# Natural Gas: Fueling Innovation

Delmarva Winter Freight Summit Energy Lane, Dover, DE December 4, 2019



## **Safety Minute: Two Numbers**







## **1859: Dover Gas Light Company, Dover, DE**



LOCKERMAN STREET FROM POSTOFFICE-DOVER, DELAWARE.



## **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







## **Corporate Branding**





## **Service Territories**

### **Delaware and Maryland**

Natural Gas Transmission, Natural Gas Distribution and Propane Distribution

### <u>Virginia</u>

**Propane Distribution** 

### <u>Pennsylvania</u>

Natural Gas Transmission Propane Distribution

### <u>Florida</u>

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

### <u>Ohio</u>

Natural Gas Gathering, Liquids Processing and Distribution



## **The Energy Value Chain**





## **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.





#### ABUNDANT

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



#### 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.



### 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** 

Safest form of energy transportation

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

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



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

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

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

"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



## **C&I** Natural Gas Customers





## **Price Comparisons & Power Gen Shift**

#### **Energy Prices: Transportation**



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



U.S. Energy Information Administration

#AEO2017



# **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



![](_page_14_Picture_9.jpeg)

## **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

![](_page_15_Picture_9.jpeg)

![](_page_15_Picture_10.jpeg)

# **Project Support**

- Identify Project Potential.
  - Is natural gas technology the best fit?
- Gas Pricing Scenarios
  - Improved Rate Class Impact
  - 3<sup>rd</sup>-Party Supply Savings
- Initial Payback Analyses
- Life-Cycle Cost Analysis support
- Grant & alternative funding help
  - EEIF
  - SEU loans
- 3<sup>rd</sup> Party Gas Supply
- Supportive Service Agreements

![](_page_16_Picture_13.jpeg)

![](_page_16_Picture_14.jpeg)

# Natural Gas Technology

![](_page_17_Picture_1.jpeg)

## **Space Heat Options**

![](_page_18_Picture_1.jpeg)

![](_page_18_Picture_2.jpeg)

## **Industrial Boilers**

Hot water and steam for process needs and space heat

![](_page_19_Picture_2.jpeg)

![](_page_19_Picture_3.jpeg)

# **Cooling Options**

# Absorption Chillers (Seaford High School)

![](_page_20_Picture_2.jpeg)

## **Gas Heat Pumps** (Del-Tech, Chesapeake)

![](_page_20_Picture_4.jpeg)

## **Engine Driven Chillers**

![](_page_20_Picture_6.jpeg)

![](_page_20_Picture_7.jpeg)

## Steam Turbine Driven Chillers

![](_page_20_Picture_9.jpeg)

# **Combined Heat & Power (CHP)**

**Power** 

**Options** 

![](_page_21_Picture_1.jpeg)

Source: www.epa.gov/chp/documents/clean energy solution.pdf

![](_page_21_Picture_3.jpeg)

# **Combined Heat and Power (CHP)**

![](_page_22_Figure_1.jpeg)

On-site CHP generates electricity and captures waste heat simultaneously, increasing efficiency and providing energy savings and emissions reductions.

![](_page_22_Picture_3.jpeg)

# **CHP at PRMC in Salisbury**

**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+

![](_page_23_Picture_9.jpeg)

https://www.peninsula.org/news/governor-larry-hogan-unveils-new-combined-heat-and-power-system-peninsula-regional-medical

![](_page_23_Picture_11.jpeg)

# Gas Heat Pump (GHP)

# YANMAR

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

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)

![](_page_24_Picture_8.jpeg)

![](_page_24_Picture_9.jpeg)

# Compressed Natural Gas (CNG) For Fleets & Freight

![](_page_25_Picture_1.jpeg)

# Fleet NGV – Fuel Savings for Your Fleet

![](_page_26_Picture_1.jpeg)

## 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)

![](_page_26_Picture_5.jpeg)

## **Energy Lane CNG Statistics**

![](_page_27_Figure_1.jpeg)

![](_page_27_Figure_2.jpeg)

Average Monthly Total Vehicles Served

![](_page_27_Figure_4.jpeg)

![](_page_27_Picture_5.jpeg)

# **Renewal Natural Gas: RNG for Freight Fleets**

![](_page_28_Figure_1.jpeg)

### Trash to Gas

Renewable natural gas (RNG), or biomethane, is derived from many abundant renewable sources, including decomposing organic waste in landfills, wastewater treatment, and agriculture. RNG can be used in any natural gas vehicle. Our commitment to investing in natural gas infrastructure offers a unique opportunity to use this fuel in our extensive fleet.

![](_page_28_Figure_4.jpeg)

## **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

https://agilityfuelsolutions.com/press-releases-archive/ups-to-add-more-than-6000-vehicles-to-its-natural-gas-fleet/

![](_page_28_Picture_10.jpeg)

# **Renewable Identification Numbers (RINs)**

![](_page_29_Figure_1.jpeg)

## **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

![](_page_29_Picture_7.jpeg)

https://growthenergy.org/2018/07/24/rins-101-the-basics-of-renewable-identification-numbers/

## **RNG on Delmarva**

![](_page_30_Picture_1.jpeg)

![](_page_30_Picture_2.jpeg)

SPONSORED CONTENT

EVENTS

SPECIAL EDITIONS

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

![](_page_30_Picture_8.jpeg)

https://www.delawarebusinesstimes.com/bioenergy-devco-acquires-perdues-del-compost-plant/

LISTS AND LEADS

![](_page_30_Picture_10.jpeg)

DIGITAL EDITION

# CNG as Freight: "Virtual Pipelines"

![](_page_31_Figure_1.jpeg)

![](_page_31_Picture_2.jpeg)

**Delivering Compressed Natural Gas to off-main customers.** 

![](_page_31_Picture_4.jpeg)

## **Contact Info**

## **Dave Detrick**

Manager of Sales & Pre-customer Integration

## **Chesapeake Utilities**

500 Energy Ln, Ste 100 Dover, DE 19901 ddetrick@chpk.com 302-736-7829

## **Jared Shelton**

Commercial & Industrial Account Manager

## **Chesapeake Utilities**

32145 Beaver Run Drive Salisbury, MD 21804 jshelton@chpk.com 443-493-1782

![](_page_32_Picture_9.jpeg)