Natural Gas: Fueling Innovation

Delmarva Winter Freight Summit
Energy Lane, Dover, DE
December 4, 2019
Safety Minute: Two Numbers

Know what’s below. Call before you dig.

Call 811®

911
1859: Dover Gas Light Company, Dover, DE
Energy Lane Campus - Dover, DE

56,000sf of office space
33,000sf of warehouse space
20.6 acres

Chesapeake Utilities &
Eastern Shore Natural Gas

Golden Globes Certified
by the Green Building Initiative
Service Territories

- **Delaware and Maryland**
  - Natural Gas Transmission,
    - Natural Gas Distribution
  - and Propane Distribution

- **Virginia**
  - Propane Distribution

- **Pennsylvania**
  - Natural Gas Transmission
  - Propane Distribution

- **Florida**
  - Natural Gas Transmission and Distribution,
    - Electricity Distribution, Combined Heat & Power Plant
  - Propane Distribution

- **Ohio**
  - Natural Gas Gathering,
    - Liquids Processing and Distribution
The Energy Value Chain

- **Upstream**
  - Drilling / Exploration
  - Gathering / Processing
  - Propane Storage
  - Wholesale Logistics

- **Midstream**
  - Power Generation
  - Intrastate / Interstate Pipelines
  - Energy Marketing & Trading

- **Downstream**
  - Local Distribution Companies (LDCs) and Cooperatives
  - Distributed Generation
  - CNG Fueling
  - Propane Fueling
  - Demand Projects
  - Propane Distribution
  - Local Distribution Companies (LDCs) and Cooperatives

**Categories:**
- Demand Projects
- Distributed Generation
- Propane Distribution
- Energy Marketing & Trading
- Propane Fueling
- CNG Fueling
- Local Distribution Companies (LDCs) and Cooperatives
- Drilling / Exploration
- Gathering / Processing
Chesapeake Utilities Service Area

83,000+ natural gas customers in Maryland and Delaware
Benefits of Natural Gas

**CLEAN**
Direct use of natural gas can cut carbon emissions nearly in half when natural gas is consumed directly for heating and cooling, water heating and other applications.

**DOMESTIC**
About 98% of the natural gas used in North America comes from North America, helping to make the U.S. more energy independent and less vulnerable to volatile oil pricing.

**SAFE**
According to the National Transportation Safety Board, natural gas pipelines are the safest form of energy transportation - safer than truck or rail. The commitment to safety can be seen through the industry’s $22 billion a year investment in safety programs.

**EFFICIENT**
92% of the natural gas delivered to customers is usable energy, compared to electric end-use products which maintain only 32% usable energy.

**ABUNDANT**
The current domestic natural gas base is large enough to meet current U.S. energy needs for more than 100 years.

**PREFERRED**
Across the U.S., natural gas is used in roughly 68 million homes, 5.4 million commercial and public buildings including schools and hospitals, and 192,000 factories.
Natural Gas Facts

Approaches 100% reliability

When natural gas is used directly, it can achieve up to 92% energy efficiency

Safest form of energy transportation

Natural gas emits up to 56% fewer greenhouse gases than coal for the same amount of electricity

Used in roughly 5.4 million commercial and public buildings including schools and hospitals, and 192,000 factories in the U.S.

98% of natural gas used in this country is domestically produced

In 2016, natural gas accounted for more than 33% of electricity generation in the U.S.

“Enhanced usage of natural gas is the single most effective way for the world to reduce emissions responsibly.” (igu.org)
# Commercial & Industrial Accounts

## Asphalt Plants
- River Asphalt
- Independence Construction Materials
- Tri-Count Materials
- Christiana Materials

## Breweries / Distilleries
- Crooked Hammock
- Dogfish Head
- Evolution (EVO)

## Colleges & Universities
- Delaware State University
- Delaware Tech (Georgetown and Dover)
- Salisbury University
- Wesley College
- Wor-Wic Community College
- University of Maryland Eastern Shore (future)

## Corrections
- Delaware Dept of Corrections
- Maryland Dept of Public Safety and Corrections

## Dover Air Force Base

## Food Manufacturing
- Kelly Foods / Bil-Jac Dog Food
- Kraft Heinz
- The Mushroom Company
- Phillips Mushroom
- Protenergy
- Ralph & Paul Adams
- Sea Watch

## Hospitals
- Atlantic General Hospital (Berlin)
- Beebe (Lewes)
- Bayhealth (Milford)
- Nanticoke Memorial (Seaford)
- Peninsula Regional Medical Center (Salisbury)

## Hospitality
- Hilton
- Hyatt
- Marriott

## Manufacturing
- Baltimore Air Coil
- Datwyler
- Edgewell-Playtex
- Invista
- Johnson Controls
- Orient Corp
- Proctor & Gamble
- Quikrete
- Solo Cup

## Pharmaceuticals
- Cadista
- Intervet / Merck
- SPI Pharma
- Sunmed

## Poultry Industry
- Allen Harim
- Amick Farms
- Mountaire Farms
- Perdue
Price Comparisons & Power Gen Shift

Energy Prices: Transportation

2018 $/MMBtu
Case: Reference case | Region: United States

U.S. net electricity generation from select fuels
billion kilowatthours

2016 history projections
Reference case

coal
natural gas
nuclear
renewable energy
petroleum

Source: U.S. Energy Information Administration

2019 Annual Energy Outlook
Natural Gas for Your Project
Service Lines and Main Extensions

• New Service Lines up to 75’ (from existing mains) installed at no cost.
• Service Lines over 75’ subject to a six (6) times annual non-fuel revenue test.
• Main Extensions subject to the 6x annual non-fuel revenue test.
• When the investment in gas facilities exceeds projected revenues, the customer can:
  • Pay a CIAC (Contribution in Aid of Construction)
  • Provide a Customer Advance
  • Negotiate a Delivery Rate
Other Services

• Build, Own, Operate and Maintain (BOOM)
• Conversion Coordination
• Negotiated Contract Rates
  • Use to recover gas line installation and equipment conversion costs.
• Temporary Propane Service
• On-Bill Loan Servicing
• Virtual Pipeline
  • Tube trailer delivery of CNG to off-main customers
Project Support

• **Identify Project Potential.**
  • Is natural gas technology the best fit?

• **Gas Pricing Scenarios**
  • Improved Rate Class Impact
  • 3rd-Party Supply Savings

• **Initial Payback Analyses**

• **Life-Cycle Cost Analysis support**

• **Grant & alternative funding help**
  • EEIF
  • SEU loans

• **3rd Party Gas Supply**

• **Supportive Service Agreements**
Natural Gas Technology
Space Heat Options

- Forced Warm Air Systems
- Make Up Air Systems
- Thru the Wall Furnaces
- Unit Heaters
- Heat Pumps
- Infrared Unit Heaters
- Combo System
  Space and Water Heat
- Boilers for Building Heat
  Combine w/ Hydronic Floor Heating
Industrial Boilers

Hot water and steam for process needs and space heat
Cooling Options

Absorption Chillers
(Seaford High School)

Gas Heat Pumps
(Del-Tech, Chesapeake)

Engine Driven Chillers

Steam Turbine Driven Chillers
Combined Heat & Power (CHP)

Power Generation Equipment Options

- **Reciprocating Engines**
  - (80 KW - 8 MW)

- **Micro – Turbines**
  - (30 – 1000 KW)

- **Turbines**
  - (1,000 KW – 40 MW)

- **Fuel Cells**
  - (10 – 500 KW)

Source: www.epa.gov/chp/documents/clean_energy_solution.pdf
On-site CHP generates electricity and captures waste heat simultaneously, increasing efficiency and providing energy savings and emissions reductions.
3MW Installation by Unison Energy

Twin Reciprocating Engine Plant

Annual CO2 Reduction: 50%

Annual NOX Reduction: 15%

Total GHG Emissions Reduction: 50%

Annual Savings (Gas & Electric): $700,000+

Payback: < 8 years ---- out of 20-year life cycle

Total Savings: 12 years X $700,000+ = $8,400,000+

Gas Heat Pump (GHP)

- Alternative to VRF electric heat pumps
- Environmentally friendly
- Reduces heat and cooling costs
- Reducing electric demand changes and consumption
- Energy efficient waste heat recovery

YANMAR

14 tons
189,000 BTU heating capacity
VRF – Variable Refrigerant Flow
Available 3-pipe configuration (simultaneous heat/cool)
Connect up to 29 indoor units (130% of rated capacity)
Compressed Natural Gas (CNG)
For Fleets & Freight
Fleet NGV – Fuel Savings for Your Fleet

New CNG Station
Energy Lane, Dover, DE

Over 250,000 NGVs operating in the United States

Cleaner emissions
Lower fuel cost
Lower maintenance cost
Longer engine life
Quieter engines

Natural Gas Vehicles emit over 20% fewer GHG emissions than comparable gasoline and diesel vehicles on a well-to-wheel basis. (ngvamerica.org)
Energy Lane CNG Statistics

Average Monthly Total GGEs Dispensed


Average Monthly Total # of Fills


Average Monthly Total Vehicles Served

Renewal Natural Gas: RNG for Freight Fleets

UPS Case Study

• **1,700** CNG vehicles since 2016

• **6,000** additional CNG vehicles by 2022

• **230 Million GGEs of RNG** (gallon gasoline equivalent) purchased over next 7 years for use in CNG vehicle

Renewable Identification Numbers (RINs)

RINs and RNG

- RIN is proof of compliance with Renewable Fuel Standard (RFS)
- RIN is tied to each gallon of biofuel produced
- RINs can be turned into EPA to prove compliance with RFS
- Excess RINs can be sold on the market to other refiners

RNG on Delmarva

- November 21, 2019 Announcement
- 20-year partnership
- Cost-savings
- Produce renewable energy (RNG)
- Address soil health and nutrient management in Chesapeake Bay watershed

CNG as Freight: “Virtual Pipelines”

Delivering Compressed Natural Gas to off-main customers.
Contact Info

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