

PIONEER

NATURAL RESOURCES

Natural Gas Powered Engines

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For updates on the NGV market in TX and beyond:

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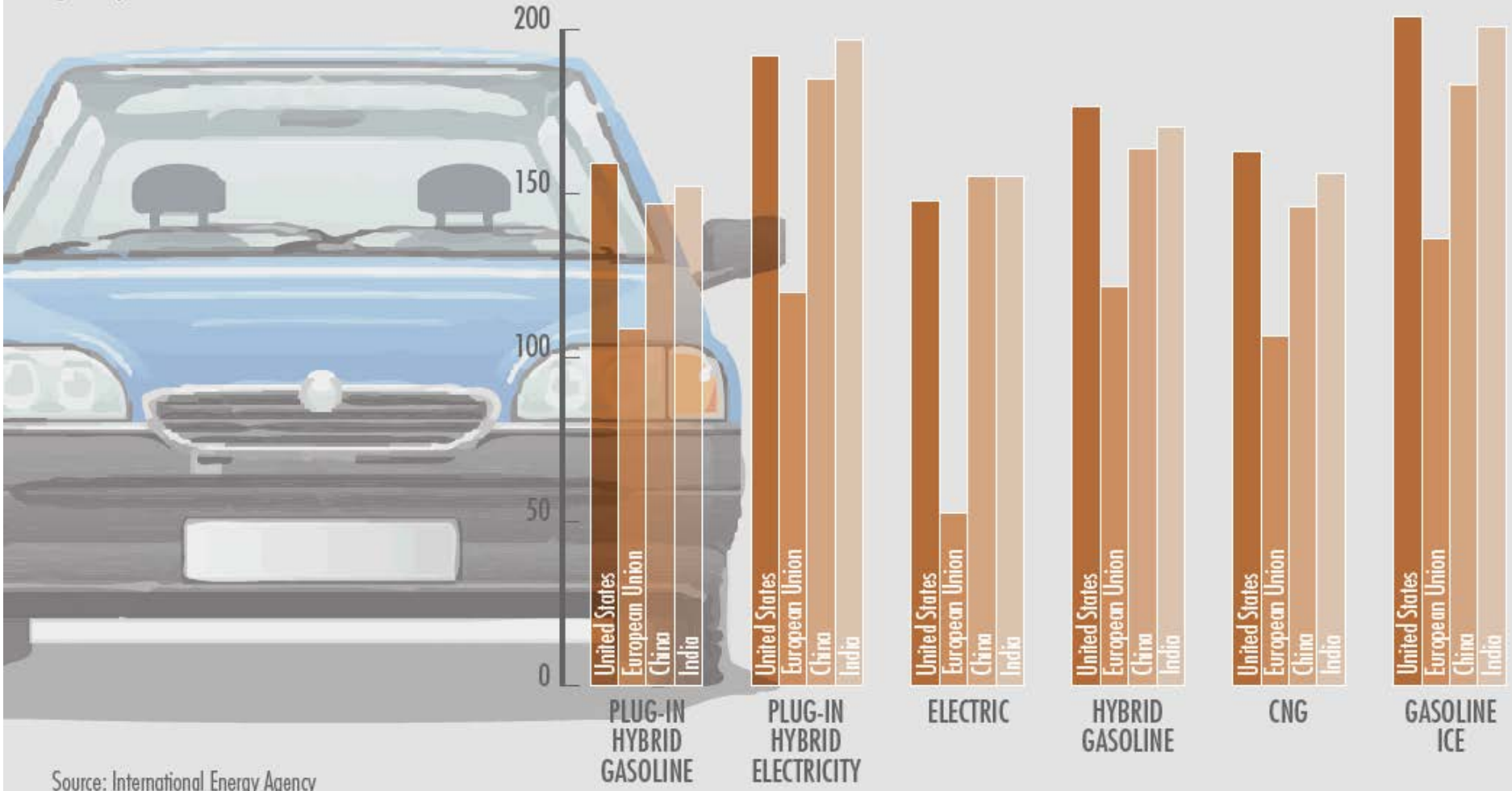
Twitter - @lynnmurraylyon

July 10, 2013

NYSE: PXD
www.pxd.com

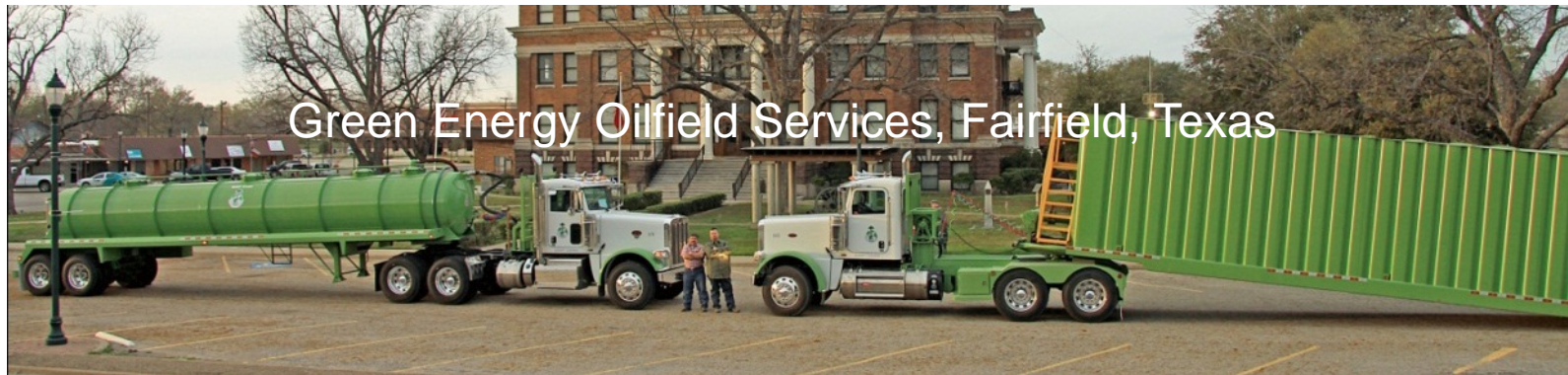


grams per kilometre



Source: International Energy Agency

- 98 % of the natural gas we use in this country comes from right here in North America
- Why import more than 10 million barrels of oil each day?
- Greater reliance on our own vast domestic supplies of clean natural gas can advance our national security
- Using natural gas for transportation can make a real difference



- CNG is a safer fuel than gasoline
- The MPG for NGV are equivalent to gasoline powered vehicles
- CNG fueling is equivalent to gasoline filling ~90 seconds
- CNG vehicles reduce Volatile Organic Compounds 10%, Carbon Monoxide 20- 40%, Particulate Matter 80%, Greenhouse Gases 21-26%
- CNG – octane level of 130, cleaner burning to optimize the fuel
- 1 MCF equals 7.5 Gallons of Gasoline ($2.81/7.5 = .38$ per GGE pre-tax and other)
- Light Duty Truck Conversion Costs = \$10K, Heavy Duty Conversion Costs = \$45K
- Station Costs CNG = \$500K (small) - \$1.5MM(large), LNG = \$1.5M(small) - \$2.5M(large)

Table 2. January 2011 Overall Average Fuel Prices on Energy-Equivalent Basis

	<i>Nationwide Average Price in Gasoline Gallon Equivalents</i>	<i>Nationwide Average Price in Diesel Gallon Equivalents</i>	<i>Nationwide Average Price in Dollars per Million Btu</i>
Gasoline	\$3.08 GGE	\$3.43 DGE	\$26.67 Btu
Diesel	\$3.09 GGE	\$3.45 DGE	\$26.81 Btu
CNG	\$1.93 GGE	\$2.15 DGE	\$16.74 Btu

CNG measured by Btu

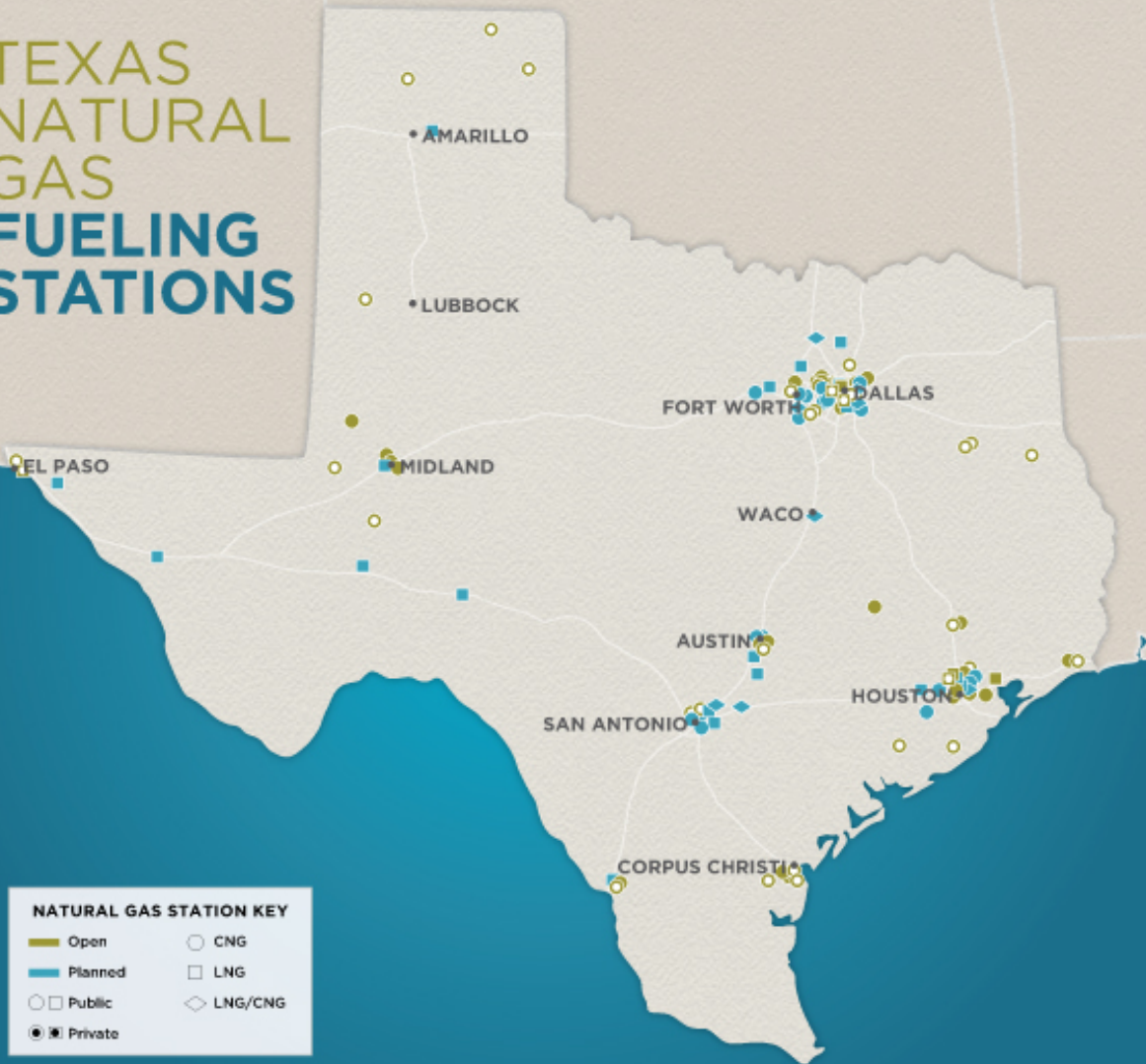
GGE = Gasoline Gallon Equivalent

DGE = Diesel Gallon Equivalent

- -260° F at normal pressure results in the condensation of the gas into liquid form
- Clear, colorless, odorless, non-corrosive, and non-toxic
- Removes oxygen, carbon dioxide, sulfur, and water from the natural gas, resulting in LNG that is almost pure methane
- Converted to liquid form for ease of storage or transport in cryogenic tanks
- Less than half the weight of water, so it will float if spilled on water
- 1/600th the volume of natural gas in the gaseous state
- Principally used for transporting natural gas to markets, where it is regasified and distributed as pipeline natural gas
- When the vapor mixes with air, it's only flammable when mixture is between 5-15% natural gas. When the mixture is less than 5% natural gas it doesn't burn. When the mixture is more than 15% natural gas in air, there is not enough oxygen for it to burn

- **Washington Metropolitan Transit Authority conducted a study of traditional transit buses v. natural gas buses and found:**
 - 53 percent lower emissions of NOx
 - 85 percent lower total particulate matter
 - 89 percent lower CO emissions
- **Dallas Fort Worth International airport's natural gas vehicles emission reductions :**
 - Carbon monoxide by 70-90 percent
 - NOx by 75-95 percent
 - CO₂ by 20-30 percent
- **Waste Management's equipment upgrades in Seattle WA:**
 - Reduced NOx by 97 percent
 - Particulate matter by 94 percent
 - GHG by 20 percent

TEXAS NATURAL GAS FUELING STATIONS



This information is based on publicly available information announcing plans to develop a new fueling station at the site indicated and is subject to change.

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Existing stations –

- 66 natural gas stations
- in >40 cities

Planned stations –

- >60 new stations
- open in 6-18 months

Fleet users–

- UPS
- FedEx
- Central Freight
- Sysco
- Waste Management
- Pepsi-FritoLay
- Ryder
- Atmos
- Pioneer

•in >100 cities



- Westport Wing Bi-fuel F250 Fords with 24.5 GGE tanks with 325 Mile Range on CNG, additional 450 on gasoline for 775 total Range
- Peterbilt Dedicated CNG Trucks with 1,000 Mile Range

NYMEX Spot \$1.89/MM Btu

NYMEX Spot \$5.00/MM Btu

INPUT	COST
Natural Gas (divide by 8.0)	\$0.24
Transport Costs & Fees	\$0.25
Electricity Costs per GGE	\$0.15
Maintenance per GGE	\$0.26
Federal and State Taxes	\$0.25
Fuel Card Fees per GGE	\$0.05
Retailer Profit Margin	\$0.65
CNG at the pump	\$1.85

INPUT	COST
Natural Gas (divide by 8.0)	\$0.62
Transport Costs & Fees	\$0.25
Electricity Costs per GGE	\$0.15
Maintenance per GGE	\$0.26
Federal and State Taxes	\$0.65
Fuel Card Fees per GGE	\$0.05
Retailer Profit Margin	\$0.65
CNG at the pump	\$2.63

If the spot price for natural gas increases 2.5X, it has a minimal impact on the price at the pump. If the price of oil increases 2.5X...