

# Natural Gas for Transportation: The Secret Is Out

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## Why Natural Gas for Transportation?



## • Cheaper

 Costs average between \$0.50- \$1.00 less per gallon than gasoline

#### • Cleaner

- Cleanest burning fuel available
- Reduces GHG emissions by up to 30% and NOx emissions by 85%

#### • Domestic

- 97% domestically produced
- Gallon per gallon displacement of foreign oil
- 150 year supply



## **Clean Energy**



#### Largest provider of vehicular natural gas (CNG & LNG) in North America

- 75 million gallons sold during 2008
- Full service
  - Design, Build & Operate Stations
  - Fuel and Fleet Marketing
  - Vehicle Grants (Awarded over \$115 Million)
  - Financing
- Operating Territory
  - 176 stations
  - 15 U.S. States
  - 19 Airports

## • Publicly-traded as CLNE on NASDAQ

- Fuel 14,000+ customer vehicles daily
- Headquartered in Seal Beach, CA



## **Clean Energy Stations**





City of College Park, Atlanta Hartsfield Airport



Los Angeles International Airport



Phoenix Sky Harbor (Eastside Station)



#### **Dallas Fort Worth**

## **Compressed Natural Gas (CNG) Basics**

- Used in cooking and heating
- Drawn from pipeline and compressed
- Dispensed similar to gasoline
- Stored in cylinders onboard vehicle









#### **Typical Compressor Compounds**







#### Gas Dryer



## Fast Fill Dispenser & Time Fill Posts





Fast Fill Dispenser



Time Fill Hoses

## Natural Gas for Transportation: America's Best Kept Secret







# >85% 0-25% 10-15% 2-6% Nox Treatment Diesel Emulsions Ethanol Blends Oxidations Low Sulfer Diese Bodiesel (B20)



#### Greenhouse Gases

#### CEC's Well to Wheels Study

- 23% GHG reduction compared to diesel fuel
- 30% GHG reduction compared to gasoline fuel



Source: South Coast Air Quality Management District 2007 Air Quality Management Plan Summit Panel

#### Fuel Price History: Lets Not Forget!!





Natural gas has been 25 - 61% cheaper than Diesel over last 10 years

## **Federal Tax Credits**



#### President's Energy Bill Tax Credits Effective January 1, 2006

Will cover a certain amount (up to 80%) of the incremental cost for each dedicated natural gas vehicle based on vehicle's GVWR (Gross Vehicle Weight Rating)

- GVWR < 8,500 lbs= \$13,800 (\$4,000)
  - Honda Civic, Ford Crown Victoria, Chevy Astro, GM SUVs
- GVWR 8,500-14,000 lbs= \$16,000 (\$8,000)
  - Ford F-150, 250, 350 Sierra/Silverado pickup, Express/E350 van
- GVWR 14,000-26,000 lbs= \$18,000 (\$20,000)
  - Ford E450 or GM 8.1L shuttle bus
- GVWR > 26,000 lbs= \$40,000 (\$32,000)
  - Dump Truck, Refuse Truck, Transit Bus, Street Sweeper

## Large, Secure, Domestically Available Supply of NG





\*Based on Current Rate of Consumption Sources: EIA 2006, Clean Energy

## **Niche Markets**



#### Airports

- We are at 19 majors
- Emissions mitigations with expansion

#### Goods Movement

- Port of LA/LB
  - 5,000-10,000 LNG Trucks
- Model for other ports

#### Refuse

- 200,000 truck opportunity
- 2.2 billion GGEs annually

#### Transit

- 20% penetration
- High fuel use

## International Expansion

- Accelerating growth
- Peru

#### 14

## **Niche Markets: Airports**

- A "hub" for ground transportation
  - Taxis, Limos, Door-to-Door Shuttles, Courtesy Shuttles
- CE operates at 19 of the US' largest airports including:
  - Atlanta Hartsfield, Dallas-Ft Worth, Denver, LAX, New York La Guardia, Phoenix, San Francisco, and Seattle
- Many airports around the US have implemented policies supporting the use









## Natural Gas Taxi Programs



#### At Airports

#### Ontario Airport

- 100% Alternative Fuel Required
- Two year Implementation, entire fleet by December 31, 2009
- Phoenix Sky Harbor Airport
  - 100% CNG Airport Taxi Fleet
  - 180 Taxis in service
- Seattle Tacoma Airport
  - 100% CNG Fleet
  - 200+ Taxis in service

#### In Cities

- San Francisco
  - GHG emission reduction mandate
  - Requires all cab companies to reduce their average GHG emissions by 20% from 1990 levels by 2012
- Manhattan Beach, CA
  - Small beach city served by 250 taxis
  - Required phase in of high efficiency or natural gas taxis



Santa Ana/John Wayne Airport



## Niche Markets: Refuse and Recycling



- Currently, over 2,500 refuse trucks run on natural gas in the US
  - Autocar announced a 60% increase in natural gas truck sales vs. past year
  - Natural gas refuse trucks are cleaner and quieter
- CE fuels over 1000 refuse trucks daily including:
  - Burrtec Industries; Fresno, CA; Smithtown, NY; and Waste Management
- More municipalities across the US are selecting natural gas trucks for residential collection services including:
  - Boise, ID; Brookhaven, NY; Hamilton, NJ; New York City; San Antonio, TX; Seattle, WA; College Park, GA



## How Municipalities Realize the NG Advantage



- Long Island Model
  - Refuse and recycling collected by third-party contractors
  - Municipality requires 100% CNG trucks in bid
  - Contracts with fuel provider to provide station and fuel for contractors
- Alternative Fuel Preference
  - Municipality requires that collection contractors provide service with 100% or fixed percent of alternative fuel vehicles- CNG, LNG, B100, etc.
  - Recently in Seattle, WA; Boise, ID; and Hamilton, NJ
- Government-Owned Fleets
  - Upon vehicle turnover, transition to CNG trucks
  - Contract with fuel provider to provide station and fuel
  - Some looking for unique vehicle financing

## Niche Markets: Transit

Clean Energy<sup>\*</sup>

- 30% of all new transit buses in the US are natural gas
  - Low cost operation, clean, and quiet
- CE provides daily fueling services for over 3,200 transit buses including:
  - Boston MBTA, Dallas ART, Foothill Transit, MTA Long Island Bus, San Diego Transit, and Valley Metro (Phoenix, AZ)
- OEM built by El Dorado, NABI, New Flyer, Orion



## Niche Markets: Goods Movement and Regional Trucking



# **Initial focus on Seaports**

- Seaports are essential for a strong economy and trade, but:
  - They are major sources of pollution
  - They are major sources of truck traffic
- The Ports of Los Angeles and Long Beach instituted landmark policies to reduce emissions
  - Replacing 5,300 drayage trucks with natural gas trucks
  - CE building 3 LNG stations
- Capacity, Kenworth, Ottawa, Peterbilt and Freightliner are producing OEM natural gas trucks for goods movement operations



## NG for Regional Trucking and Local Delivery



- Experience with Port of LA model will translate to other regional, return-tobase goods movement fleet operations
- Local delivery trucks have been operating on CNG for decades
  - UPS- Largest commercial NGV fleet in US; 1,400 units (150 in Atlanta, GA)
  - Beer distributors
  - AT&T just announced 8,000 NG service vehicles over next 10 years
- Product availability and engine development will be key to success
  - Both CNG and LNG applications are viable



## **Additional Key Niche Markets**



- School Districts
- Government and Private Fleets



## Conclusions



#### PAST

- Natural gas is cleaner, cheaper than diesel, and domestically-sourced
- More natural gas vehicles hit the street every year
  - Proven technology
  - Excellent operability, fuel cost savings, better lifecycle cost than diesel
  - Good public policy
- Examples/Models exist to aid your transition to natural gas



FUTURE







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