

# Natural Gas Refueling Infrastructure:

## Fueling the School Transportation of Tomorrow

Natural Gas School Bus Seminar

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## Clean Energy Corporate Overview

- ▶ Clean Energy (CE) is North America's largest natural gas (CNG and LNG) fuel provider for vehicle use
- ▶ 160+ stations in North America serving 25,000+ vehicles daily
- ▶ CE Model- Turn-Key Natural Gas Stations
  - Full-service from grant support, to commodity pricing, to on-going station operations and customer service
  - Private-only or Public-access stations
  - Clean Energy Finance



## Presentation Topics

- ▶ Types of natural gas refueling facilities
- ▶ Station components
- ▶ Project planning and Construction
- ▶ Station operations
- ▶ Safety and training
- ▶ Existing Public Access CNG stations on Long Island

# Types of Natural Gas Vehicle Fueling Infrastructure

- ▶ **Fast-fill**
  - On demand fueling
  - Independently metered fills
- ▶ **Time-fill**
  - Designed for centrally-fueled fleets
  - Manifold fuel posts
- ▶ Time-fill stations can have fast fueling capabilities



Courtesy Fuelmaker Corporation

## Components of a Station

- ▶ **Gas Dryer**
- ▶ **Compressor**
  - Compresses pipeline gas to high pressure
  - Gas or electric-driven power plant
- ▶ **Storage**
  - High pressure storage
  - Not necessary for time-fill
- ▶ **Dispensers or fuel posts**

# Planning For Natural Gas Infrastructure

- ▶ Is there available fueling nearby? If no:
  - Project Scoping
    - Site location and layout- setbacks to buildings, train tracks, high voltage, and property lines
    - Utilities- Gas and electric
    - Grants
  - Station Sizing
    - Daily consumption per bus
    - Fuel window
    - Near-term vs. future requirements
    - Fast-fill?
  - Inform and involve local fire officials
  - Consult local NG fuel providers or station designers

# Station Operations

- ▶ Maintenance
- ▶ Costs per Gallon Dispensed
  - Fixed
    - Maintenance staff
    - Electricity demand
    - Capital cost recovery
  - Variable
    - Parts and materials
    - Compression costs- gas and electric (energy)
- ▶ Proper station sizing and volume throughput are **IMPORTANT** factors for cost effective station operation

## Safety and Training

- ▶ Safety and Training Resources:
  - National Fire Protection Association Standards
    - [www.NFPA.org](http://www.NFPA.org)
  - NGV Institute
    - [www.NGVI.com](http://www.NGVI.com)
  - National Alternative Fuel Training Consortium
    - [www.NAFTC.wvu.edu](http://www.NAFTC.wvu.edu)
  - Alternative Fuels Data Center- USDOE
    - [www.eere.doe.gov/AFDC](http://www.eere.doe.gov/AFDC)

# Long Island's Existing Public NGV Fueling Network

- ▶ Clean Energy/NYS OGS stations
  - Syosset, Hauppauge, and LGA
  - 24/7 public access
  - **Contact Tara McManus– (718) 389-0310**
- ▶ Keyspan Energy Delivery
  - Hewlett, Hicksville, Brentwood, Riverhead
  - **Contact Ron Gulmi– (516) 545-5164**
- ▶ Other non-public government facilities
- ▶ For planned projects contact GLICC
  - **Contact Andria Adler (631) 969-3700**

# Thank You

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