



# *Fleet Funding Opportunities and Case Studies*

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NC Project Green  
Sustainable Motor Fleet Meeting  
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# This Presentation

- ~ **Who we are**
- ~ **Why this is important**
- ~ **Success Stories**
- ~ **Developing a “ Greener Fleet”**
- ~ **Incentives**



# Who are we? NC Solar Center

- Part of the College of Engineering at NC State University,
- grant /contract/state appropriated funding
- Created in 1988 & serves as clearinghouse for information, training, technical assistance deployment, demonstration and applied research
- Example programs: solar, wind, biomass, sustainable building, combined heat and power, and ***clean transportation***





# Education, Outreach & Recognition

- **Fact sheets & Technology Options Information**
  - Technology overview, news, incentives, meetings, annual conferences, events etc
  - Posted on [www.cleantransportation.org](http://www.cleantransportation.org)
- **Mobile Clean Air Renewable Energy ( CARE)**
  - an statewide initiative to recognize exemplary efforts to accelerate use of alt fuels & advanced transportation technologies.
  - 2007 & 2008 awards for Individual, Fleet, Product Provider & Policy Categories
- **Technical Assistance Program (TAP)**
  - Presentations about transportation technology options
  - Individual consultations to assess and evaluate specific fleet applications including costs and emissions/petroleum displacement benefits





# Why is this Important?

**Air quality:** affects our health & health of planet

**Energy Security:** Cost of petroleum increases as it runs out

**Mandates:** State and federal laws require that we take action

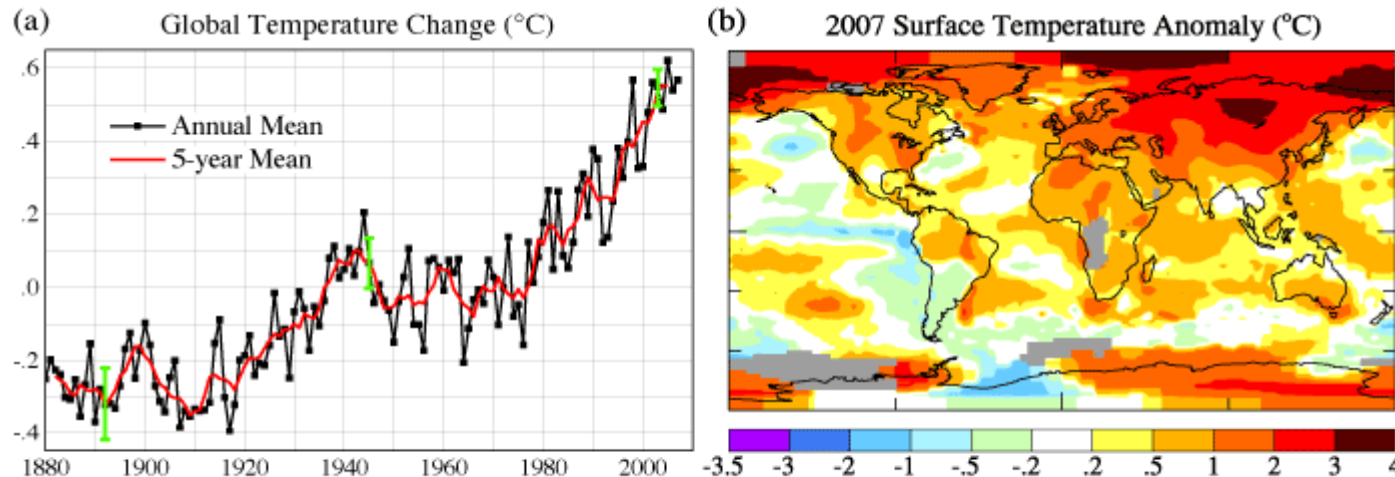
**Incentives:** Encourage us to take action



## CO<sub>2</sub> and Climate Change

- Greenhouse Effect: increased levels of CO<sub>2</sub> in the atmosphere trap solar radiation
- The earth warms...

**TOP 5 WARMEST YEARS  
WORLDWIDE SINCE THE 1890s**



Source: NASA

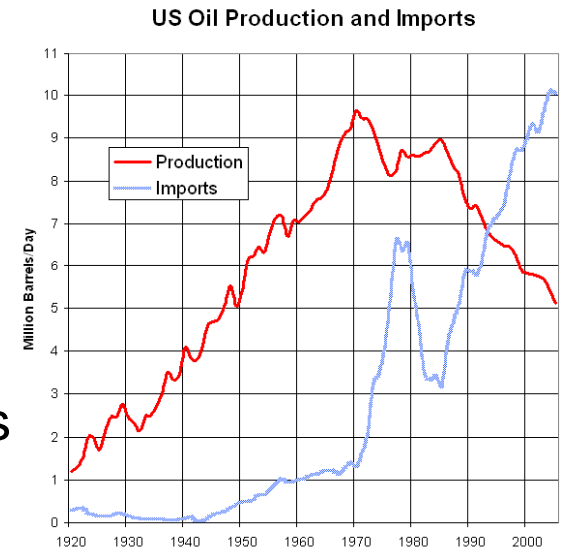
<http://data.giss.nasa.gov/gistemp/2007/>



## Petroleum Supply & Demand

- Supply

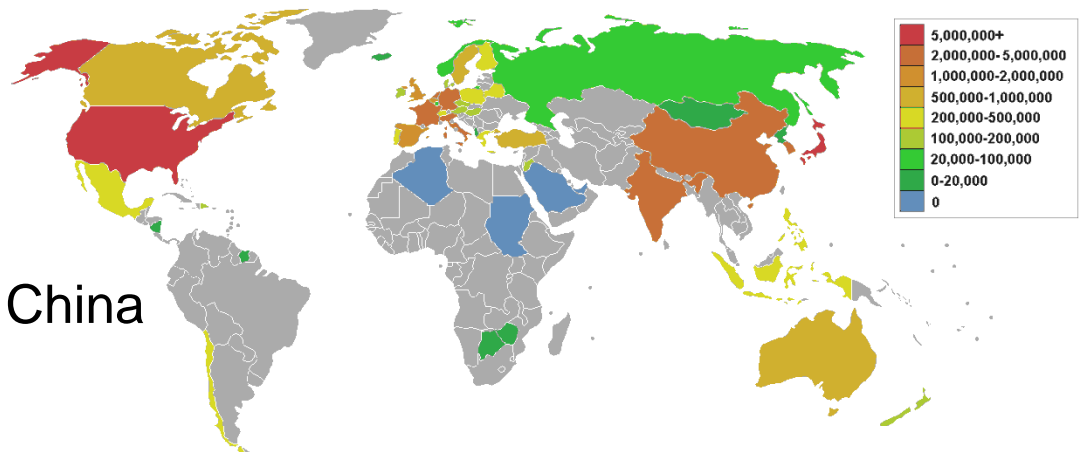
- 65% of proven reserves are in the Middle East
- US production peaked in 1970, world production may peak soon
- May need to resort to unconventional sources such as Tar sands or Oil shale



- Demand

- World population growth
- US uses 25% of world oil with only 4.5% of the population
- Industrialization of India & China

Oil imports in bbl/day





# State Petroleum Displacement Plan

## Session Law 2005-276

- All State agencies, universities, and community colleges that have State-owned vehicle fleets shall develop and **implement plans to achieve a twenty percent (20%) reduction or displacement of the current petroleum products consumed by January 1, 2010.**
  - The plan shall not impede mission fulfillment of the agency.
  - A State-owned vehicle fleet consists of more than 10 motor vehicles, designed for highway use and titled to the aforementioned entities.
  - Specialty vehicles, that are used for educational or emergency purposes are subject to ten percent (10%) reductions.
  - Agencies shall report annually by September 1<sup>st</sup> to the Department of Administration (DOA) on the efforts undertaken to achieve the reductions and the DOA shall compile and forward a report to the Joint Legislative Commission on Governmental Operations.



# State PDP Requirements

- The total petroleum use is **26.9** million gallons<sup>^</sup> for FY 2004-2005 baseline year
  - <sup>^</sup>Includes adjustments (equal to the percentage increase in mileage) from ten organizations that justified their expanded fleet use
- The petroleum reduction goal is **4.6** million gallons
  - This is an 17.5% reduction accounting for the 6,409 emergency/educational vehicles that only have to meet a 10% displacement



# State Vehicles

- Current total = 30,285

- Fleet increases since FY 04-05
  - FFVs: 2,203
  - Diesels: 588
  - Elec: 95
  - Hybrid: 57

Vehicle Types	FY 2004-05 Baseline yr	FY 2007-08	
	#	#	% change
Gasoline	10,816	11,412	6%
Hybrid	78	135	73%
Flex-fueled Vehicles	4,752	6,956	46%
Comp Natural Gas	14	12	-14%
Diesel	4,498	5,086	13%
Propane	192	169	-12%
Emergency/Ed (10%)	6,007	6,409	7%
Electric	13	108	731%
<b>Total</b>	<b>26,370</b>	<b>30,285</b>	<b>15%</b>

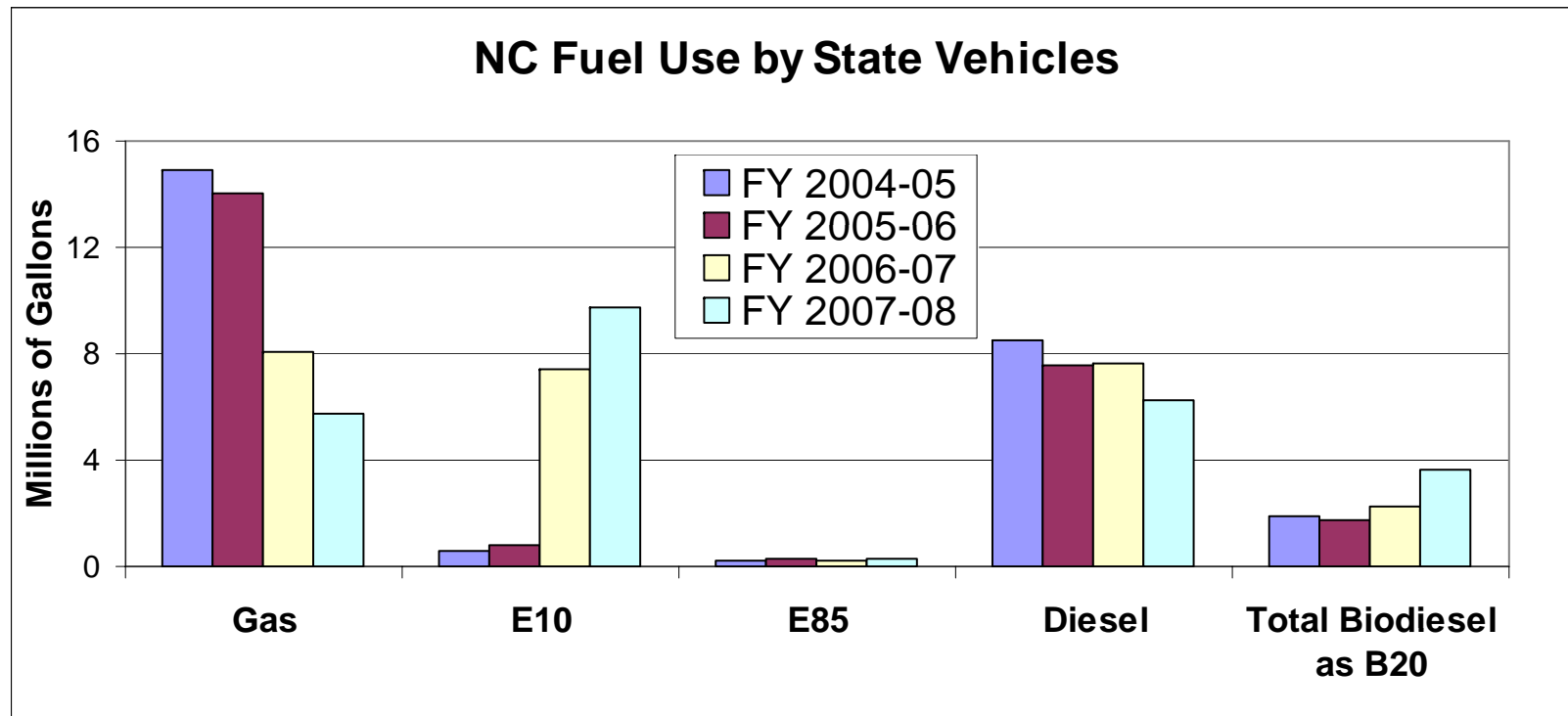


# State PDP FY 2007-08 accomplishments

- Total petroleum use in FY 2007-08 was 23.8 MGs- a reduction of 2.3MG or 8.72 % (of adj.baseline)= to 50% of the total PDP goal of 17.5%
- ✓ 3.4 % was displaced through E10 use
- ✓ 1.3 % was displaced through biodiesel use
- ✓ 0.2 % was added through a decrease in CNG and propane use
- ✓ 0.1% was displaced through an increase in E85 use.
- ✓ 4.12% *may* have been displaced through conservation and efficient vehicles although this is more difficult to substantiate than biofuels use



## Fuel Usage



- ✓ E10 increased by more than a factor of 16, from 600,000 gals to 9.7M gals
- ✓ Biodiesel (B5 -B100) increased from 1.87 MG to 3.64 MG B20 .
- ✓ E85 use increased from 242,000 gals to 263,000 gals.



## Reduction in Miles

- Combining trips
- Carpooling
- Adjusting routes
- Video and tele-conferencing (webinars)
- Public Transit
- Biking or Walking
- Staffing Adjustments





# Conservation



- Elimination of unnecessary idling
- Lower speeds and slower accelerations
- Using overdrive gears and cruise control
- Removing excess weight
- Proper maintenance
  - Regular oil changes with correct oils
  - Frequently changing air filters
  - Correctly inflated tires
  - Reporting of decreased performance





# Efficiency

- Purchasing more efficient conventional vehicles
  - Cars & vans typically get better mpg than SUVs or trucks
  - Smaller engines (4-cylindar) save fuel
- Choosing the proper vehicle for the task
  - Depending on number of passengers
- Hybrid Electric Vehicles (HEVs)
  - The lower operating costs (due to higher mpg) will compensate for the increased incremental cost over it's lifetime, especially for city driving
  - Some power-hybrid models have auxiliary electricity that may eliminate the need for idling





# Neighborhood Electric Vehicles (NEVs)

- NEVs have electric motors and batteries that are recharged by plugging into 110 volt outlets
- NEVs are “street legal” and can be driven on public roads of 35mph or less
- Silent operation
- Excellent for short distance of people, equipment, and food.
  - Airports, Parks, Campuses, Meter Maids,
- A light duty vehicle that can haul up to 1,000 lbs.





# An NEV Success Story: UNCC



Per Vehicle Cost  
\$10,400-\$16,000

Over \$1,100 per vehicle fuel savings plus reduced maintenance costs

*2008 fleet:*  
68 Electric NEVs & LSVs  
8 E85 off road utility vehicles

UNCC Facilities Management relies on small transporter units for:

- Maintenance
- Grounds Keeping
- Construction

By moving to Neighborhood Electric Vehicles, UNCC has substantially reduced:

- operating costs
  - pollution (fuel and noise)
  - cost to complete projects



# Natural Gas (CNG)

- Comprised of methane, natural gas has the lowest carbon density of all fossil fuels
- Primarily domestic: extracted from wells and transported through 1.3 million miles of pipelines
- NG widely used in industrial and home applications, personal CNG compressors are available ( Phill)
- New Vehicles can be Dedicated or Bi-fuel
- Many conventional gasoline vehicles are up-fitted to run on CNG
- Fueling costs are less than with gasoline ( about  $\frac{1}{2}$ ) and depending on fuel volume, companies will install refueling in exchange for long term fuel contract



# CNG Success Story: Edgecombe County

- After being designated a non-attainment area, Edgecombe county immediately began seeking methods of reducing emissions.
- Installed Fuel Maker CNG refueling appliance
- Purchased 6 Honda Civic GX vehicles (recognized by the EPA as the cleanest commercially-available internal combustion vehicle in the world, reducing VOCs and NOx by 87%, CO by 70%, and CO2 by 20%.
- The 6 vehicles represent 15% of the county's fleet, offsetting 15% of its gasoline use.
- New CNG vehicle assigned to Environmental Health, Water Department (reading water meters) & Home Health and Hospice replacing older ,less fuel efficient vehicles





# Recommendations

- Implement initiatives to encourage conservation
  - develop internal incentives
- Replace older vehicles with more fuel-efficient ones,
- Encourage the use of alternative fuels
  - E10 and B20 available on State purchasing contract
  - 1<sup>st</sup> Q FY 08-09 E10 avg - \$ .06 & E85 avg \$.63 less than gasoline ( Wake Co pricing averages)
- Develop bid procedures and purchasing policy that ensure fuel-efficient and alternative fueled vehicles
  - i.e full life cycle costing
- Develop a green fleet policy



# How do we adopt a “green fleet” policy?

- **Option 1: (From the top)** Pass a City/County wide *ordinance*, or enact an executive order, that codifies the “green fleet” process and delegates specific responsibilities within local government to take action.
- **Option 2: (From the bottom)** Establish internal departmental or agency fleet policies, which are clear and carry sufficient weight with departmental or agency heads.
- **Option 3: (Hybrid of 1 & 2)** Pass a *resolution* that serves as enabling legislation for establishing a “green fleet” policy, and then work out the details of the policy at the departmental or agency level.

. Visit for more info: [www.iclei.org](http://www.iclei.org)  
[www.seattle.gov/mayor/climate](http://www.seattle.gov/mayor/climate)





# Green Fleet Ordinance template

- Section 1: Establish the basis for the ordinance
- Section 2: Define important terms within the policy
- Section 3: Establish a procedure to conduct a fleet inventory
- Section 4: Set goals you want the “green fleet” policy to achieve
- Section 5: Outline the strategies your fleet will employ
- Section 6: Establish a way to monitor and enforce the policy

*NC Example: City of Winston Salem*



## State and Local Resources

- Clean Cities Coalitions
  - Triangle Clean Cities Coalition [www.trianglencleancities.org](http://www.trianglencleancities.org)
  - Centralina Clean Fuels Coalition (Charlotte) [www.4cleanfuels.com](http://www.4cleanfuels.com)
  - Land of Sky Clean Vehicles Coalition (Asheville) [www.landofsky.org](http://www.landofsky.org)
- State Energy Office [www.energync.net](http://www.energync.net)
- North Carolina Solar Center [www.cleantransportation.org](http://www.cleantransportation.org)





# National Resources

- US EPA
  - Alternative Fuels [www.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm](http://www.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm)
  - Green Vehicle Guide [www.epa.gov/autoemissions](http://www.epa.gov/autoemissions)
- US DOE
  - Alternative Fuels Data Center [www.eere.energy.gov/afdc](http://www.eere.energy.gov/afdc)
  - Clean Fleet Guide [www.eere.energy.gov/afdc/fleets/index.html](http://www.eere.energy.gov/afdc/fleets/index.html)
- National Biodiesel Board [www.biodiesel.org](http://www.biodiesel.org)
- National Ethanol Vehicle Coalition [www.e85fuel.com](http://www.e85fuel.com)
- Electric Drive Transportation Association  
[www.electricdrive.org](http://www.electricdrive.org)



# Funding Opportunities

- North Carolina Department of Air Quality Mobile Source Emission Grants

- Apply Oct 1-Dec 31, awards announced in March

- [http://daq.state.nc.us/motor/ms\\_grants/](http://daq.state.nc.us/motor/ms_grants/)

Upcoming opportunities:

- Approx \$3M to be distributed in grants from the Biofuels Center of NC

- \$27.6 million in EPA Clean Diesel program grants will be distributed by EPA's ten Regional offices.

List of current funding opportunities at

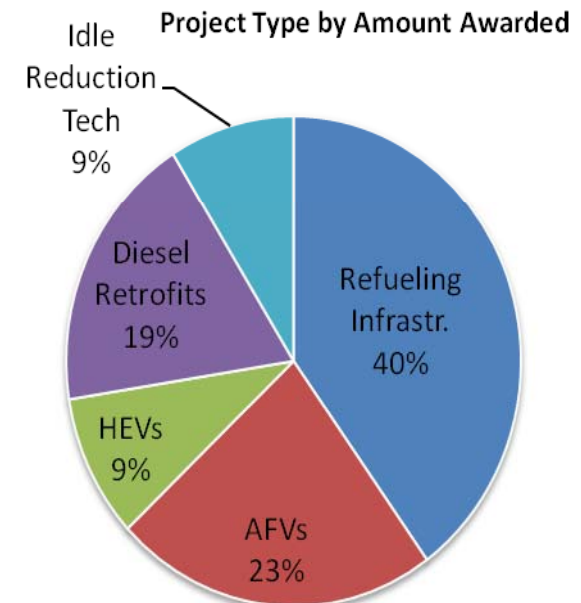
[www.cleantransportation.org](http://www.cleantransportation.org) under FUNDING



## Clean Fuel Advanced Technology (CFAT) 2005-08

**NC Solar Center awarded \$2M in funding from NC DOT, DAQ, & SEO for 3 yr project- more than \$1.4M is being distributed for emission reduction projects with funding recipients contributing over \$1.2M in cost-share**

- Up to 80% of project costs for alternative fuel vehicles, refueling infrastructure, idle reduction technologies, heavy duty hybrid electric vehicles and diesel retrofits
- Thirty public and private entities including a national park, local governments, school systems, service station owners and a company providing electrified parking spaces to reduce idling in long haul trucks have been funded



In process of applying to NCDOT for \$1M-\$1.6M to fund 2009-2011 CFAT

Contact NCDOT Board members to demonstrate interest in this program:

<http://www.ncdot.org/includes/download/external.html?pdf=http%3A//www.ncdot.org/download/about/board/boardDirectory.pdf>