West Chester University’s Alternative Fuel Vehicle Program
Compressed Natural Gas
BioDiesel B20

University Garage
West Chester University
West Chester, PA.
Larry Krackov 3/2012
West Chester University of Pennsylvania
Founded 1871

Pennsylvania State System of Higher Education (PASSHE)
Fourteen Universities owned and operated by the Commonwealth of Pennsylvania
Approx. 15,100 degree seeking students: 2,266 graduate and 12,834 undergraduate (Fall 2011)
More than 800 full and part time faculty    More than 600 full and part time support staff
403 acres located 25 miles west of Philadelphia
West Chester University has been a leader in this region for more than a decade in using Compressed Natural Gas (CNG) fueled vehicles as an environmentally friendly alternative to traditional gasoline cars and light trucks.
Station was moved from center of campus to present location on March 13th, 2008.
T. Boone Pickens talks energy at WCU

Listening to motor pool manager Larry Krackov, at right, at the Transportation Garage and Motor Pool in West Goshen on Friday are, from left, West Chester University facilities director Greg Cuprak, WCU President Greg Weisenstein, Congressman Patrick Meehan, investor T. Boone Pickens and Congressman Jim Gerlach.

Staff Photo by Larry McDevitt/Daily Local News
ANGI International Fast Fill Station
ANGI Int’l of Janesville, WI

Ingersoll-Rand Model 20H40NG Air Cooled 4 Stage Reciprocating Compressor
30 hp Electric Motor  Inlet Pressure 16 psi/Discharge Pressure 4,100 psi  Approx. 40 SCFM
ANGI Built Dispenser w/MicroMotion Mass Flow and Density Sensor
with Storage built in McKeesport, PA
FuelMaker Time Fill Unit

Available in 3000 and 3600 psi configuration
Available with one and two fill hoses
WCU staff modified unit to include an hour meter for monitoring use - approx. .9 gge/hour
WCU has 22 vehicles capable of running on CNG, reflecting 26% of its total fleet of 82 vehicles.
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6.0 Liter V8 BiFuel Gas/CNG
Available both 2 and 4 wd
With both Gasoline and CNG
tanks full, this truck traveled
more than
WCU Plows with CNG!!
The U.S. Environmental Protection Agency (EPA) estimates that light duty natural gas vehicles emit 60 to 90 percent fewer smog-producing pollutants and 30 to 40 percent fewer greenhouse-gas emissions.
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In some big cities, according to NaturalGas.org, emissions can actually be cleaner than the surrounding air.
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An average dedicated natural-gas vehicle emits about 70 percent less carbon monoxide and 87 percent less NOx (nitrogen oxides) than a gasoline-engine car.
Initial investment in infrastructure was costly, but long term savings for the University are being realized.
Historically, natural gas has consistently been 20 to 45 percent less costly than its gasoline gallon equivalent (gge). As an example, when gasoline was peaking at over $4.00/gallon during summer 2008, PECO Energy’s published rate on July 31st, 2008 for selling CNG retail at its facility in Coatesville, PA was $2.30/gge, a savings of more than $1.70/gallon.
West Chester University has also embraced BioDiesel B20 as a cleaner alternative to traditional Diesel fuel. WCU currently uses this fuel in five medium and heavy duty trucks and nearly a dozen pieces of grounds equipment.

WCU replaced traditional Diesel fuel with BioDiesel B20 in April, 2008.
WCU Fuel Consumption

WCU’s use of Gasoline and Diesel fuels has been offset by the increased use of cleaner burning CNG and BioDiesel B20!

<table>
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<th>2001</th>
<th>2008</th>
<th>Difference</th>
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<tbody>
<tr>
<td>Gasoline</td>
<td>37289</td>
<td>29381</td>
<td>-7908</td>
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<tr>
<td>Diesel/B20</td>
<td>5462</td>
<td>5032</td>
<td>-430</td>
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<tr>
<td>CNG</td>
<td>1737</td>
<td>10321</td>
<td>+8584</td>
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<tr>
<td>Total Pumped</td>
<td>44489</td>
<td>44734</td>
<td>+245</td>
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WCU used more than 10,000 Gasoline Gallon Equivalency of CNG in FY 2008.

From 2001 to 2006, WCU increased the number of vehicles using diesel type fuel, and decreased the amount of diesel type fuel being used.
Why Use Alternative Fuels?

- For Compliance with EPAct 92 and Clean Air legislation
- For Clean Air
- Reduce dependence on foreign oil
- For lower fuel costs

“….the last public land link to Penn’s Woods.”
Challenges of CNG

- Acceptance – Using CNG isn’t harder, it’s just *different*.
- Costs of Ownership
- Infrastructure – vehicle and refueling
- Parts Availability - Longevity
- Training and technical resources for technicians and station operators.
Challenges of CNG

- Learning curve for manufacturers
- Marketing
- Regulatory – Testing and inspection of cylinders, relief valves, compressor equipment, conversion installations.
- Liability
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