Southern Company

Energy Transition & the Role of Natural Gas

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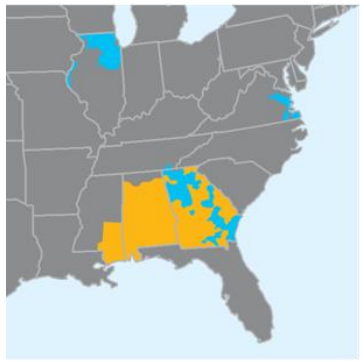
Vice President of Gas Operations

Southern Company Gas

We provide clean, safe, reliable, affordable energy and customized solutions

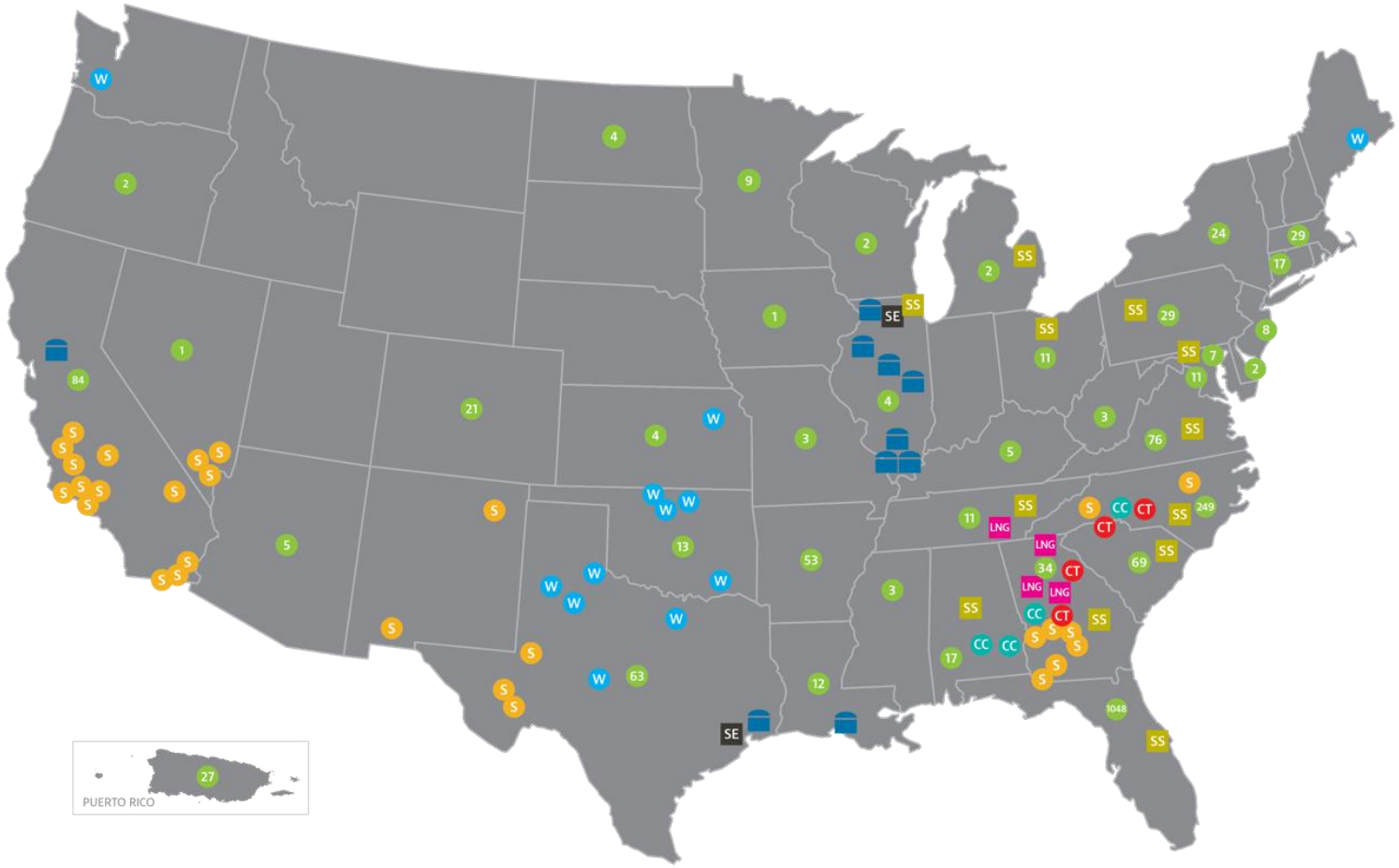


Service territories

- Electric
- Gas

Southern Power

- Combined-cycle facility
- Peaking facility
- Solar facility
- Wind facility



Capabilities in
50 States

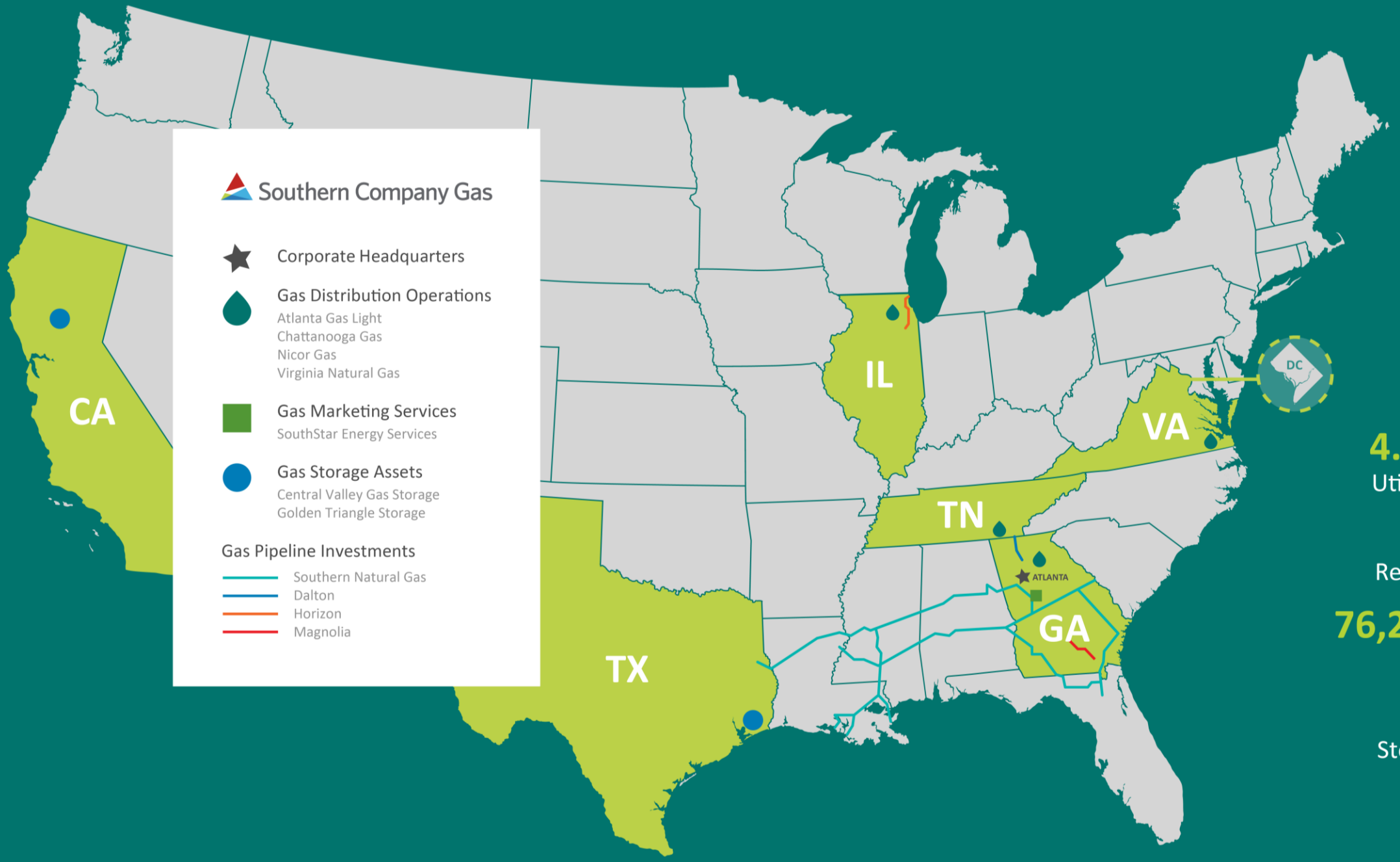
7
Electric & Natural Gas Utilities

9 Million
Customers

Approximately
28,000
Employees

Approximately
42,000 MW
of Generating Capacity

Southern Company



2021 Stats

4.3 Million
Utility Customers

600,000
Retail Customers

76,289 Miles
of Pipe

180 Bcf
Storage Capacity

4,500
Employees

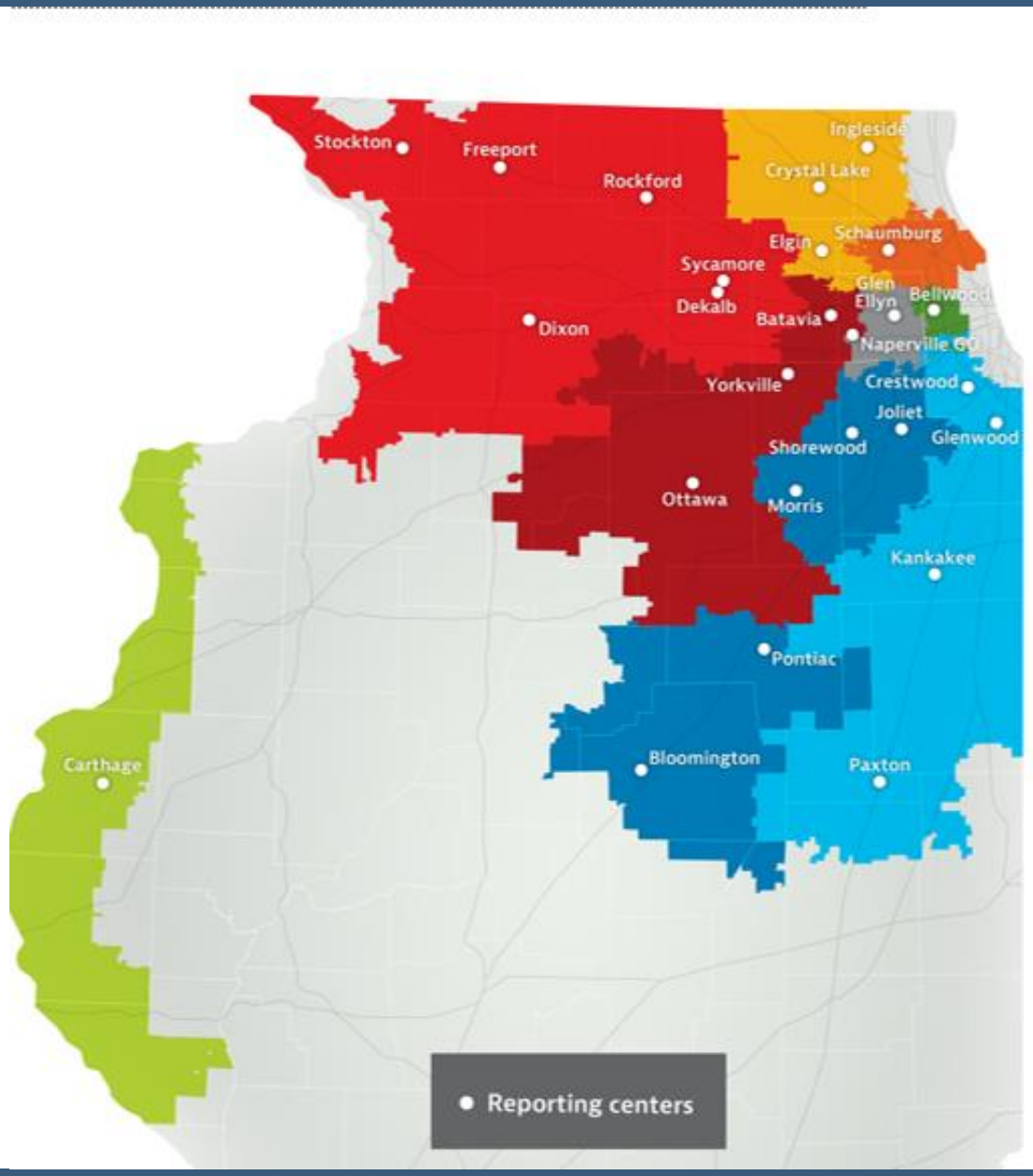
Nicor Gas

2.2 million customers

656 communities

34,000 miles of pipe

8 storage fields



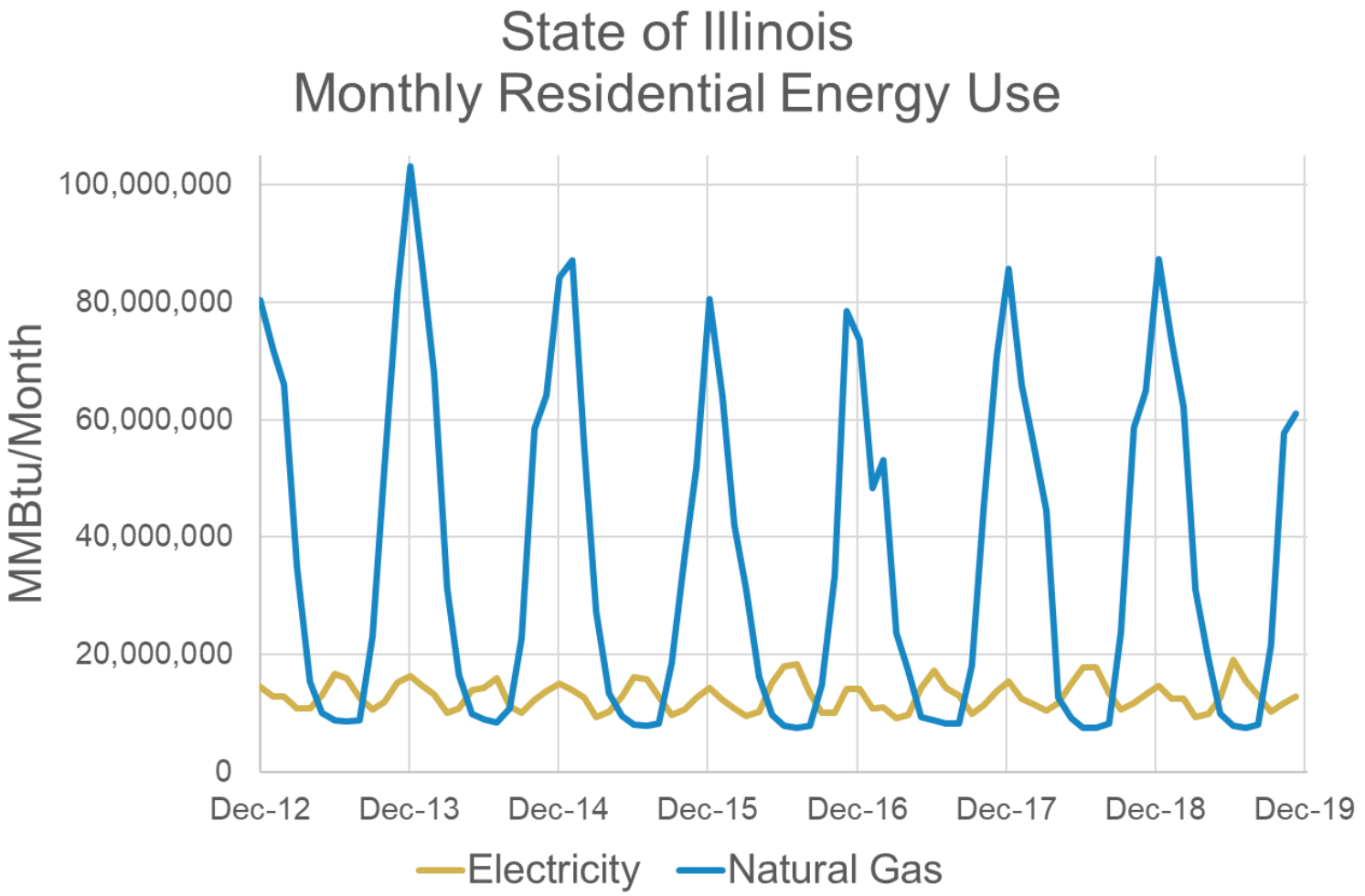
Natural Gas Plays a Foundational Role in the US Energy Ecosystem

- Nearly **187 million Americans** use natural gas in their homes, and more than **5.5 million businesses** rely on natural gas daily
- The U.S. has **2.6 million miles of pipeline** infrastructure network
- **1,900 natural gas power stations** deliver 40 percent of the total power production in the U.S.
- Natural gas is **more affordable** than other energy sources, saving customers an average of over $1,000 per year
- Over the last 15 years, natural gas is responsible for lowering greenhouse gas emissions – more than **47% in power generation sector**

Reliability and Resilience

Natural Gas Energy Delivery

NATURAL GAS INFRASTRUCTURE IS FOUNDATIONAL TO TRANSPORTING AND DELIVERING ENERGY RELIABLY AND RESILIENTLY.



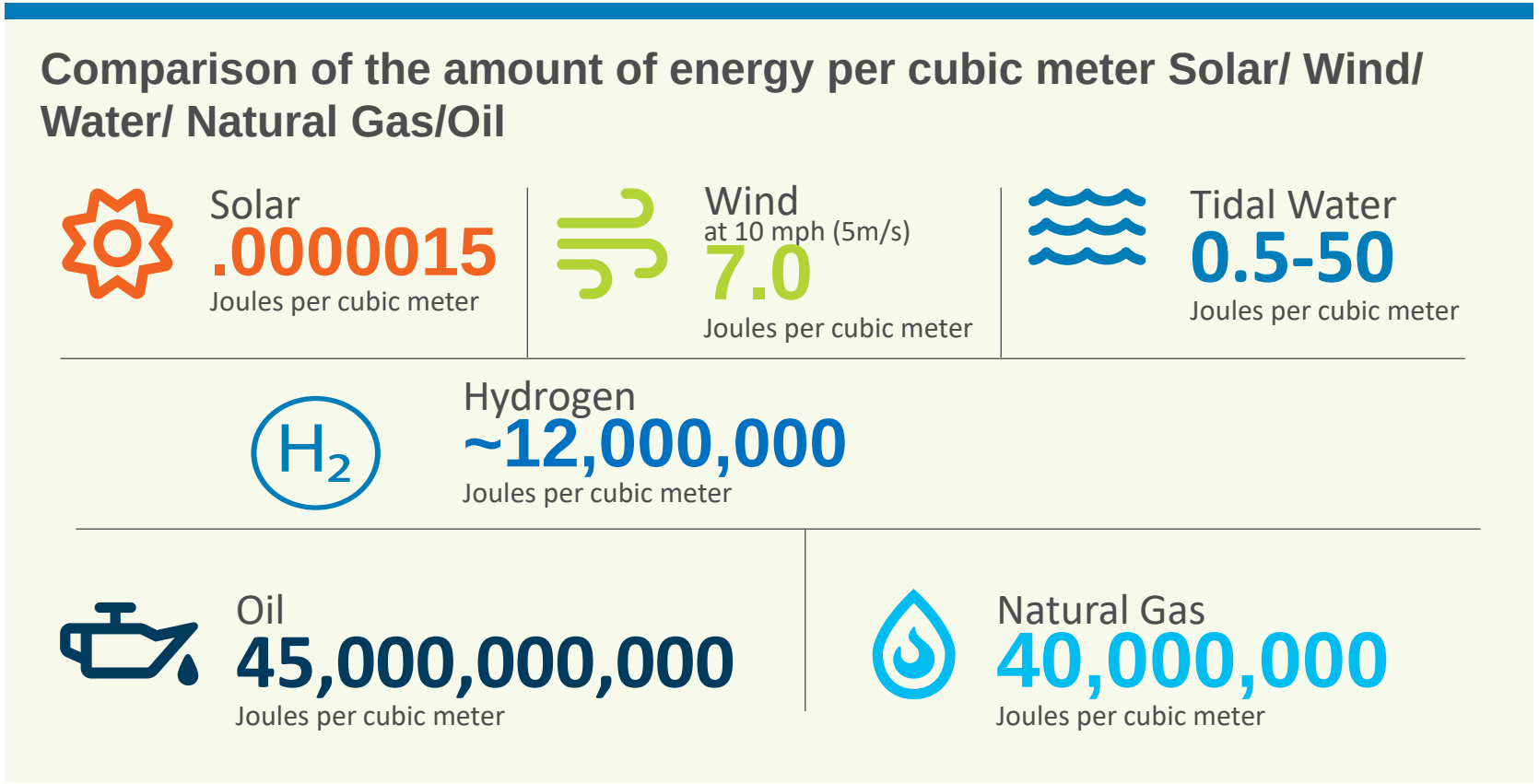
In Illinois, residential natural gas monthly peak energy usage is over

5X

greater than the electricity monthly peak

Source: DOE-EIA

Energy Density will be an important factor in determining practical and affordable future solutions

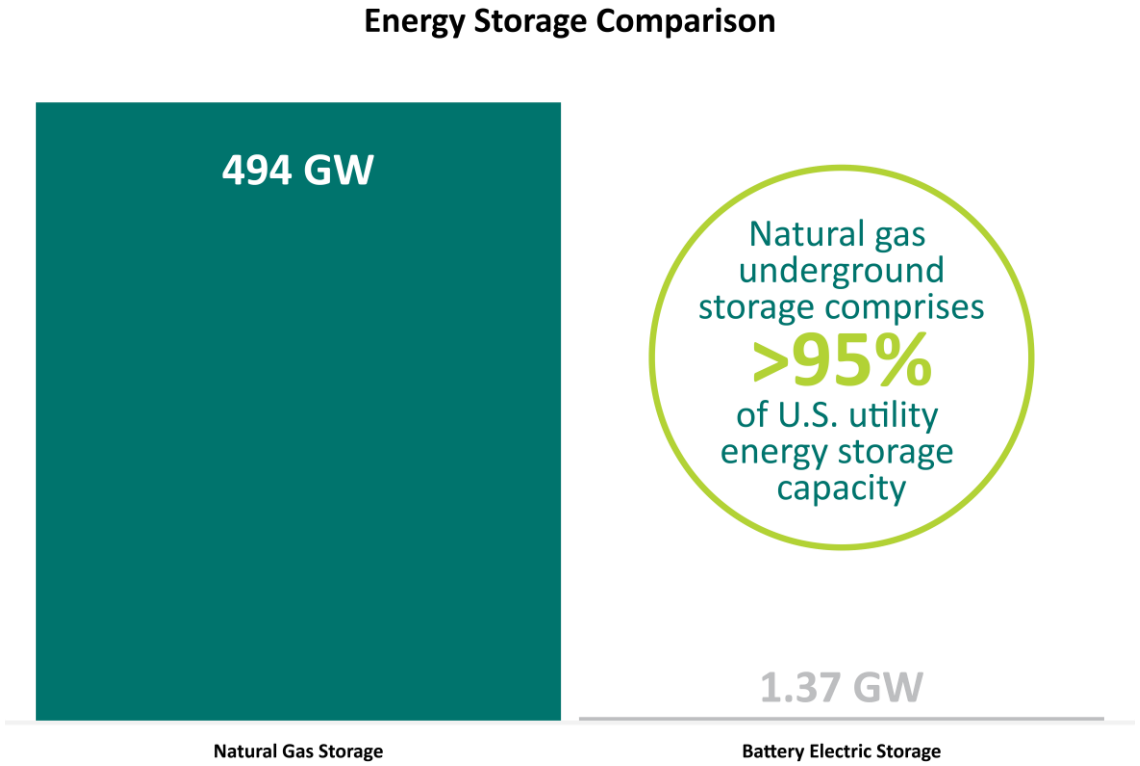


Source: Bradley Layton, Mechanical Engineering Dept. at Drexel University

Natural Gas Energy Storage

NATURAL GAS PIPELINES AND STORAGE RESERVOIRS ARE MOST COST-EFFECTIVE AND EFFICIENT ENERGY WHEN COMPARED TO BATTERY ELECTRIC STORAGE.

- Gas pipelines are highly cost-effective, safely out of sight, and less vulnerable to weather impacts.
- Natural gas energy storage has scale & long-duration discharge features that are vastly greater than battery energy storage systems.



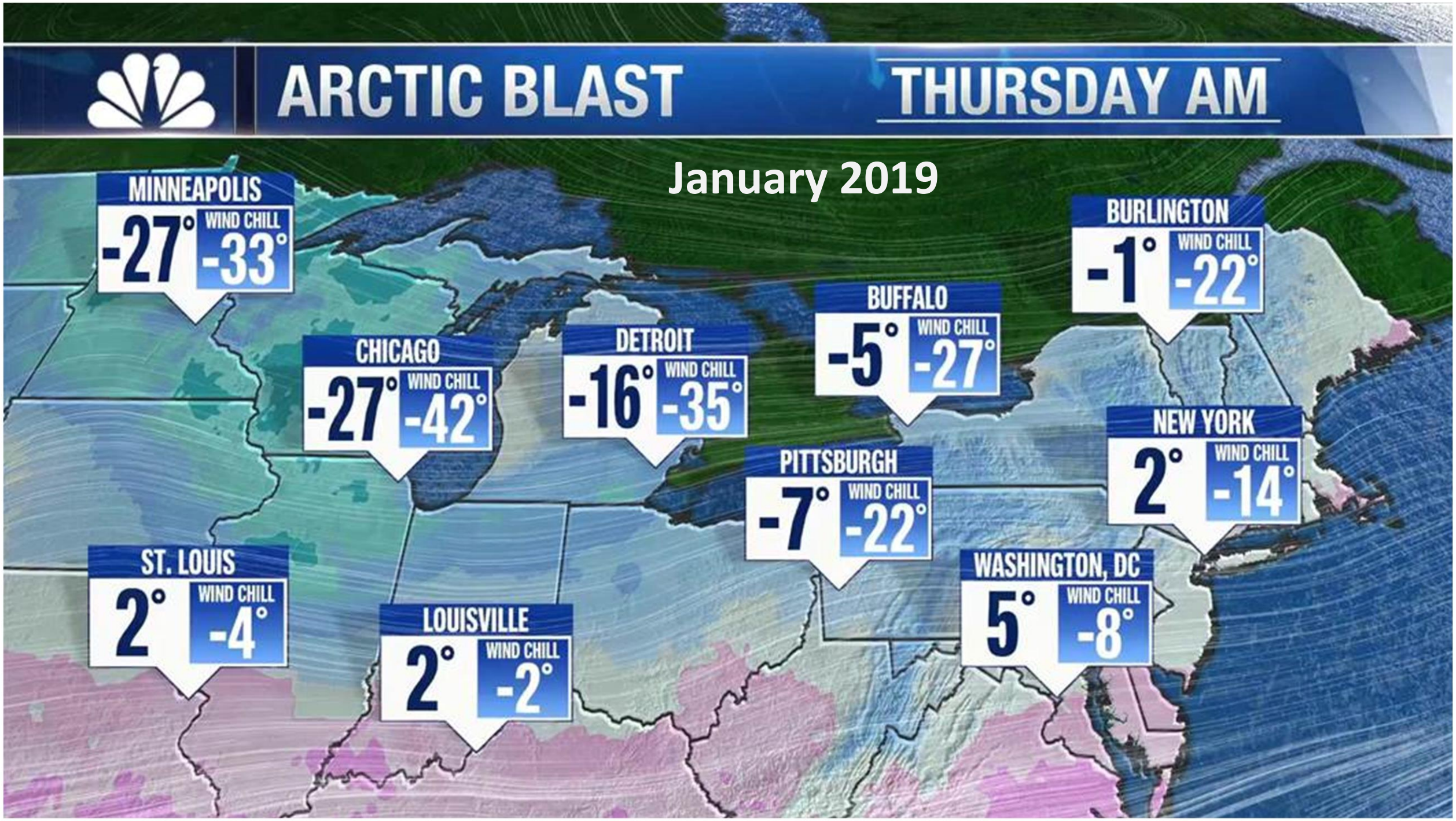
Source: DOE-EIA

UNPLANNED OUTAGES

1 in 800 Natural gas customers experience an unplanned outage each year.

Electric distribution systems have an average of **one outage** per year per customer.

Source: American Gas Association

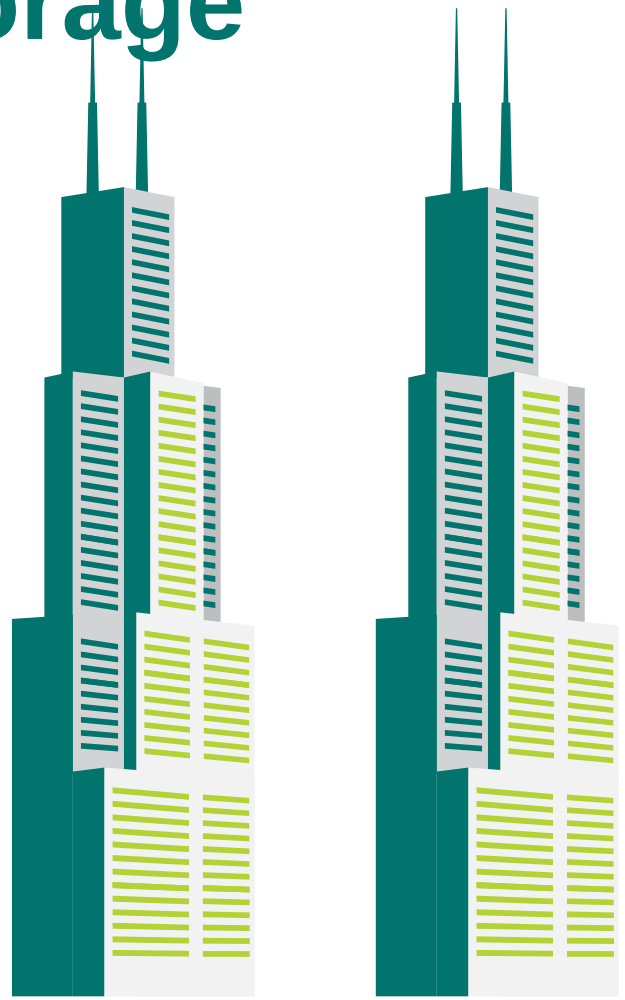

ARCTIC BLAST
THURSDAY AM
January 2019
MINNEAPOLIS
-27°
WIND CHILL
-33°
CHICAGO
-27°
WIND CHILL
-42°
DETROIT
-16°
WIND CHILL
-35°
BUFFALO
-5°
WIND CHILL
-27°
BURLINGTON
-1°
WIND CHILL
-22°
NEW YORK
2°
WIND CHILL
-14°
PITTSBURGH
-7°
WIND CHILL
-22°
WASHINGTON, DC
5°
WIND CHILL
-8°
ST. LOUIS
2°
WIND CHILL
-4°
LOUISVILLE
2°
WIND CHILL
-2°

Meeting the Demands of Today
Natural Gas Underground Storage

COST-EFFECTIVE AND EFFICIENT RESOURCES TO MEET PEAK DEMAND RELIABLY

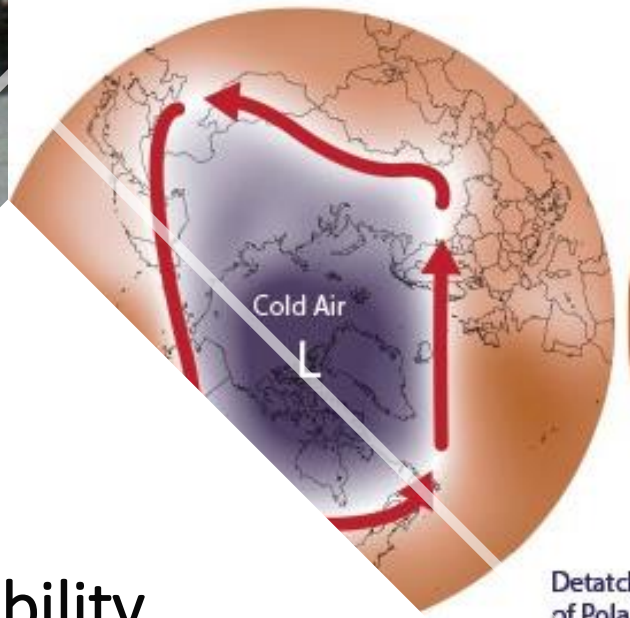
On consecutive polar vortex days in late January 2019, Nicor Gas withdrew from storage about 1.5 bcf/day followed by 1.6 bcf/day of gas (together equal to 912 million kWh)

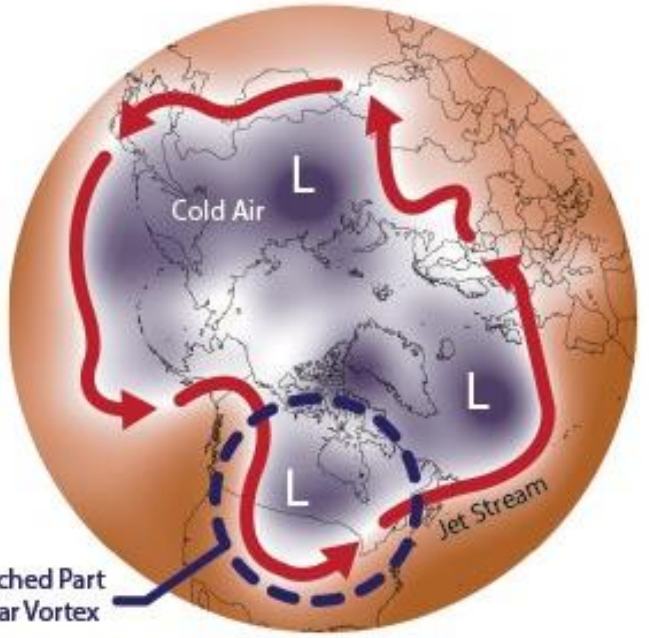
- Would require 228,000 MW of battery energy storage plants costing nearly $300 billion
- These plants would occupy a volume of two Willis (Sears) Towers and a weight of over 16 Willis Towers
- This does not consider operational feasibility – this is simply an energy-to-energy comparison



Assumes $330/kWh of battery capital costs from a 2021 NREL analysis for Utility-Scale Battery Storage

Source: GTI





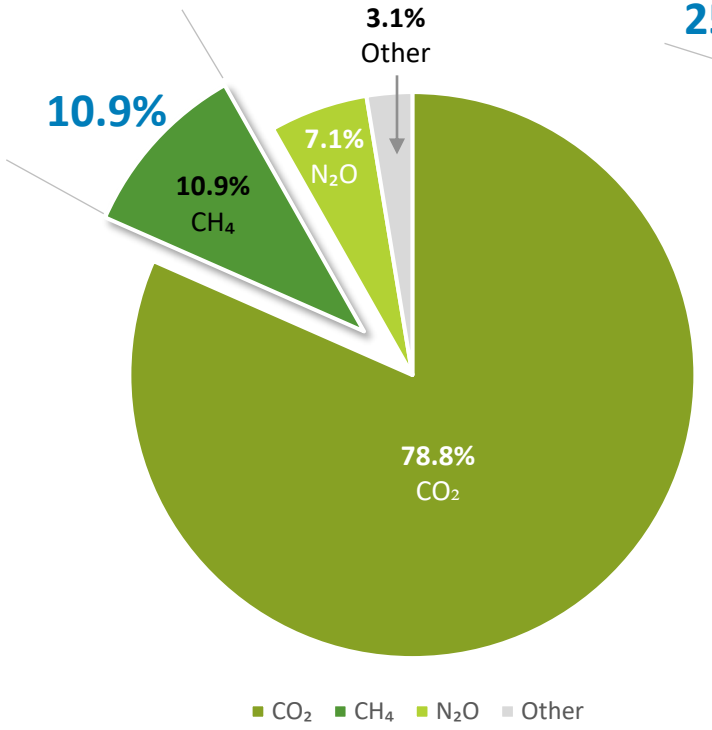
Reliability, Resiliency and Safety

Our Transition to the Future

Gas Distribution Companies are Extremely Small Contributors of CH_4

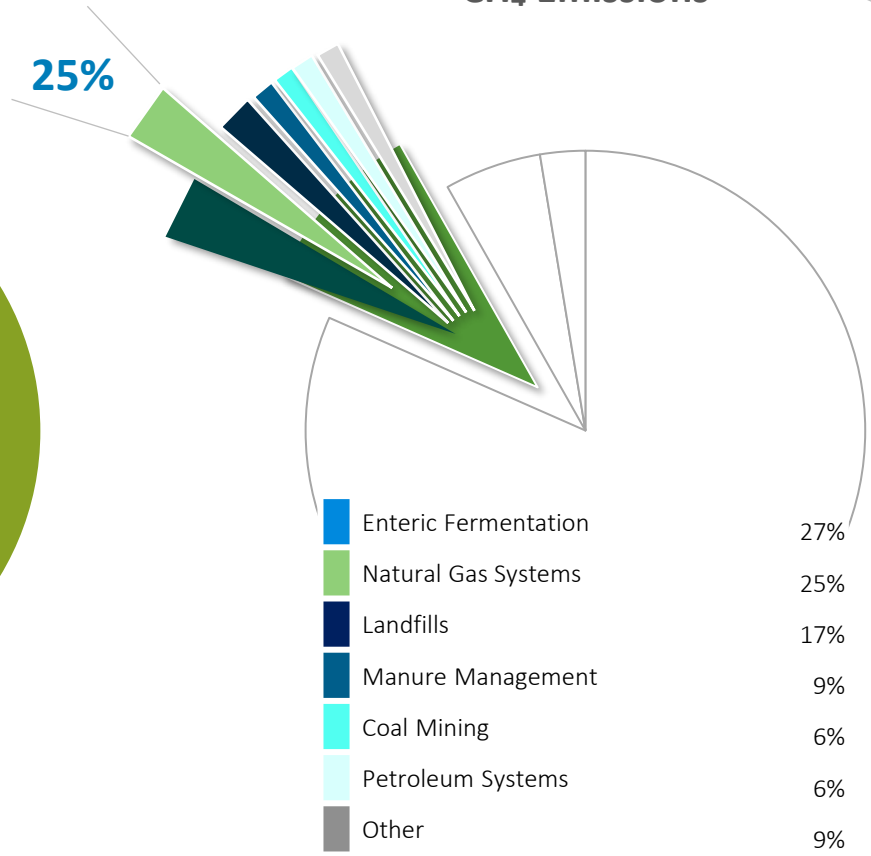
5973.0 $MMtCO2_e$

All GHG Emissions



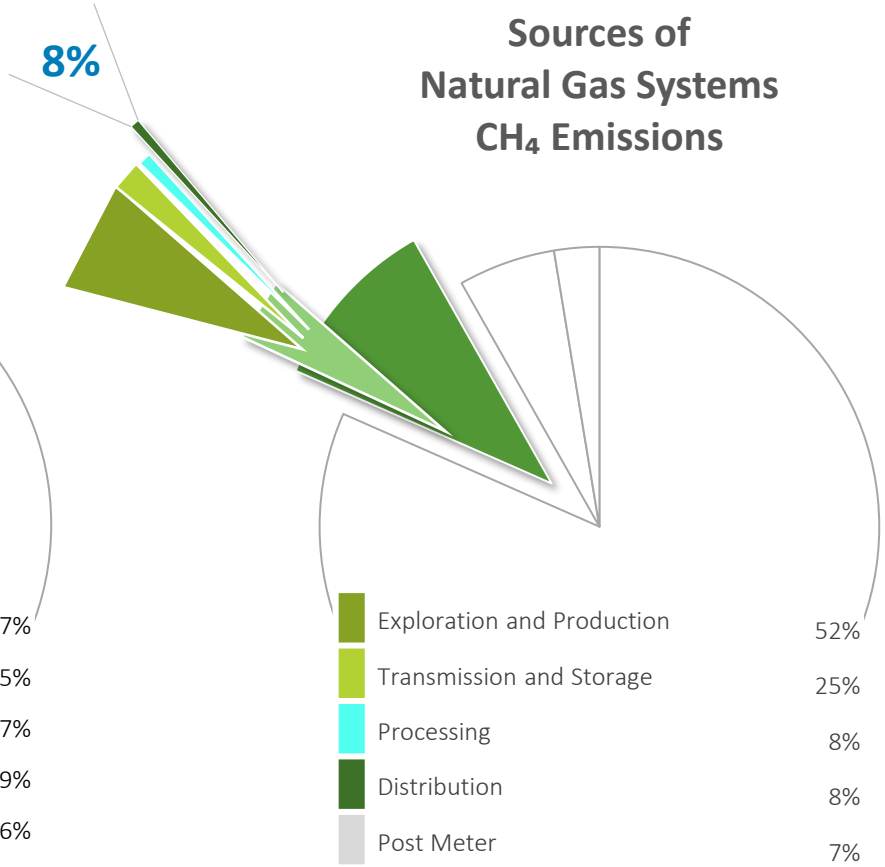
650.3 $MMtCO2_e$

Sources of CH_4 Emissions



164.5 $MMtCO2_e$

Sources of Natural Gas Systems CH_4 Emissions

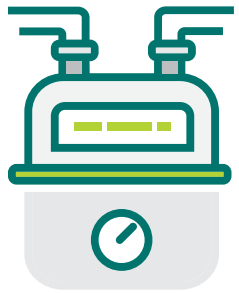


All data is from draft EPA report for 2020

A Shared Commitment to Emissions Reductions

- Southern Company has established a goal to reduce its enterprise-wide greenhouse gas emissions 50% from 2007 levels by 2030 and a long-term goal of net-zero by 2050.

- This is inclusive of Southern Company Gas operations. We also are focused on opportunities to support emissions reductions across the natural gas value chain – targeting upstream, operational and end-use emissions.



INFRASTRUCTURE MODERNIZATION

CNG and NGVs

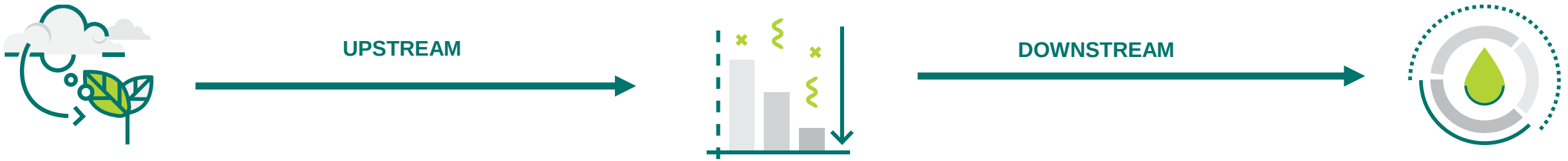
RENEWABLE FUELS

EMPOWERING CUSTOMER SUSTAINABILITY

METHANE EMISSIONS REDUCTIONS ACROSS OPERATIONS

R&D INVESTMENT

Implementation of Net Zero Pathway



Next Generation Natural Gas

- Industry engagement and coalitions
- ESG integrated into gas supply RFP process
- Next Generation Natural Gas supply for traditional natural gas
- GTI Veritas sponsorship
- Renewable gas

Net Zero Operational Emissions

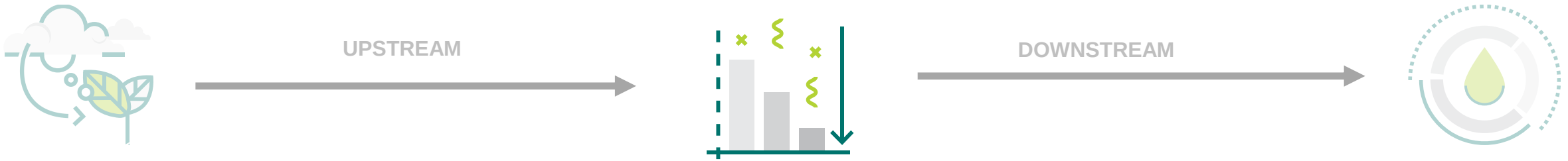
- Pipeline modernization
- Advanced leak detection and repair
- Equipment mitigation efforts
- Damage prevention
- Fleet
- Renewable gas

Empowering Our Customers and Communities

- Energy efficiency
- Next generation natural gas technology
- Customer programs
- Natural gas vehicles
- Stewardship
- Renewable gas

Net Zero Operations Emissions

Implementation of Net Zero Pathway



Net Zero Operational Emissions

- Pipeline modernization:
  - **OVER $2.5 Billion invested and 50% Reduction in Emissions since 1998**
- Equipment mitigation efforts:
  - **Flaring and Cross-compression**
- Advanced leak detection and repair:
  - **Shortened windows between discovery & repair**
- Leak Measurement
- Damage prevention

Advanced Leak Detection Technology

- Advances Leak Detection Capabilities
- Better Replacement Decisions and Informs Pipeline Repair
- Provides Emissions Quantification (cubic feet per hour)

Predictive Analytics Prevents Damages

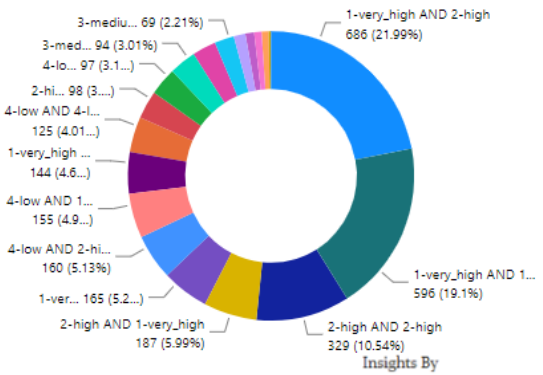
2406
 # Risks Identified

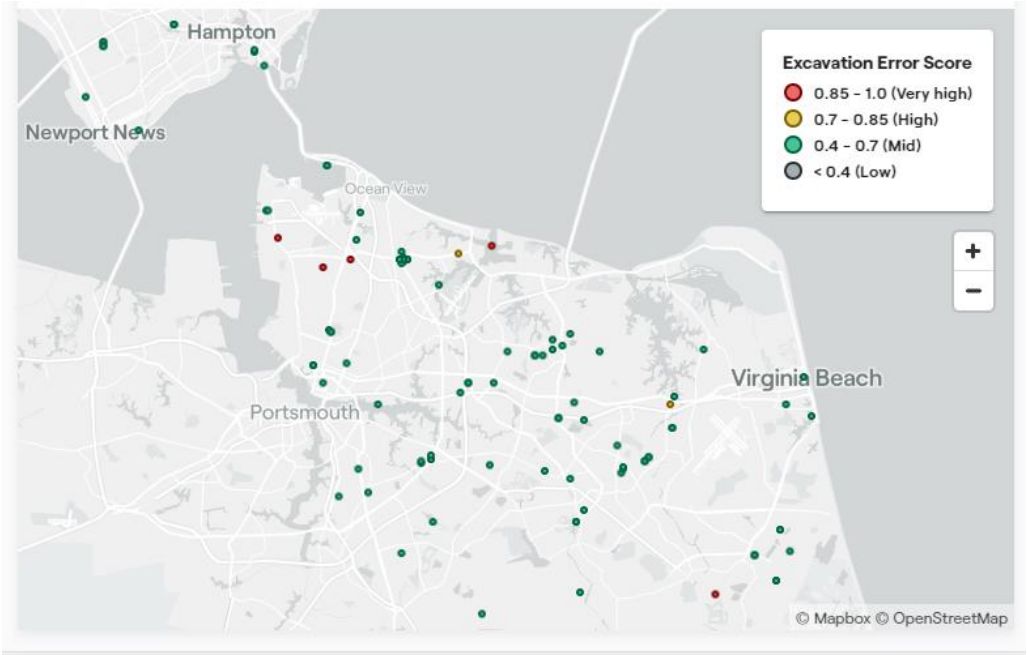
W&P Type

- Select all
- Advanced W&P
- Asset Protection
- Intermediate W...

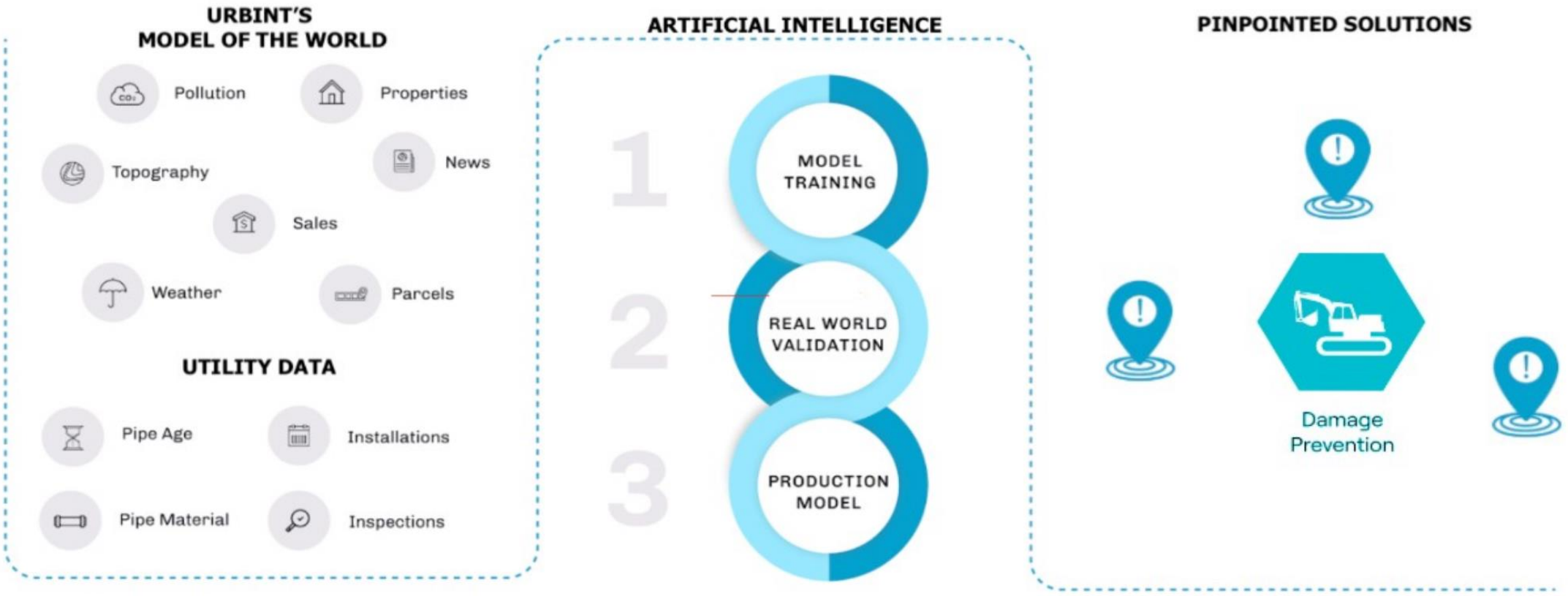
Job Title	# Interventions
Asset Protection Specialist	21172
GT	222
Crew Lead	196
FTB	172
FTC	116
FTA	22
FSA	12
FSB	10
Crew Lead Specialist	9
Total	**26530**

Total # Interventions by Impact & Threat



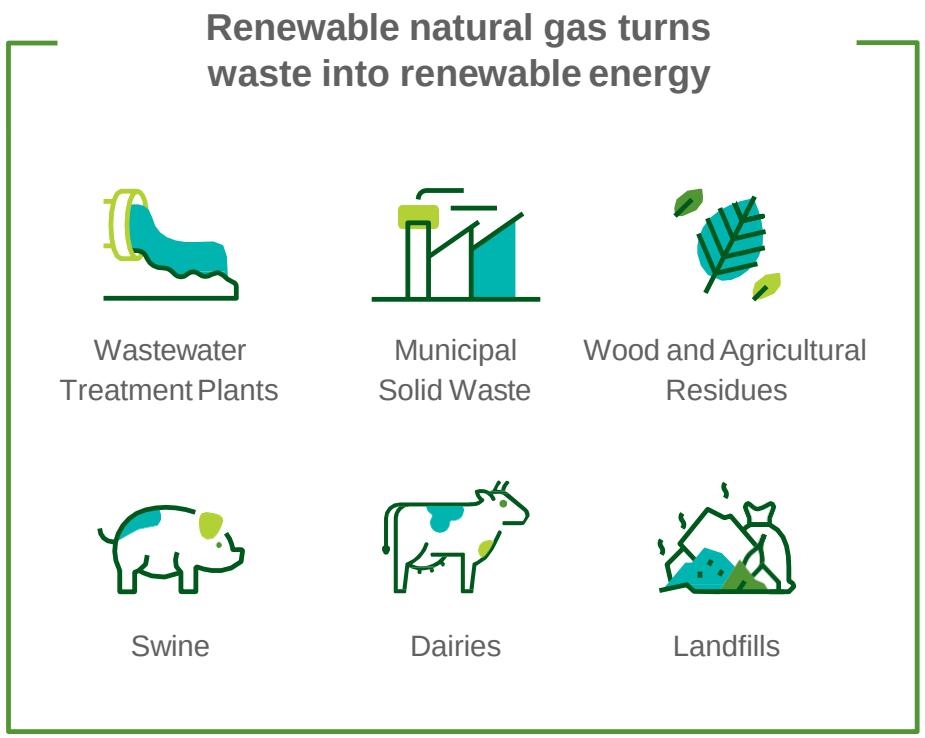


Predictive Analytics – How it Works



Renewable Gas

Renewable gas is a term used to describe both renewable natural gas (RNG) and hydrogen. Renewable gas is a critical component to our commitment to deliver clean, safe, reliable and affordable energy to our customers.



Community Benefit

- Economic development
- Local job creation
- New revenue streams

Customer Benefit

- Supply diversity
- Resiliency & reliability
- Avoided upstream transportation

Environmental Benefit

- Sustainable waste management
- Beneficial use of otherwise waste methane
- Air quality benefits

Customer and Indirect Emissions

Opportunities for Economy Wide Solutions: Customer and Indirect Emissions

Residential and Commercial Customers

- High Efficiency Gas Technologies
- Energy Efficiency
- Renewable gas

Large Industrial Customers

- Renewable Gas
- Hydrogen “islands”
- CHP with RNG or hydrogen
- CCUS

Sustainable Gas Supply

- Renewable gas – RNG and potential for hydrogen
- Next Generation Natural Gas upstream gas supply – differentiated, lower emissions geologic natural gas

The Value of Hydrogen

Hydrogen has the potential to play a critical role in reaching a clean energy future. Capable of serving key sectors such as transportation, heating, electric generation and industrial production, hydrogen can be stored and used without greenhouse gas emissions and can be produced from a range of low-to-zero carbon sources.

Investing in Energy Efficiency

$224M+
in incentives since 2011

200M+
first year therms saved since 2011

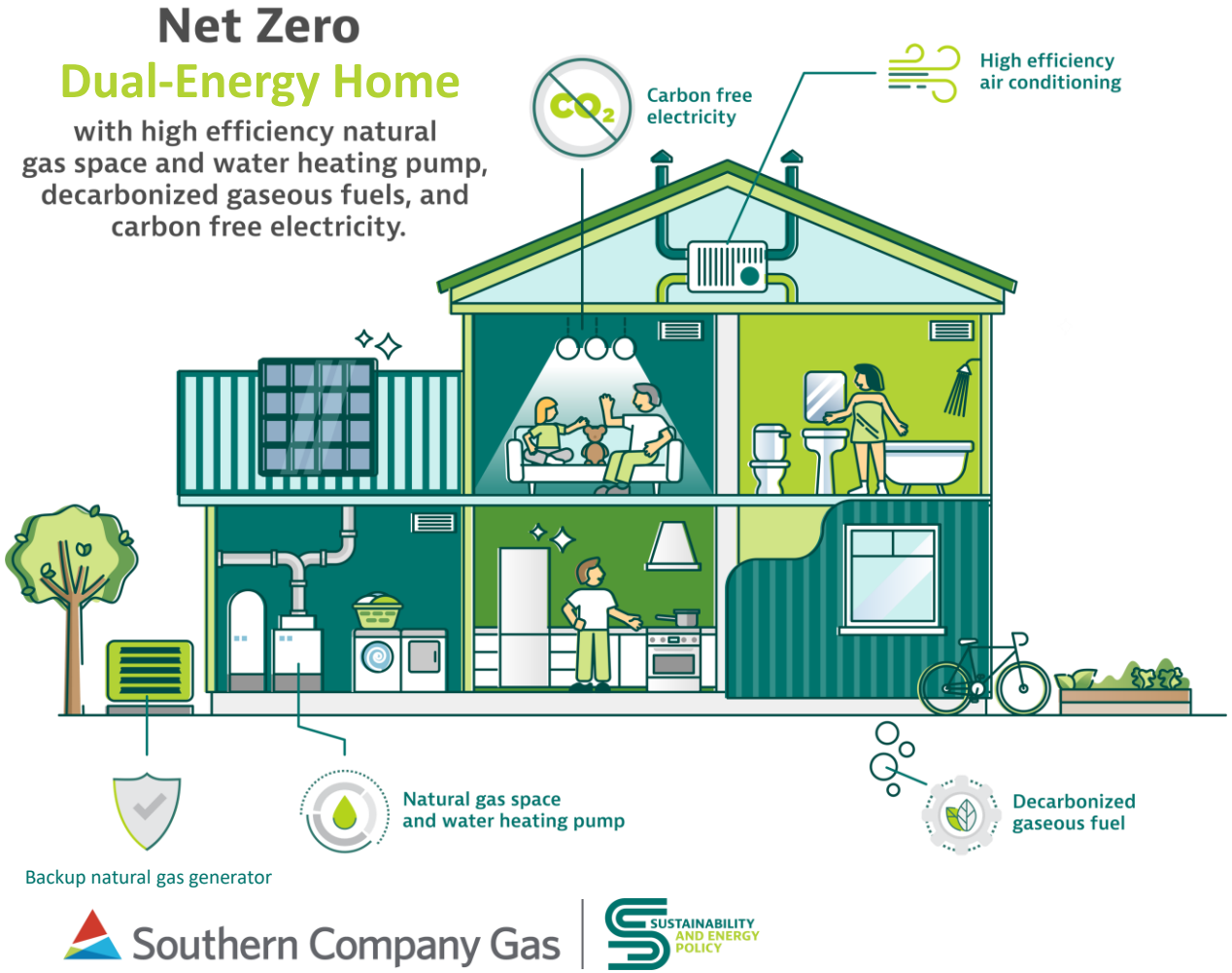
$1.68B
Economic activity spurred since 2011

1.18M+
customers in 643 communities have participated

Breakthroughs in EE Technology

- Thermally-driven gas heat pumps
- Smart valves
- Skinny R30 wall retrofits
- Thin triple pane windows
- Whole home sealing

Natural gas utility solutions for customers in a net zero energy future



Southern Company Gas | SUSTAINABILITY AND ENERGY POLICY

A portfolio approach to energy integrating renewable gas, energy efficiency, and next generation gas appliances

- ↗ **Preserves affordability**
- ↗ **Accelerates GHG emissions reductions**
- ↗ **Preserves a resilient energy system**
- ↗ **Offers customer choice and value**
- ↗ **Supports energy diversity and security**

Benefits of Natural Gas

Natural Gas and its Infrastructure

Drive Emissions Reductions

Serve as a Foundational Fuel

Fuel Economies

Empower Energy Equity

Ensure Comfort and Choice

Natural gas is a ~~bridge~~ foundational fuel.

The most practical, realistic way to achieve a sustainable future where energy is clean, safe, reliable and affordable, is to ensure it includes natural gas and the infrastructure that supports it.