

# Natural Gas Vehicle Workshop and Luncheon

Jeff Wittenberger  
Business Development Manager

May 15, 2014



# Why Natural Gas?

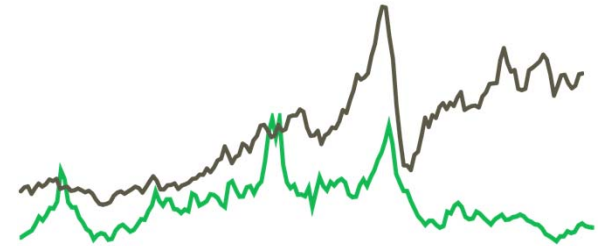
ECONOMIC  
IMPACT



SUSTAINABILITY  
GOALS



FUEL  
STABILITY



# Shippers Look to Natural Gas



**Steve Banker**, Contributor

I cover logistics and supply chain management.

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LOGISTICS & TRANSPORTATION | 11/07/2013 @ 11:59AM | 4,843 views

## Procter & Gamble, General Mills And Frito-Lay Transition To Natural Gas Fleets

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Nancy Getter, the Associate Director of Global Logistics at [Procter & Gamble](#) (P&G); Doug Watne, Director of North American Transportation at [General Mills](#), Erik Neandross, a [clean energy consultant](#) for [Frito-Lay](#), and Dave Oren, the President of [Dart Transit Company](#), all spoke on a panel at [CSCMP](#) a few weeks ago about using natural gas trucks for a larger portion of their shipments.

P&G has 800,000 annual shipments over 8,000 lanes in North

43

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### Lowe's Launches Natural Gas-Powered Truck Fleet At Texas RDC

October 17th, 2013

*Lowe's working with carriers to transition all regional distribution center dedicated fleets to natural gas by end of 2017*

MOORESVILLE, N.C., Oct. 17, 2013 /PRNewswire/ – As part of its continued commitment to [promote responsible transportation practices and sustainable technologies](#), Lowe's today announced it has launched a dedicated fleet of natural gas-powered trucks at its regional distribution center in Mount Vernon, Texas. Lowe's dedicated fleet at Mount Vernon is among the first serving a major retail distribution center in North America to run solely on natural gas.

With the transition from a diesel-fueled fleet to trucks powered by liquefied natural gas (LNG), Lowe's expects to reduce greenhouse gas emissions nearly 20 percent and control fuel costs as it transports up to 68 truckloads each day to stores in Texas, Louisiana and Oklahoma.



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# Fleets Deploy Natural Gas

ENERGY MANAGEMENT

## SUPERVALU Unveils New Natural Gas-Powered Truck Fleet

December 9, 2013 No Comments

KEYWORDS compressed natural gas / distribution center / energy efficiency / fleet / fuel efficient / greenhouse gas emissions / SUPERVALU

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## FedEx Freight Debuts New LNG Tractors in Dallas



November 01 2012

MEMPHIS, Tenn., Nov. 1, 2012 – FedEx Freight, a leading U.S. provider of less-than-truckload (LTL) freight service and a subsidiary of FedEx Corp. (NYSE: FDX), has begun beta testing two new tractors powered by liquefied natural gas (LNG)-only engines. The pre-production engine used in the new tractors is slated for limited release in 2013 and is currently the only all natural gas engine that begins to meet the size and power needs of Class 8 trucks.

"FedEx Freight has a long-standing commitment to minimizing environmental impact, and natural gas—a cleaner burning fuel than diesel—has the potential to translate into lower greenhouse gas emissions," stated John Smith, vice president, Safety, Fleet Maintenance and Facility Services for FedEx Freight. "We are proud to be the first fleet to receive these new tractors fitted with natural gas-only engines that are powerful enough to meet our long-haul needs."

## Ryder to Lease 31 CNG Trucks to Saddle Creek

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Ryder System said it will lease 31 natural-gas vehicles to Saddle Creek Logistics Services for use in two markets, including Ryder's first natural-gas maintenance operation in Texas.

Ryder said Oct. 24 that 30 of the compressed natural gas vehicles will run in the Dallas area and be maintained at Ryder's Fort Worth service facility, which is being upgraded to meet natural-gas maintenance requirements.

One vehicle will operate in Saddle Creek's Shreveport, La., fleet and be maintained at Ryder's existing natural-gas vehicle n there.

Saddle Creek will take delive

cs provider s 430-truck 'der said. TI eightliner C:

ics



## UPS Plans for 900-Plus LNG Trucks

January 27, 2014 in LNG, NGVs by Rich Piellisch | No Comments

### Several Suppliers and Transporters Are Supporting Brown, Jacksonville, Chicago, Indianapolis Getting the Most Trucks



LNG-fueled Kenworth T800 in UPS brown.

UPS plans to have deployed between 900 and 1,000 liquefied natural gas-fueled tractors at more than a dozen locations by August, with Jacksonville, CACH (the firm's Chicago Area Consolidated Hub) and Tennessee each getting more than 100, according to a company deployment plan. Texas will have 80 LNG trucks, mostly in Houston, by the end of this first quarter.

Several fuel suppliers and at least one LNG transport specialist are now talking up their roles.

### So Far It's Kenworth and Mack

As of October, UPS had deployed 114 LNG trucks (as well as 895 compressed natural gas vehicles), VP Scott Lavery said at the World LNG conference in Houston last week.

"The current order is with Kenworth and Mack," Lavery says of the 2014 plans. Other suppliers may yet participate, but "At this point it's a Kenworth and Mack show," he told F&F.

Also in October, UPS expanded on a major LNG commitment disclosed earlier at ACT Expo 2013 in Washington, D.C., outlining plans for an investment of some \$50 million to build nine more LNG fueling stations for a total of 13, all to be operational by the end of 2014, supporting the operation of approximately 1,000 trucks (F&F, October 14).

# Fleets Exploring Natural Gas Fueling



**FREIGHTLINER**

9  
LITER

12  
LITER



9  
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12  
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**VOLVO**

13  
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**KENWORTH**

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LITER

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**NAVISTAR**

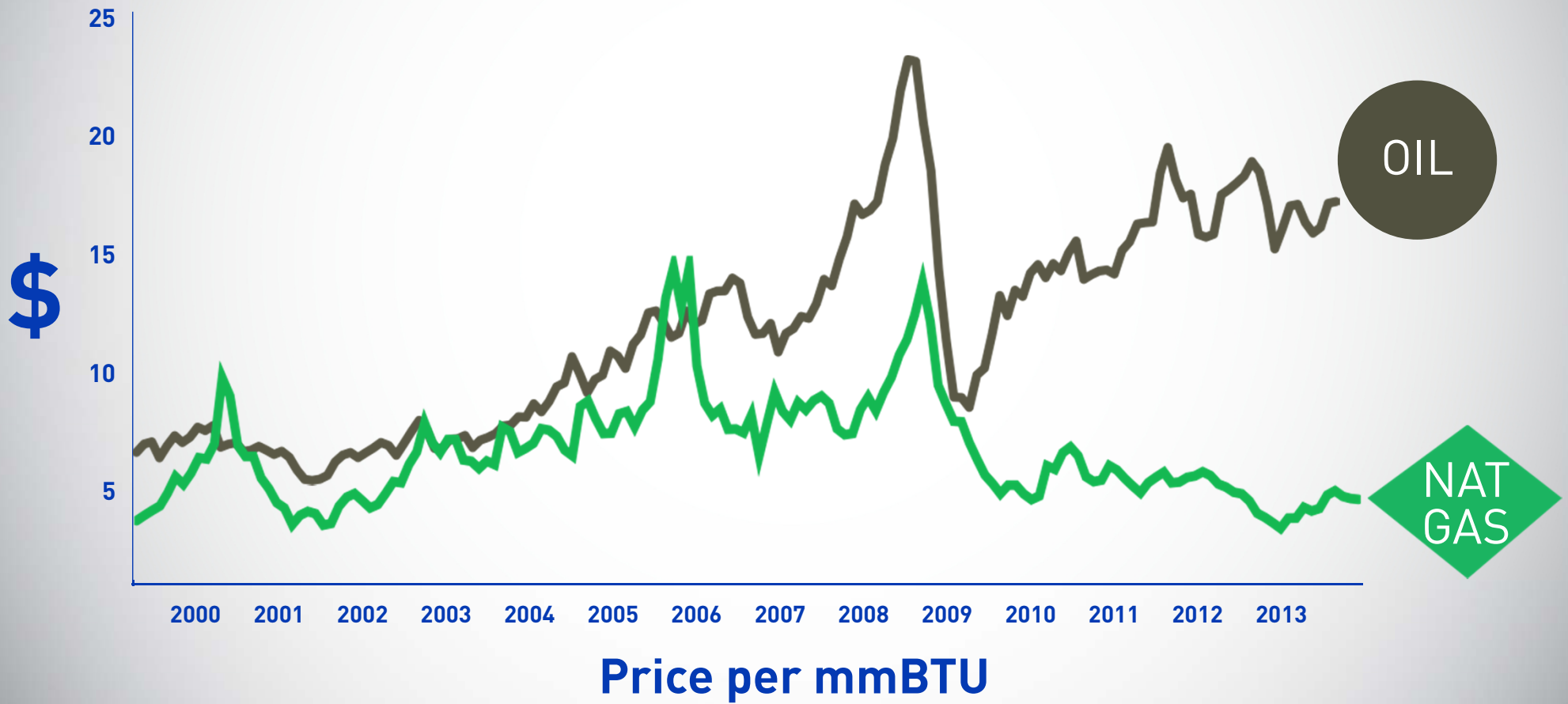


9  
LITER



Every Major Truck Manufacturer  
Offers Natural Gas Trucks

# Cost Of Oil Vs. Natural Gas



## ANNUAL MILES

75,000

100,000

125,000



\$2.75



\$4.00



## ANNUAL FUEL SAVINGS

\$15,625+

\$20,800+

\$26,000+



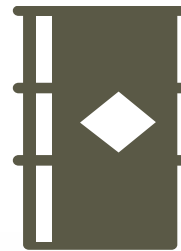
# Economics

## Simple Payback

Truck Cost



Annual Fuel



+\$20,800

Payback

< 2 years

# More Than Just Fuel When Evaluating a Transition to Natural Gas



FUELING  
SERVICES



ENGINEERING  
& CONSTRUCTION



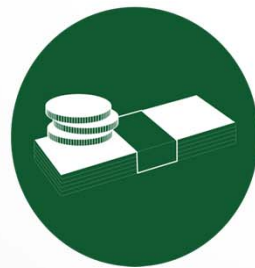
COMPRESSORS  
& EQUIPMENT



RENEWABLE FUELS



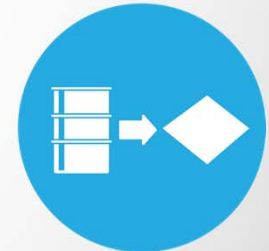
SERVICE  
& SUPPORT



GRANTS  
& FINANCING



LNG TECHNOLOGY  
& CONSTRUCTION



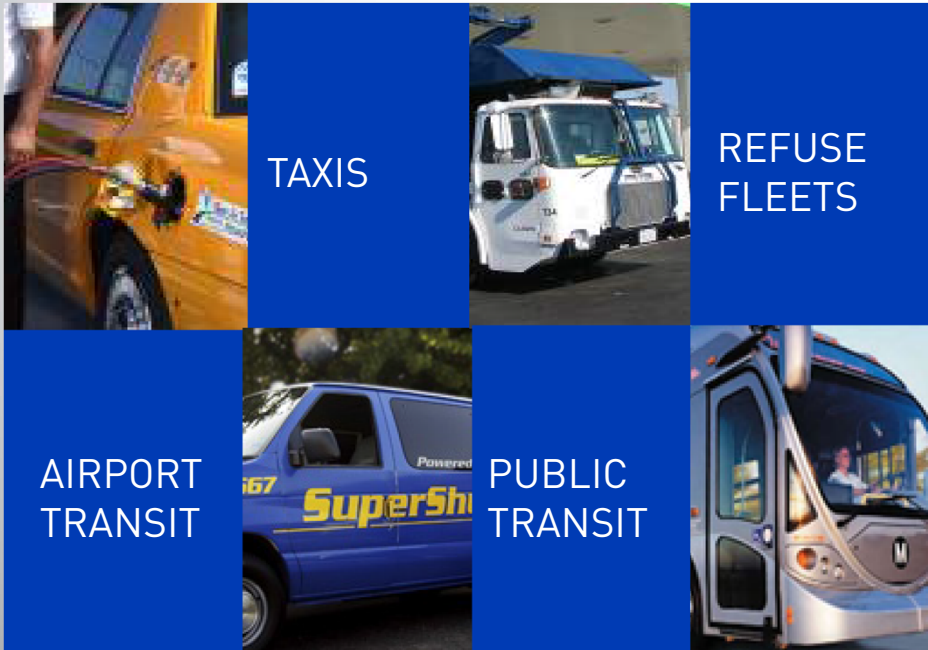
FACILITIES  
MODIFICATION

# The Leader in Both **CNG** and **LNG**

CNG

CNG

LNG



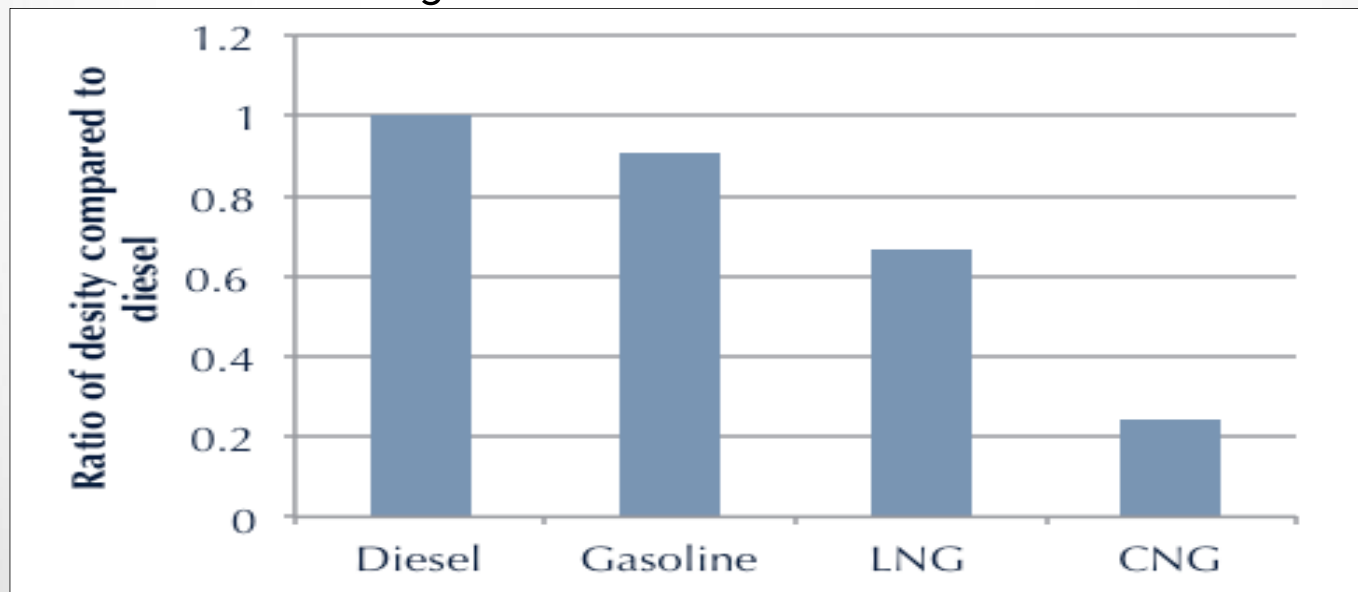
## CNG/LNG—The Distinction

- CNG and LNG are simply two different ways natural gas is stored
- There is no such thing as an “LNG engine” or a “CNG engine”
  - It’s not engine type that differentiates LNG and CNG, it’s how the fuel is stored and supplied to the engine
  - Both are delivered to the engine as a gas



## Energy Density

- Both CNG and LNG are less dense forms of energy than petroleum-based liquid fuel
  - NGVs need to have larger fuel tanks to store the same amount of energy



Source: US Energy Information Administration

# Compressed Natural Gas

CNG  
(≈120 usable gallons)

Diesel

Fuel State	Gas	Liquid
After Treatments	N/A	Yes
Dispensing Speed	5-10 GPM	20 GPM
Weight Impact	+1,500 lbs	N/A
Fuel Cost	\$2.50	\$4.00
Truck Investment	+\$60K	N/A





# Liquefied Natural Gas

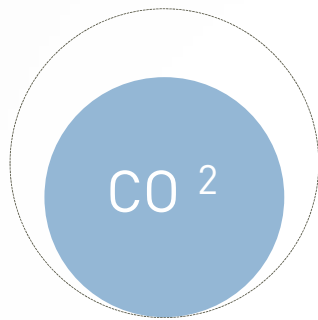
	LNG (≈120 usable gallons)	Diesel
Fuel State	Liquid	Liquid
After Treatments	N/A	Yes
Dispensing Speed	20 GPM	20 GPM
Weight Impact	+300 lbs	N/A
Fuel Cost	\$2.75	\$4.00
Truck Investment	+\$40K	N/A

# SUSTAINABILITY GOALS

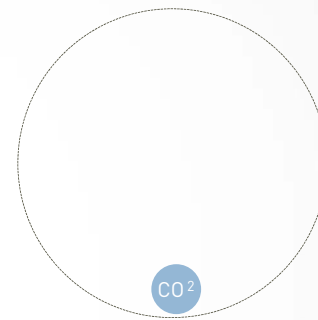




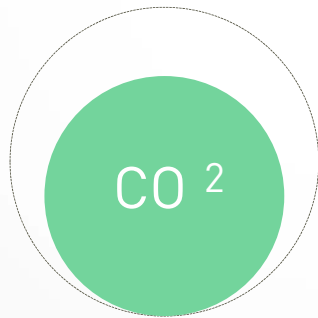
# NatGas Vehicles Have A Lower Carbon Footprint



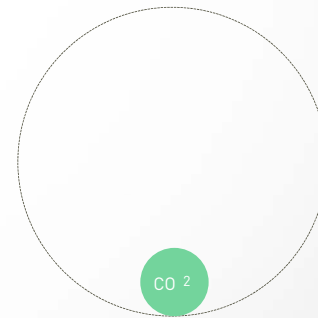
**CNG**  
**28%**  
**LOWER**



**CNG**  
**LANDFILL GAS**  
**88%**  
**LOWER**



**LNG**  
**23%**  
**LOWER**



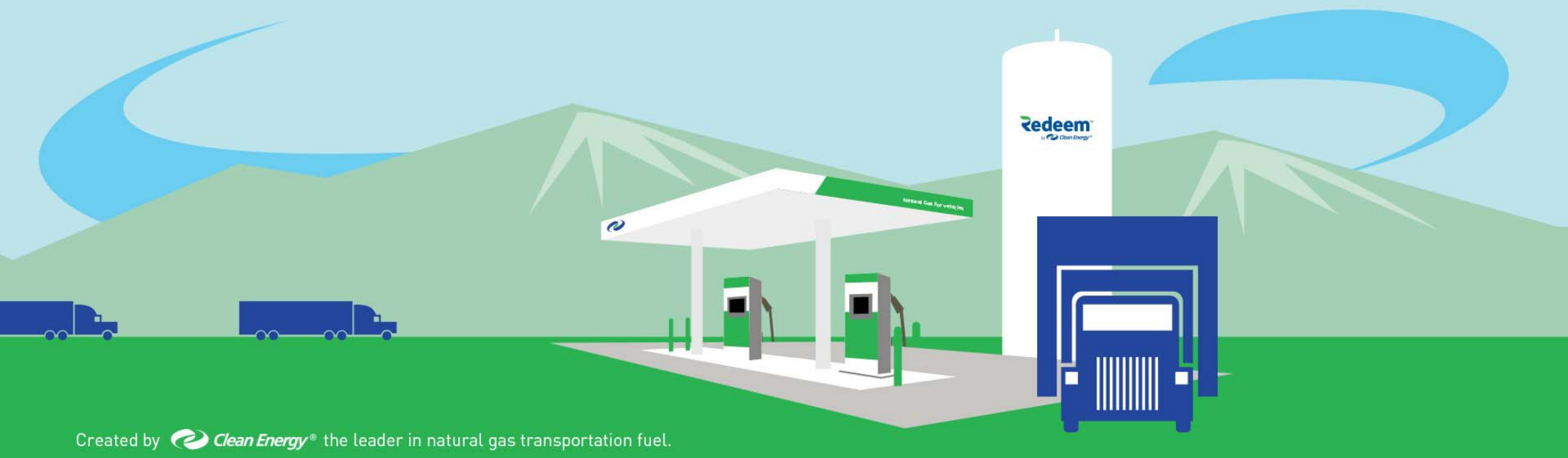
**LNG**  
**LANDFILL GAS**  
**84%**  
**LOWER**

**GREENHOUSE GAS EMISSIONS**

# THE WORLD'S CLEANEST FUEL FOR FLEETS

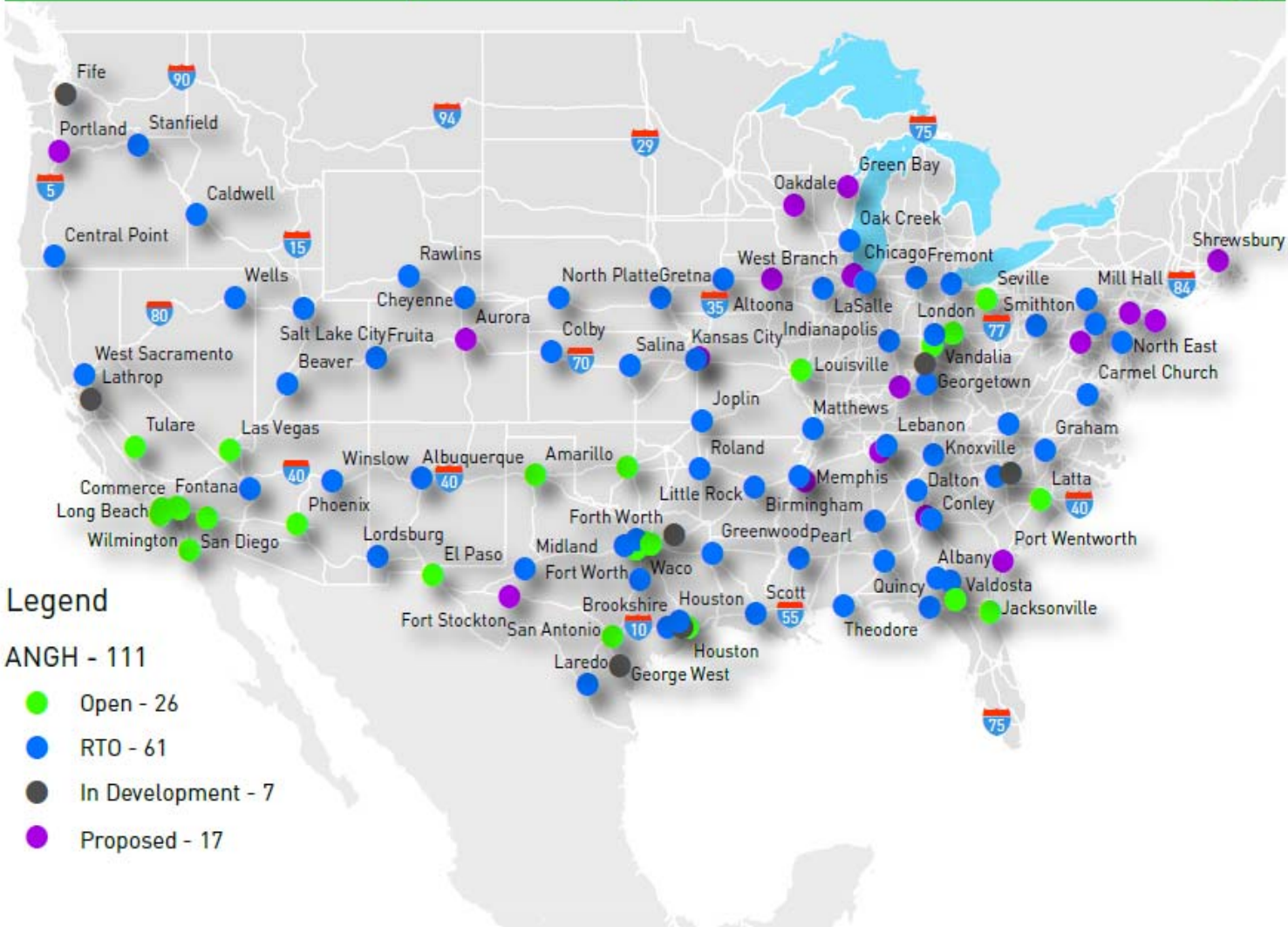
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# ANGH Station Development - May 2014



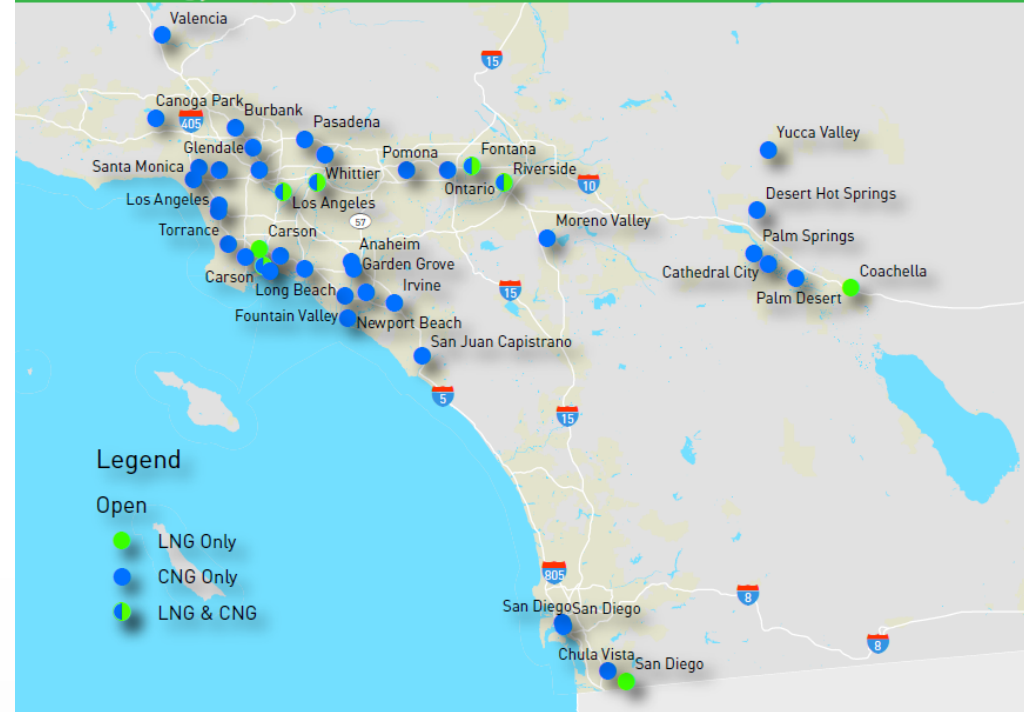
# America's Natural Gas Highway

## California

Clean Energy Stations - Central & Northern California



Clean Energy Stations - Southern California



# America's Natural Gas Highway

4305 West Capitol Avenue, West Sacramento, CA





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**Jeff Wittenberger**

*Business Development Manager*

*(206) 462-8168*

[jeff.wittenberger@cleanenergyfuels.com](mailto:jeff.wittenberger@cleanenergyfuels.com)