



Natural Gas and the Clean Fuel Corridor on Delmarva



U. S. Department of Energy

December 10, 2013

Agenda

- ▶ What is Delaware's Clean Cities Program?
- ▶ Who is Chesapeake Utilities Corporation?
- ▶ What are the general benefits of natural gas?
- ▶ What are our objectives?
- ▶ What are the next steps?
- ▶ Q & A



Delaware's Clean Cities Mission



Delaware's Clean Cities Mission is three-fold:

- Advance the deployment of alternatively fueled vehicles;
- Reduce emissions that come from the transportation sector; and
- Reduce vehicle miles traveled through policies and programs that encourage car and van pools, ride-share and public transportation.



Clean Cities



Clean Cities Mission

To advance the energy, economic, and environmental security of the U.S. by supporting local decisions to reduce petroleum use in transportation.

- Energy Policy Act of 1992 (EPAAct)
- Provides a framework for **businesses** and government agencies to work together
- Goal: Reduce U.S. **petroleum** use by 2.5 billion gallons per year



Clean Cities Stakeholders



Coalitions are made up of local and national stakeholders.

- 8,400 stakeholders nationwide
- 49% private-sector stakeholders
- 51% public-sector stakeholders

Delaware's Coalition is made up of local governments, car dealers, state Universities, and private industry.



Who is Chesapeake Utilities?

- Chesapeake Utilities Corporation is a diversified utility company engaged in natural gas distribution, transmission and marketing; electric distribution; propane distribution and wholesale marketing; advanced information services and other related businesses.
 - Chesapeake Utilities Corporation is locally headquartered on the Delmarva Peninsula and has significant natural gas transmission and distribution facilities on the Peninsula.

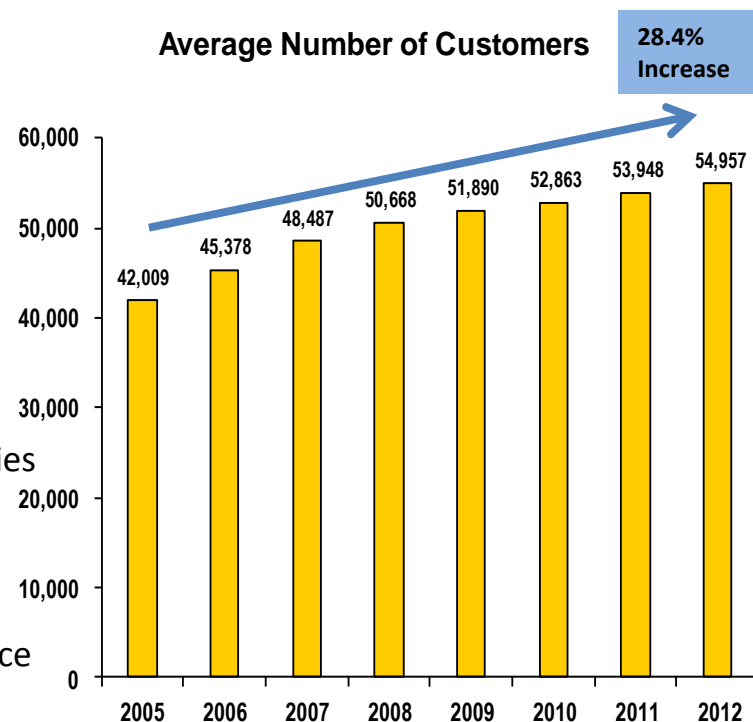


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Information about Chesapeake Utilities Corporation and the Chesapeake family of businesses is available at
<http://www.chpk.com> or
<http://www.chpkgas.com>

Chesapeake Utilities: Delaware & Maryland

- Approximately 55,000 customers **during 2012**
 - Residential - 90%
 - Commercial - 9%
 - Industrial - 1%
- Two divisions
 - Delaware
 - Customers in Sussex, Kent & New Castle Counties
 - Maryland
 - Customers in Wicomico, Dorchester & Caroline Counties
- Distribution
 - 1,162 miles of main in Maryland and Delaware.
- Service and rates regulated by the respective State Public Service Commissions in Maryland & Delaware
- In 2013 added a 3rd Division called Sandpiper which will provide service to 11,000 customers in Worcester County (Berlin and Ocean City)



Chesapeake's Delmarva Natural Gas Footprint*

Transmission



Distribution

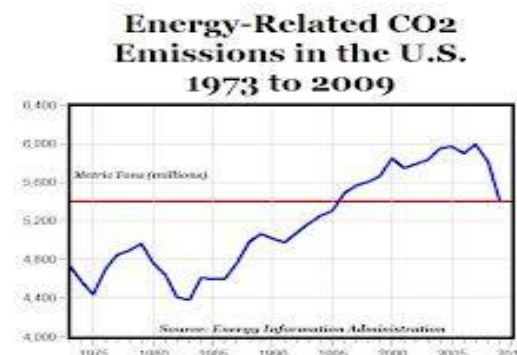


*Worcester County was added 2nd quarter of 2013

- Over the past three to four years, Chesapeake has converted several medium to large sized commercial and industrial customers and has lowered energy costs for the businesses as well as their carbon footprint.
- These conversions to natural gas have displaced several million gallons of fuel oil on Delmarva, enabled our customers to lower their carbon footprint, save millions of dollars and save and/or create jobs.

Fuel Source	Annual Gallons Displaced	Annual Energy Savings	Annual Avoided Tons CO ₂
No. 2 Fuel Oil	1,202,481	\$2 Million	2,907
No. 4 Fuel Oil	622,225	\$1 Million	1,707
No. 6 Fuel Oil	3,586,733	\$4 Million	11,434
Total	5,411,439	\$7 Million/Year	*16,048

*Equivalent to approximately 2,757 cars being taken off the road



Benefits of Natural Gas

Energy Smart

- Natural gas is dependable and reliable.
- Natural gas is safe.
- Natural gas is domestic. About 99% of NG consumed in the US is produced in North America – natural gas can help to reduce dependence on foreign fuel sources.

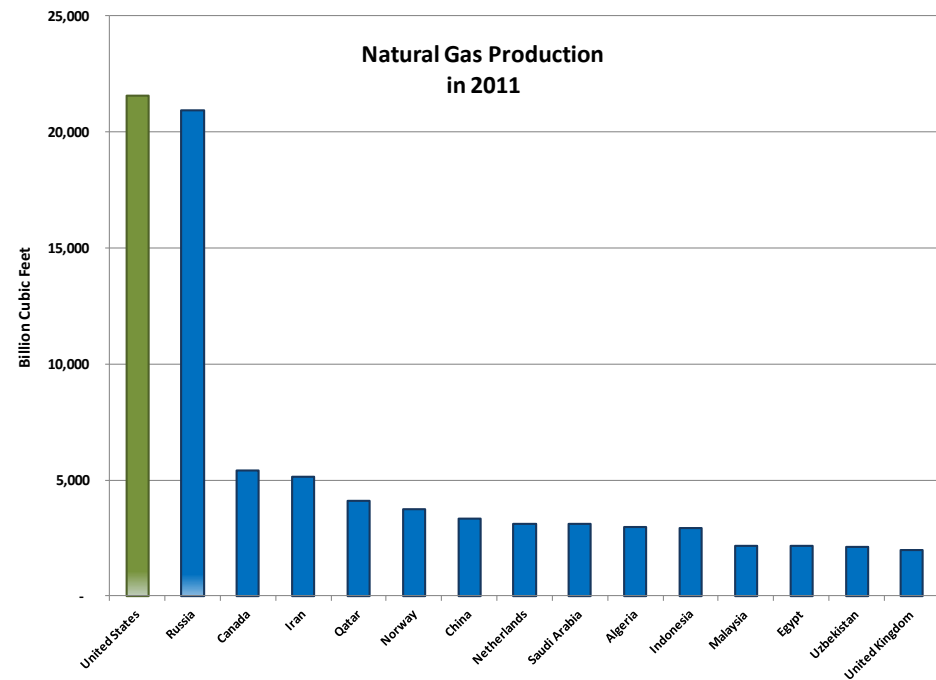
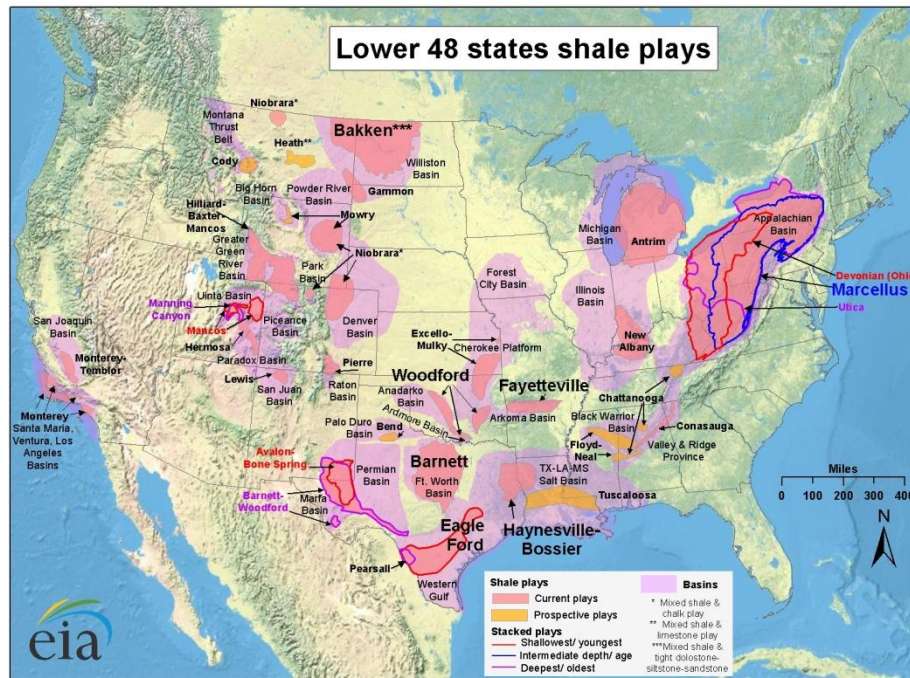
Environmentally Smart

- Natural gas is clean. It has lower emissions than any other fossil fuel.
- By displacing dirtier fuel sources such as coal and fuel oil, natural gas can help to lower the region's carbon footprint and help to address a number of environmental concerns.
- Natural gas is efficient. About 90% of the natural gas produced is delivered to customers as useful energy.

Economically Smart

- Natural gas is economical. Natural gas provides economic benefits to the areas in which it serves through jobs, investment and tax revenues.
- Price spreads between natural gas and oil are projected to continue, therefore the lower energy costs associated with natural gas usage can result in lower fuel costs to the consumer and enhanced viability for businesses and saving jobs.

Natural Gas is Domestic & Plentiful



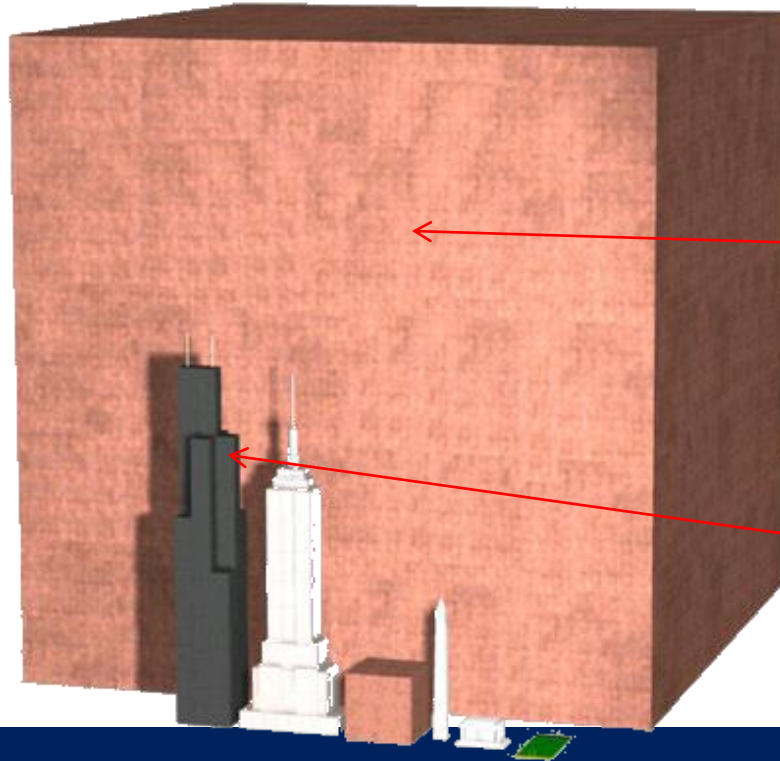
*“The United States has more natural gas
than Saudi Arabia has oil.”*

How Much Gas is Available in North America?

2 Quadrillion Cubic Feet

2,000,000,000,000,000 ft^3

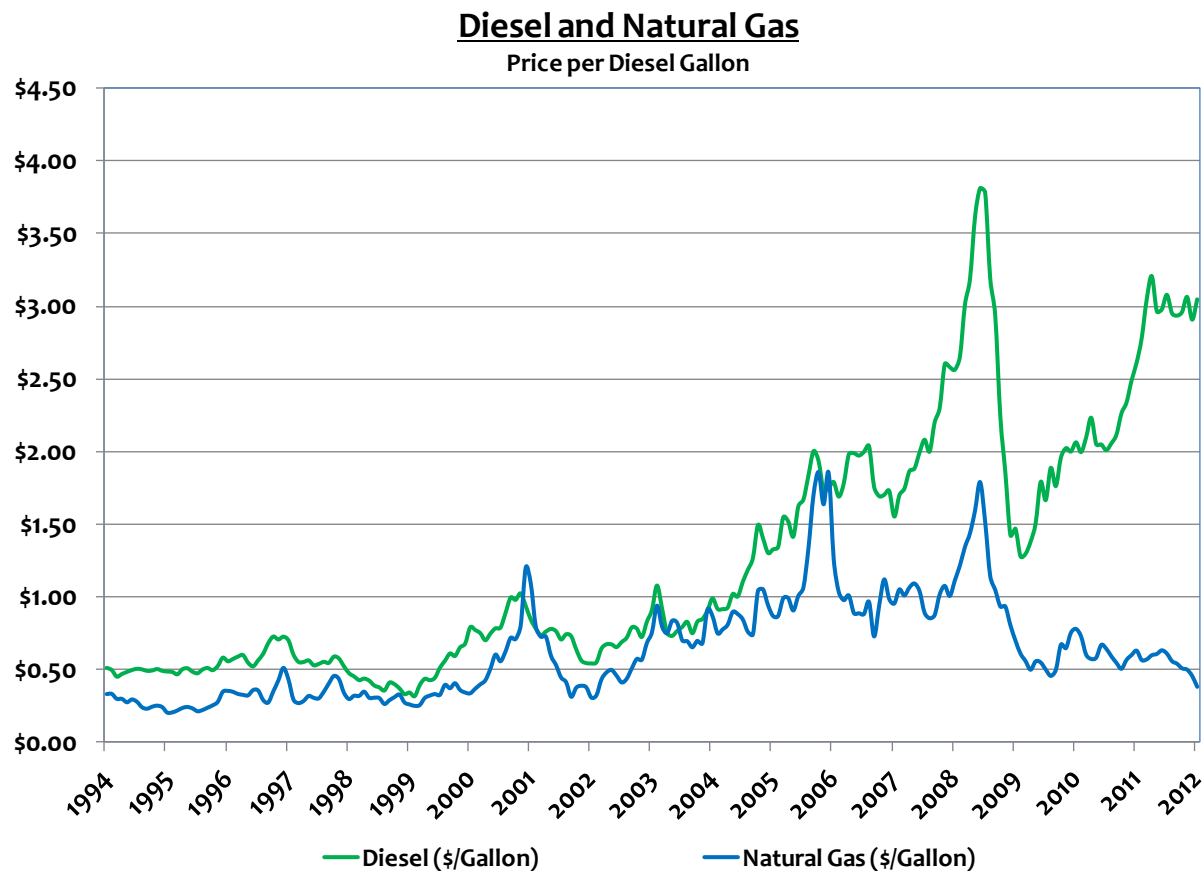
*That's
Two
Million
Billion!*



*Those are
pennies...*

*And **that** is
the Willis
(aka-Sears)
Tower!*

- PRICING HAS DECOUPLED FROM OIL AND STABLIZED



Stability – What a difference 7 years makes

2005			
TUES	23 – Aug	\$10.13	
WED	24 – Aug	\$10.65	
THURS	25 – Aug	\$10.52	
FRI	26 – Aug	\$10.18	
SAT	27 – Aug	\$10.29	
SUN	28 – Aug	\$10.29	
MON	29 – Aug	\$10.29	
TUES	30 - Aug	\$13.00	28.4%

2012			
THURS	23 – Aug	\$2.87	
FRI	24 – Aug	\$2.92	
SAT	25 – Aug	\$2.83	
SUN	26 – Aug	\$2.83	
MON	27 – Aug	\$2.83	
TUES	28 – Aug	\$2.91	
WED	29 – Aug	\$2.85	
THURS	30 - Aug	\$2.81	-2.1%

CNG is Safe

CNG fuel tanks are approved by the US Department of Transportation and are much safer than traditional fuel tanks.

CNG tanks are able to:

- Survive a drop from an 8-story building
- Resist the blast caused by a full stick of TNT
- Survive a 1500 degree fire
- Remain intact when shot by a bullet from a high-powered rifle



Natural gas is lighter than air. When released it dissipates into the atmosphere, quickly moving up and away from its source. Natural gas has an ignition temperature that is 2 times higher than that of motor gasoline and a narrow range of flammability. In concentrations below 5% and above 15%, natural gas cannot ignite.

In each of the test cases listed above, the pressure relief valve vented the contents of the tank safely into the atmosphere without combustion. This is specifically how the tank was designed to perform.

CNG is Clean

*"Natural gas emits 70% less carbon monoxide (CO) and
87% less nitrogen oxide (NOx) than unleaded gasoline"*

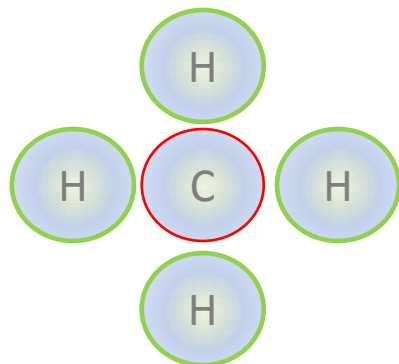


*This CNG
Hummer*

is cleaner than

this Smartcar

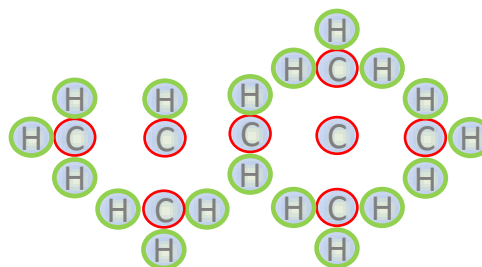
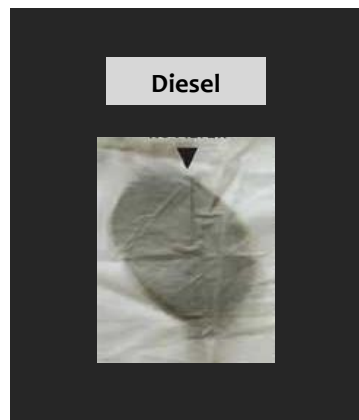
A Closer Look at Clean



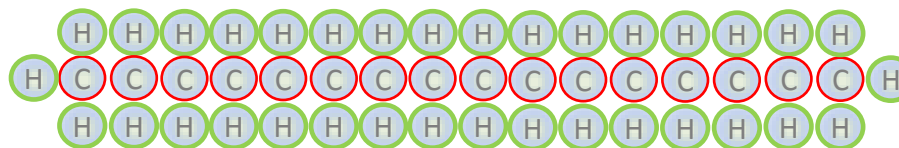
Natural Gas



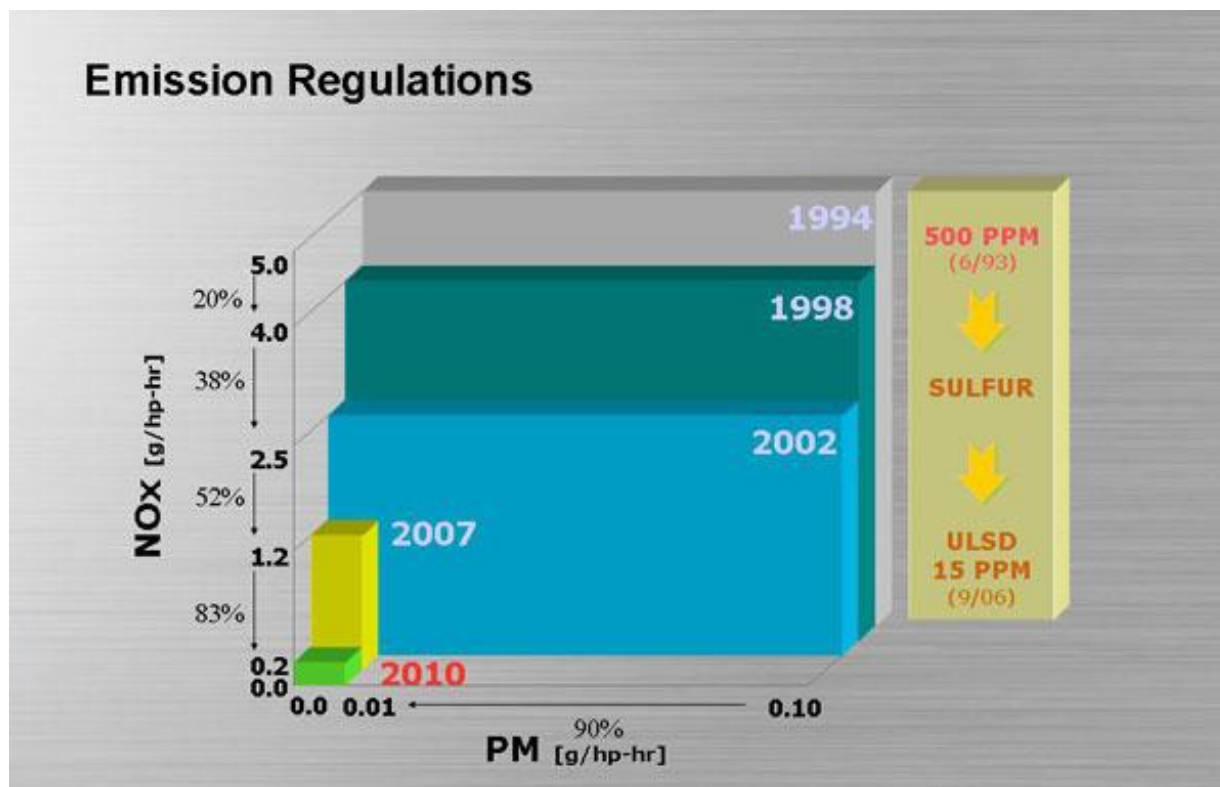
*Natural Gas
engines produce
over 80% less
emissions than the
cleanest diesel
engines.*



Unleaded Gasoline



Standards are Tightening



Natural Gas is proven – elsewhere



Locations	Approximate Number of CNG Vehicles
Pakistan	2,740,000
Iran	1,954,925
Argentina	1,901,116
Brazil	1,664,847
India	1,080,000
Italy	730,000
China	450,00
Columbia	340,000
Thailand	218,459
Bangladesh	193,521
Bolivia	140,400
Egypt	122,271
United States	112,000
Russia	100,000
Venezuela	43,000
Canada	12,000

Natural Gas is proven – Early 1900's



Natural Gas is proven – To Now



Comparison – 8.9L

Diesel Truck

240 diesel gallons

1,500 Mile range

18,700 lbs

CPM - \$.637



CNG Truck

115 DGE

500 mile range

19,000 lbs

CPM - .537



Cummins Westport 11.9L NG

- **NGV: Tractor – 11.9L ISX12-G**
- **Specifications**
 - **Engine:** 11.9L Cummins Westport ISX-G
 - **Horsepower:** 400 HP @ 1800 RPM
 - **Torque:** 1450 ft/lbs @ 1200 RPM
 - **Transmission:** Allison 4000 / Fuller 10 Speed Manual
 - **Fuel Tanks:** 40-190 DGE - CNG or LNG
 - **Range:** 160 – 750 miles per fill
 - **Bore and Stroke** 5.11 IN x 5.91 IN 130 MM x 150 MM
 - **Oil System Capacity** 12 U.S. GALLONS 45.4 LITERS
 - **System Voltage** 12 V
 - **Net Weight (Dry)** 2,650 LB 1,202 kG



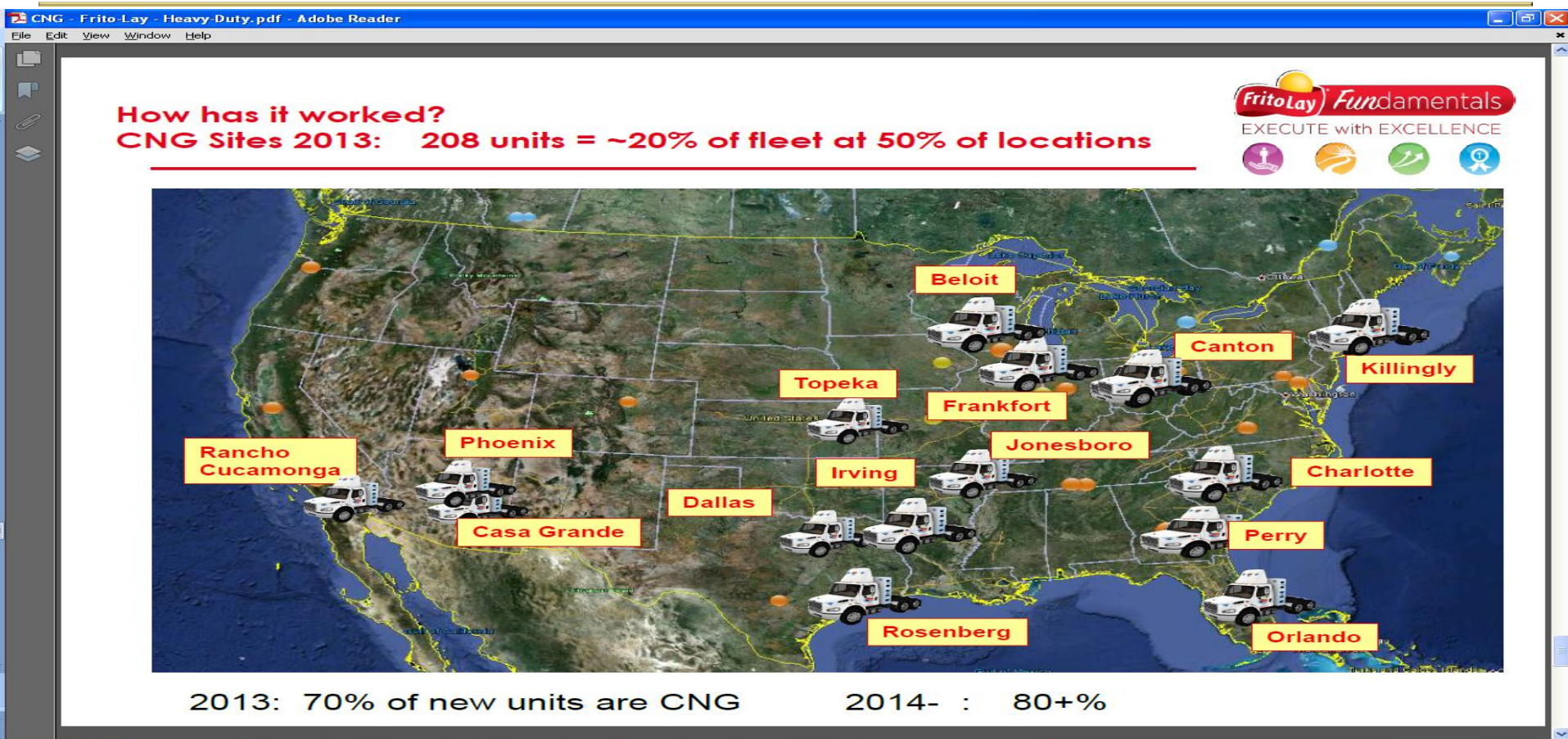
Example – Waste Management

- WM of Seattle
 - 106 CNG trucks implemented in early 2009
 - Displacing 1.2 million gallons of diesel annually
 - Reducing Nox up to 25%
 - Reducing PM by 94%
 - Reducing GHG's by 20%



WM – 80% of the Class 8 trucks purchased in 2012 will be powered by natural gas

Example Frito Lay



EV – close but not quite yet
Propane – close but not quite yet
CNG Class 8 – YES!

UPS – All Class 8 purchases will be NG going forward

Alternative Fuels - UPS - Heavy Duty.pdf - Adobe Reader


File Edit View Window Help

8 / 11 109%

Tools Sign Comment

U.S. Alternate Fuels and Technology

U.S. Alternative Fuel Vehicles Total: 1,424

<p>Electric Vehicles : 6</p> <ul style="list-style-type: none"> ▪ P70E = 4 Package Cars ▪ P100E = 2 Package Cars <p>Hydraulic Hybrid Vehicles (HHV): 5</p> <ul style="list-style-type: none"> ▪ P10HH = 5 Package Cars <p>Compressed Natural Gas (CNG) Vehicles: 933 (car group = count)</p> <ul style="list-style-type: none"> ▪ P70C = 189 Package Cars ▪ P80C = 49 Package Cars ▪ P100C = 608 Package Cars ▪ P10CX = 50 Package Cars ▪ HSC = 37 Shifters <p>Propane Vehicles : 7</p> <ul style="list-style-type: none"> ▪ HSP = 7 Shifters 	<p>Hybrid Electric Vehicles (HEV): 380</p> <ul style="list-style-type: none"> ▪ P70H = 25 Package Cars ▪ P100H = 355 Package Cars  <p>Liquid Natural Gas (LNG) Vehicles : 93</p> <ul style="list-style-type: none"> ▪ HTLG = 81 Tractors ▪ HTLGT = 12 Tandem Tractors
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8

P&G — (one way for — Hire contracts)

- Loads per year — 800,000
- Current Contract terms — 1 or 2 year
- Model — One way, for-Hire
- Results —
 - Awards to 8 carriers representing ~7% of network
 - Longer Term contracts? (not much)
 - Destinations in 16 states
 - Delivers Savings
 - Improves Sustainability
 - Implementation July-Dec 2013
 - Goal for 20% of network on NG by 2014





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WHAT IS CNG? VEHICLES STATIONS STATES

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STATIONS

Looking to fill up or just wondering where you would go if you had a CNG vehicle?

You just found the best map around.

19901 GO

FIND A STATION

PLAN A TRIP



Stations / Availability

- ☒ Public / Active
- ☐ Private / Active
- ☐ Public / Planned
- ☐ Private / Planned

site feedback



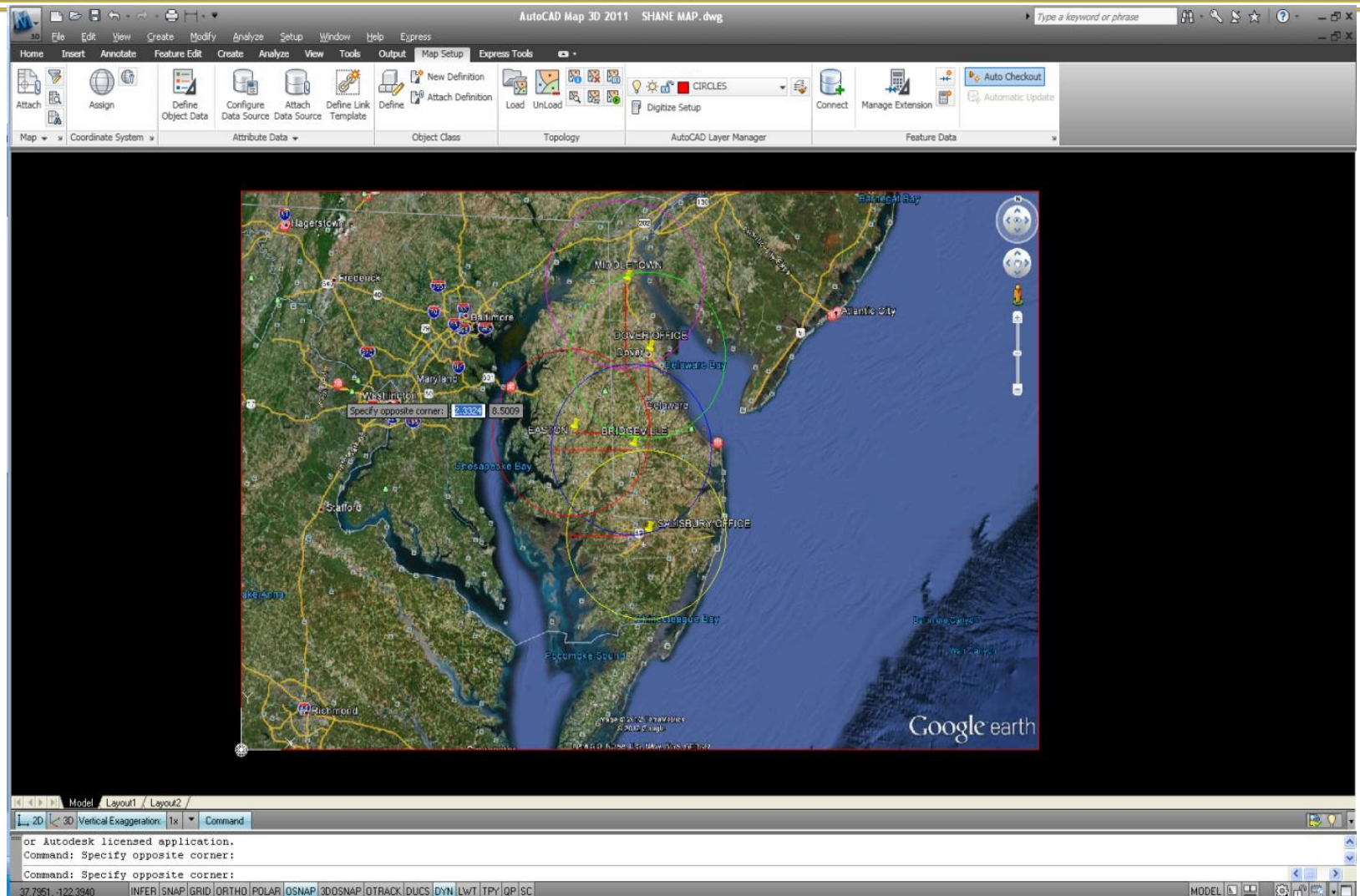
Support alternate fuels



What are our Objectives?

- ▶ Our objective is to help energy consumers by:
 - Increasing their energy options
 - Providing safe and reliable delivery of gas to customers
 - Helping the environmental impact (carbon footprint)
 - **Reducing dependence on foreign sources of energy**
 - Providing the most cost effective fuel choice
- ▶ Facilitating the development of a robust distribution infrastructure.
- ▶ Find out where fueling stations would most benefit YOU!

Let's create a Clean Fuel Corridor



Thank you !

We are here to help!

Questions?