



Sustainable

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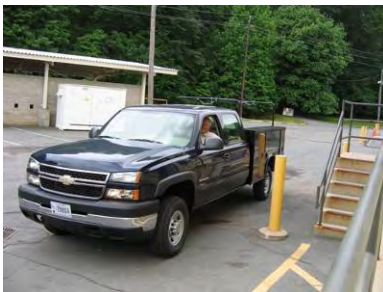
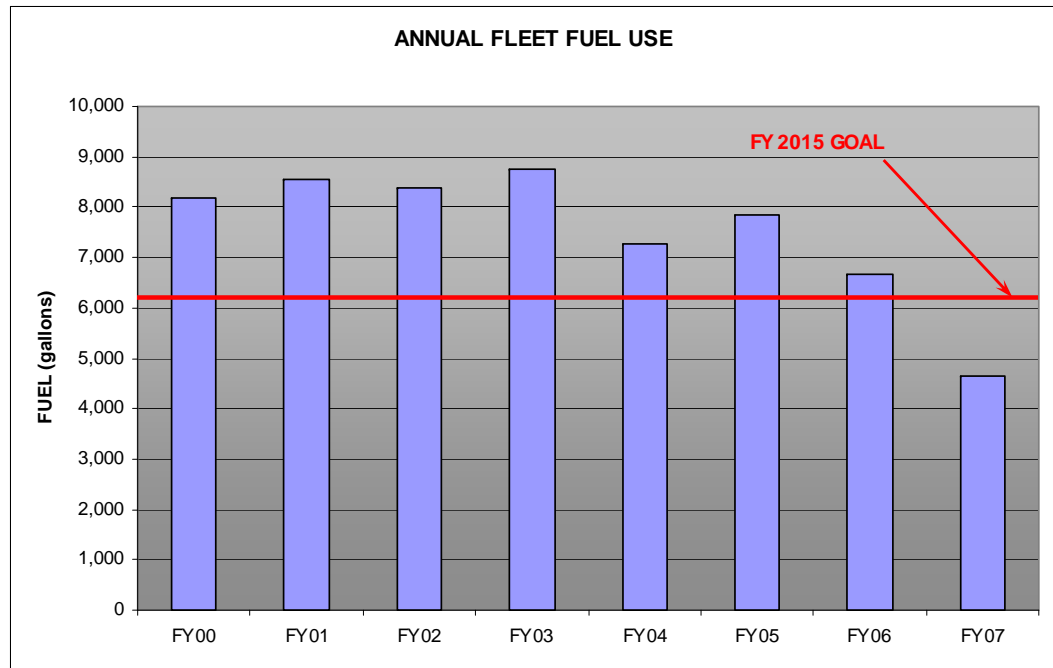
PPPL's Integration of Sustainable Fleet Management Practices into EMS

Prepared by the DOE Princeton Plasma Physics Lab
Materiel & Environmental Services Division
for June 5, 2008 Workshop



Environmental Fleet Management Improvement

- **Reduced fleet petroleum fuel use by 44% from FY2005**
- **Increased use of alternative vehicle fuels by ~900%**
 - Compressed natural gas (CNG)
 - B-20 fleet conversion
 - B-20 John Deere® “BioGators”
 - Flex-fuel vehicles





Alternative Fuels – Our Fleet Status

DOE Vehicles

- Using B-20
 - 9 John Deere Gators
 - 1 John Deere Backhoe
 - 1 John Deere Skid Loader
 - 1 Hyster 15 ton forklift
- Petro Diesel
 - 2 Fire trucks
 - 2 Mobile Cranes

30 of 45 [67%]
Alternative Fuels

GSA Vehicles

- Using B-20
 - 3 P/U trucks – Ford and Chevy
 - 2 IH Stake Body trucks
- Natural Gas
 - 3 P/U trucks
- E-85 Capable
 - 2 Sedans
 - 2 Minivans
 - 5 P/U trucks
 - 1 SUV
- Petro Diesel
 - 1 Ambulance
 - 1 Tractor
- Gasoline
 - 5 Panel trucks
 - 3 P/U trucks
 - 1 Van



PPPL's CNG Results

Fiscal Year	CNG Vehicles Usage Therms	% Increase from Base Year
FY05	263.40	Base Year!
FY06	658.74	150%
FY07	2,174.98	726%

PPPL's usage of only three (3) CNG Pick Up Trucks vehicles reduced our consumption of 1,740 gallons of gasoline in only FY07!

Best websites for Alternative Fuel Vehicles Info:

http://www.eere.energy.gov/afdc/price_report.html

<http://www.eere.energy.gov/afdc/>





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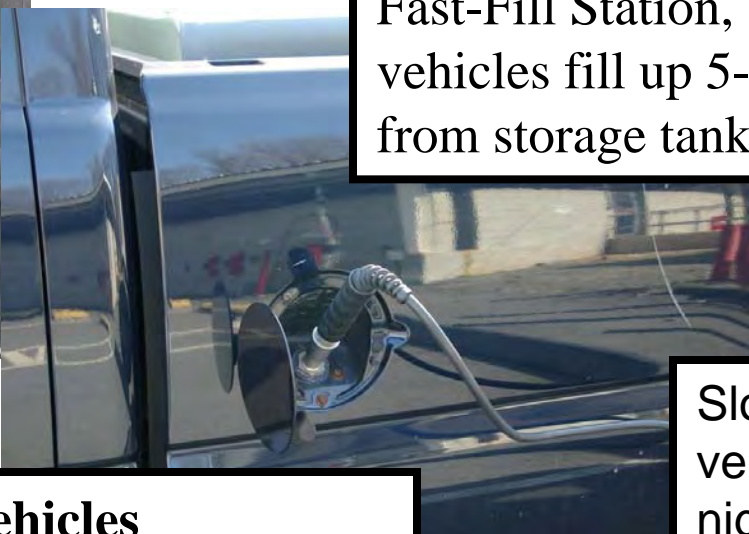
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PPPL's CNG System



Fast-Fill Station, 1999,
vehicles fill up 5-7 minutes
from storage tanks.



Slow-fill station, 1994,
vehicles fill-up over
night (8 hrs).



Advantages of CNG Vehicles

- 60-90% less smog-producing pollutants
- 30-40% less greenhouse gas emissions
- Less expensive than gasoline
- Nearly 87% of U.S. natural gas used is domestically produced



PPPL's B-20 System



EPA tested emissions from vehicles powered by B-20 and found these environmental benefits:

- **20 % reduction in unburned hydrocarbons**
- **12 % reduction in carbon monoxide**
- **12 % reduction in particulate matter**
- **20 % reduction in sulfates**

Purchase B-20 from local vendor – Taylor Fuels

- Stored and dispensed from 55 gallon drums
- Cold weather blend: VERY IMPORTANT!!!
- Drums stored in HazStore – NFPA rated shed
- Dispensed using battery powered pump



First: B-20 in BioGators

- Partnered with John Deere
- Maintenance
 - Filters
 - Oil change
 - Monitor hoses/seals
- Cold weather blend
- Training & Buy-in
- Utilized for varied tasks
- Monitor use - log book





- First ever use of B-20 in JD BioGators
- Originally purchased 5 BioGators to replace old utility vehicles. PPPL now has 9 BioGators.
- Run on B-20
- Jerome Berreth – Consumer Products – Head of Component Development – Engines
- Yan Mar Diesel – Engine Manufacturer
- Developed more stringent maintenance – 50%
 - Oil changes
 - Filter – oil and fuel changes
 - Injector cleaning



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PPPL's Biodiesel B-20 Vehicles

For 18 months 15 of PPPL's diesel powered vehicles have been powered by B-20 Biodiesel. From October 2006 to March 2008, PPPL has consumed 1,500 gallons of B-20.





Permanent B-20/E-85 Storage Tank

The temporary B-20 filling station will be replaced with a permanent B-20 [500 gallon tank] & E-85 [500 gallon tank] and filling station.



- Planned installation summer 2008
 - Includes dispensing pumps & all SPCC items
 - Ref site: <http://www.eere.energy.gov/afdc/ethanol/index.html>



Replaced Ethylene Glycol [EG] with Propylene Glycol [PG]



All (16) DOE Vehicles use SIERRA coolant. The ethylene glycol was properly disposed.

<http://www.sierraantifreeze.com/>





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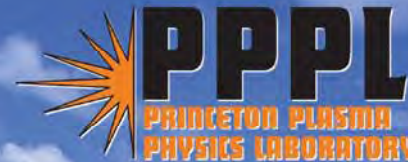


Large drip pan is actually a four drum storage spill container

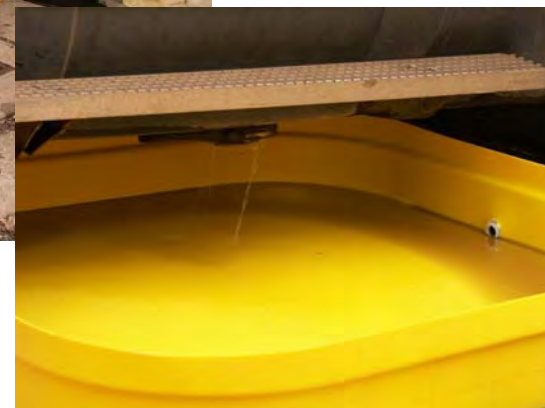


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Large Drip Pan can be utilized for Emergencies!!!



Eagle 4-Drum Budget Basin
Model 1638
www.eagle-mfg.com



Maintain Your Sustainability!!!

- Perform EMS Aspects & Impacts Analysis on Vehicle Fleet Operations

Princeton Plasma Physics Laboratory – Environmental Management System (EMS)

Activity Form for

Environmental Aspects, Impacts, and Significance Assessment

- All fuel storage tanks and operations **MUST** be included in your SPCC
- Be open to suggestions & changes which will reduce energy consumption & prevent pollution
- Future Vehicle Fleet Biobased Fluid Plans:
 - Hydraulics
 - Transmissions
 - Lube Oil



Contacts

- Operations & Maintenance of Vehicle Fleet & Fuel Systems:
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- Installation of CNG Systems:
 - Thomas J. McGeachen, tmcgeachen@pppl.gov
- Installation of B-20 & E-85 Systems:
 - Keith Rule, krule@pppl.gov