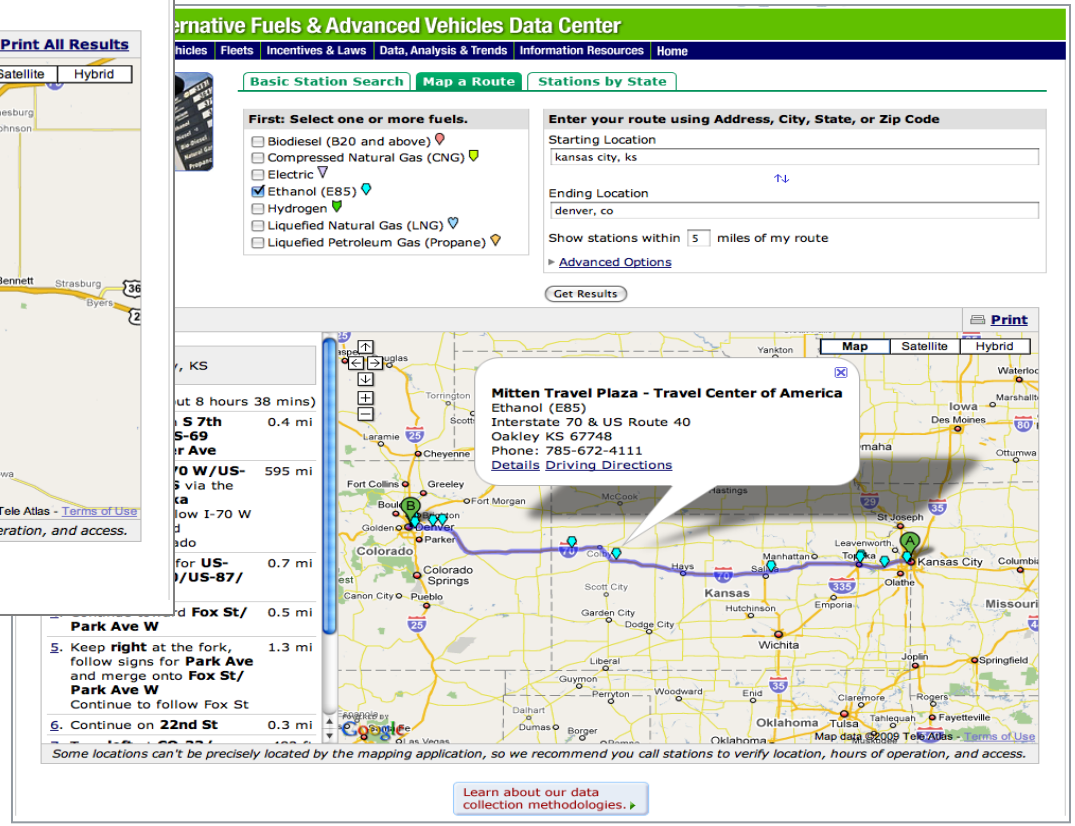
New Jersey's current infrastructure for alternative fuels consists of a total of 51 fueling locations:

- Compressed Natural Gas - 20 locations* (3 public)
- Propane - 10 locations (all public)
- E-85 - 5 locations (3 public)
- Electric - 13 locations (all public, 10 level 2, 13 level 1)
- Biodiesel - B20 or above - 3 locations (1 public)
- Hydrogen – 0
- Liquified Natural Gas – 0

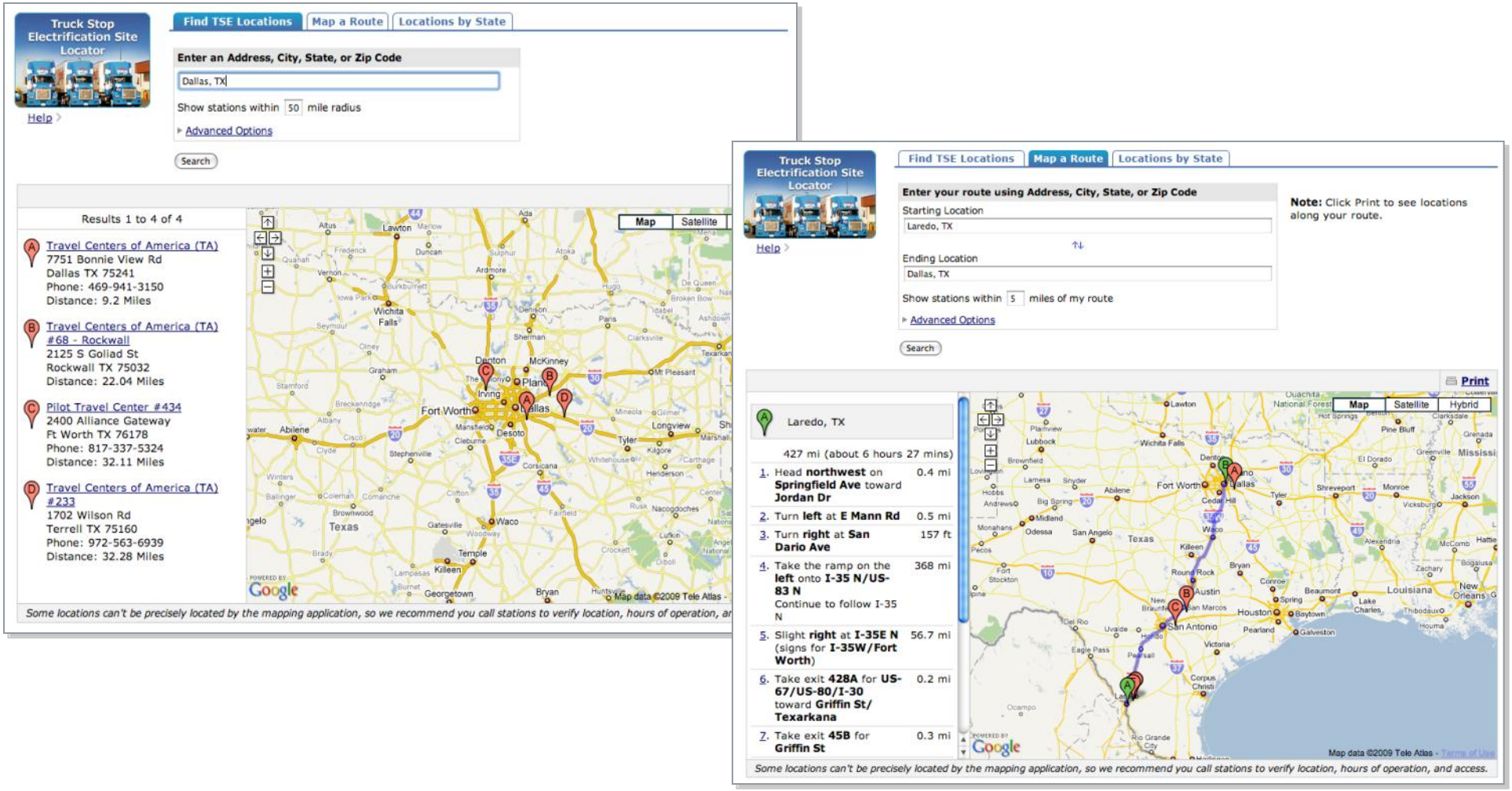
*at least 5 more to be opened in 2012

Infrastructure Tools – Station Locator





Infrastructure Tools – Truck Stop Electrification Locator



Excerpt from the EMP

"Going forward programs aimed at increasing the number of CNG truck, bus, and vehicle engines will *reduce oil use*, but increase natural gas use. New Jersey should evaluate what infrastructure changes regarding slow and fast fill stations, fleet availability and maintenance, and labor are required to retrofit existing vehicles in order to accelerate the substitution of natural gas use for oil." P.115

Infrastructure & Fleets: Barriers & Recommendations

Revolving Loans - The initial capital cost of construction of fueling infrastructure, the incremental cost of alternatively fueled vehicles, and the difficulty many entities have in obtaining credit, represent significant financial obstacles for public and private fleet managers. The State should explore the creation of a revolving loan program.

Leverage Private Capital By Encouraging Public/Private Partnerships - Utilizing private capital to build alternative fuel infrastructure, in exchange for a long-term fuel purchase agreement, would allow that infrastructure to be put in place with no capital cost to the public entity and could become a revenue producer.

Utility Involvement - Utilities, on their own and in conjunction with the private sector, need to play significant role in facilitating and promoting EV and NGV deployment and infrastructure development.

State Fleet – led by Example

- Define goals for decreasing emissions and petroleum consumption
- Develop/implement Fleet Mgm't and Alternative Fuel Implementation Plans for state owned & operated vehicles
  - Optimize fleet size
  - Reduce or "right-size" vehicle size
  - Consider life-cycle costs, not just first cost
  - Leverage private sector investment in infrastructure
  - Incorporate best practices to minimize VMT
- Measure Accomplishments in annual reduction of:
  - Gallons of gasoline/diesel displaced
  - Emissions of GHG and Critieria pollutants
  - Total fuel and operational costs.

Barriers & Recommendations

- New Jersey is only one of two states (the other being Alaska) that does not currently have a definition for biodiesel that references ASTM D6751.

- Due to the unique design configuration of school buses in NJ, CNG school buses have not advanced as quickly in NJ as they otherwise might have.

- The development of CNG infrastructure in large parts of northern and central New Jersey is inhibited due to the fact that off gases from one or more refineries is mixed with pipeline gas.

Barriers & Recommendations

Zoning and permitting of all alternative fuel infrastructure needs to be simplified and streamlined. Local jurisdictions and multiple authorities having jurisdiction on single projects delay installation of infrastructure.

State Contract - The process for including AFVs and fuels on the State Procurement Contract should be reviewed. Provisions should also be reviewed to assure that group purchase discounts available to gasoline & diesel can also be put in place for alternative fuels. The vehicle procurement process should consider "total cost of ownership" instead of lowest capital cost bid.

Barriers and Recommendations

- EV infrastructure dispensers should be treated as entities that provide service as a motor fuel rather than as resellers of electricity. Regulations should also cover items like safety, interoperability, reliability of equipment and services, and coordination and involvement of local EDCs.
- The institution of a Motor Fuels Tax on alternatively fueled vehicles should be evaluated. The State should consider setting the Tax low for a period of time, or until certain deployment targets are met, to spur market development. Consider new approaches such as a VMT tax.
- Light-duty ZEVs are exempt from state sales and use tax. Consideration should be given to extending the partial exemption to plug-in hybrid vehicles achieving a minimum electric-only range, and to pure electric medium- and heavy-duty trucks and other AFVs.

NJCCC DOE Grant Summary

- NJCCC is leading a public/private team to implement the first large-scale deployment of AFVs and infrastructure in NJ
- Convert approximately 300 heavy duty vehicles to CNG (trash collection trucks and shuttle buses)
- Install CNG fueling stations, which ultimately will be available to other fleets. Stations across the state in the service territories of PSE&G, South Jersey Gas and NJ Natural Gas.
- Base program will displace almost 2 million gallons of petroleum and avoid more than 900,000 pounds of identified criteria pollutants and greenhouse gas emissions per year

NJ Clean Cities Grant Participants

A great example of a Clean Cities public/private partnership in operation!

Grant Partners:

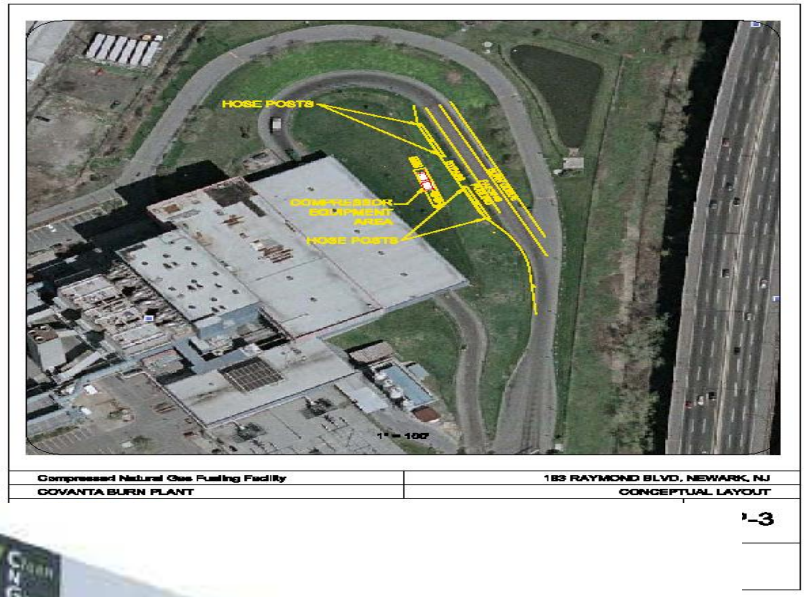
- Atlantic County Utilities Authority
- Waste Management of NJ
- Clean Energy
- Atlantic City Jitney Association
- Central Jersey Waste & Recycling
- Blue Diamond Disposal
- Suburban Disposal
- The Parking Spot Group
- Regional Industries

Select Other Stakeholders:

- Port Authority of NY/NJ
- Atlantic, Essex & Morris Counties
- NJ Casino Reinvestment Development Authority
- Federal Transit Administration
- NJ Transit
- Township of Mt. Arlington
- Cities of Camden, Trenton & Newark
- South Jersey Gas
- NJ Natural Gas
- Public Service Electric & Gas

NJCCC ARRA-Grant Funded Vehicles

NJCCC DOE ARRA funded Infrastructure Projects



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