Advancing Your Fleet Goals with Natural Gas
NTEA Work Truck Show
3.07.19
NGVAmerica is the national organization dedicated to the development of a growing, profitable, and sustainable marketplace for vehicles powered by natural gas and biomethane and for promoting the use of more natural gas in transportation.

NGVAmerica represents 200+ companies, LDCs, fleets, OEMS, environmental and government organizations.
The Problem

Urban Emissions & Public Health
Urban Emissions: Public Health Impacts

Breathing in particle pollution increases the risk of:
- Asthma
- Lung Cancer
- Heart Disease
- Premature Death

134 million Americans live in areas with air that is unhealthy to breathe...

4 out of every 10 Americans

Source: American Lung Association, 2018
25 million Americans suffer from asthma... about 8% of our total population (1 in 12 people)

Every day in the United States, due to asthma:

• 30,000 people have an asthma attack
• 5,000 people visit the emergency room
• 11 people die.

Source: Centers for Disease Control and Prevention
African Americans Disproportionately Affected

71% of African Americans live in counties in violation of federal air pollution standards. Black children are 2x likely to be hospitalized for asthma and 4x likely to die from it than white children.

From 2001-2009, the greatest rise in asthma rates was among black children – a 50% increase.

1 in 6 black children had asthma in 2009.

Source: Centers for Disease Control and Prevention, May 2011

Source: EPA, July 2016
Urban Emissions: Leading Sources

74% of heavy-duty trucks not certified to latest NOx emission standard

26% of heavy-duty trucks meet NOx emissions standard

#1 Source of Urban Emissions
- Short-Haul
- Refuse
- Long-Haul
- School Buses
- Transit Buses

Source: DTF Analysis on IHS Vehicles in Operation Data, December 2015
The Solution

Increased Natural Gas Use in Transportation:
Sustainable, Responsible, Available & Domestic
Natural Gas is Now

(video at https://www.ngvamerica.org/resource/the-cleanest-commercial-engine-in-the-world-see-how-natural-gas-is-now/)
Paul Osbourn
National Sales Manager
Paul Shaffer
Executive Vice President
Myth #1:

With oil prices so low, it just doesn’t make economic sense to drive natural gas.
Natural Gas Provides Long-Term Fuel Cost Savings

Natural Gas vs. Oil:

- Historically 8:1 or better price advantage over oil on a Btu basis
- Pump prices today $0.75 to $1 lower than diesel

Projected Fuel-Price Differential
(prices per $DGE)

Source: U.S. Energy Information Administration
Natural Gas Provides Fuel Price Stability

Natural Gas:
- Decades of affordable domestic reserves
- Natural gas sourced from North America
- Commodity cost makes up 23% of sales price

Diesel:
- History of volatile price swings
- Crude oil sourced fuel from high-conflict regions
- Commodity cost makes up 60% of sales price
Myth #2: Natural gas technology is antiquated and unreliable.
CWI North American Products

- EPA/ARB Ultra Low emissions certification
- Lowest Emission HD engines in North America
- On-Board Diagnostics (OBD) applied for optimal emissions system performance
- Base warranty identical to diesel counterpart

Near-Zero Certified (0.02g NOx)
Peak rating: 400 hp, 1450 lb-ft
GVW: Up to 80,000 lbs

Near-Zero Certified (0.02g NOx)
Peak rating: 320 hp, 1000 lb-ft
GVW: Up to 66,000 lbs

Near-Zero Certified (0.10g NOx)
Peak rating: 240 hp, 560 lb-ft
GVW: Up to 33,000 lbs
Myth #3:
Natural gas technology’s environmental benefits are overblown.
The cleanest heavy-duty truck engine in the world is powered by natural gas

- Certified in 2018 by the U.S. Environmental Protection Agency and California Air Resources Board

The Cummins Westport Ultra-Low NOx engine is certified to a 0.02 g/bhp-hr standard, which is:

- 90% cleaner than the EPA’s current NOx standard
- 90% cleaner than the latest available diesel engine
NGVs Deliver the Largest & Most Cost-Effective NOx Emissions Reductions

Examples:
- Heavy Duty Trucks
- Refuse Trucks
- Transit Buses
- School Buses

Data Source: Emission comparisons based on ANL - HDVEC tool with low-NOx engines and higher in-use diesel emissions taken into account. Useful life, cost and mileage vary by applications. Additional details available from NGVA upon request.
Fueling with natural gas reduces CO₂ and greenhouse gas emissions.

Natural Gas Reduces WTW Greenhouse Gas Emissions

Compared to Diesel:
- LNG: 11% reduction
- CNG: 17% reduction

Source: NGVAmerica Emissions Whitepaper based on CARB LCFS
*Numbers compared to diesel emissions (well-to-wheel)
Renewable natural gas (RNG) provides even greater CO$_2$ and greenhouse gas emission reductions.

Heavy-Duty Vehicle Emissions Calculator (HDVEC)

- Simple online tool based on AFLEET to help analyze AFVs for funding opportunities
- Examines medium-duty & heavy-duty vehicle:
  - Vehicle operation NO\textsubscript{x} & PM\textsubscript{2.5}
  - Well-to-Wheel GHGs
  - Emission reduction cost effectiveness
- Contains 4 fuel/vehicle technologies:
  - Diesel
  - Electric vehicle
  - Propane
  - Natural Gas
- HDVEC available at: afleet-web.es.anl.gov/hdv-emissions-calculator/
Myth #4: Moving to natural gas is too complicated.
Agility Executive Overview

- Designer, developer, manufacturer and service provider of alternative energy systems and storage cylinders
- Global market presence with OEMs and major fleets
- Solutions include Hydrogen, CNG, LNG, Electric and Propane
- #1 market position, first mover in rapidly expanding market
- ~500 employees, including ~70 Agility engineers and technicians
- 10 locations worldwide
- Provided cylinders and/or fuel systems for over 60,000 commercial vehicles
- Aftermarket service network across North America
- Wholly-owned subsidiary of Hexagon Composites ASA (OSLO: HEX), which is 25% owned by Mitsui – strong profitability and capital resources
## Customer Value

- Single supplier for everything the fuel touches – “pump to tailpipe” – Agility as Manufacturer of Record
- Ownership of entire powertrain system design resulting in a complete engineered & certified system
- World class engineers designing innovative OEM & Aftermarket vehicle systems
- After sales service for technical support, service parts, maintenance, warranty – all at a single contact number
- Less lost time; improved customer experience will result in conquest sales growth

## Products & System Applications

- CNG & LPG Fuel Systems
- CNG & LPG Engine
- Service Parts
- CNG FCCC Chassis
- LPG FCCC Truck
- LPG Thomas Bus
- Propane Dispensers
- Field Service
- Training
World Class Customer Call Center
- Agents trained to assist in parts, tech service, and warranty
- Metrics measured to ensure customer experience
- Escalation to subject matter experts as needed
- Flexibility for integration to OEM call center

Field Service Support
- Technicians stationed in CA, MI, FL ready to deploy
- Service trucks able to de-fuel propane tanks

Service Parts
- Part fulfillment from NC, CA, MI warehouses
- Common parts available in on-line store (coming soon)
About 30% of transit buses operate on NG.
About 60% of all new refuse truck orders are NG.

Long & short haul truck market continues transition.

Rail industry piloting LNG locomotives.

NG Fits Every Application.

Ready-Right-Now Technology On and Off the Road Today.
Myth #5:

Natural gas vehicles might work for my fleet, but adding private refueling infrastructure is too expensive and public access is too inconvenient.
Diverse network of natural gas station developers

- Natural gas retail fuel sellers
- LDCs
- C-Stores
- Truck Stops
- Grocery/Warehouse stores
- Leasing companies
- Gas exploration & production
- Midstream pipeline
Natural gas fuel station infrastructure is continually expanding

≈2,000 Natural Gas Stations

Source: https://www.ngvamerica.org/fuel/
Myth #6: Upgrading my vehicle maintenance facilities to safely accommodate natural gas is too difficult and cost prohibitive.
PROTECT YOUR PEOPLE

Every NGV Easy Bay™ system is:

- The lowest cost code-compliant solution in the industry
- Designed & installed with your daily operations in mind
- Scalable, retractable & reconfigurable
- Certified by Clean Energy, the most trusted name in natural gas fueling

Installation Video: [NGV Easy Bay]
Join Us Next:

Alternative Fuel Garage Workshop
11:15 a.m. – 12:15 p.m.
Indiana Convention Center, Room 140
The Next Big Thing Isn’t Always New... But our website is.

Check out the new ngvamerica.org

The cleanest HD engines in the world run on natural gas.

NGVamerica.org

Your source for all NGV industry news and information.

If we want cleaner air, we need cleaner vehicles.

Natural Gas Vehicles are 99% cleaner than the EPA's current NOx standard and emit up to 21% fewer NOx emissions than comparable gas and diesel vehicles. When fueled with Renewable Natural Gas, NOx emissions can be reduced up to 98%.

Learn More