

# **Con Edison and Orange & Rockland Pre-Technical Conference**

**April 26, 2023**

# Agenda

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- **Natural Gas 101** – Concentric Energy Advisors
- **Company Overview** – Christine Cummings (CE), Jacqueline Frosco (O&R)
- **Customers Demographics, Usage Trends and Demand Forecasting** – John Catuogno
- **Decarbonization Efforts** – Michael Sanchick (CE), Jon Hilowitz (O&R)
- **Gas Supply Procurement, Transportation, and Storage** – Kate Trischitta
- **Distribution System Engineering and Operation** – Tony Mancino (CE), Nick Hellen (CE), Flannan Hehir (O&R)
- **Utility Emissions** – William Slade
- **Gas Long Range Plan Overview** – Shuchita Prakash

## Meeting logistics (Agenda, Q&A, etc.)



Consolidated Edison Corporation, Inc. (Con Edison) and Orange & Rockland Utilities, Inc. (O&R) (together, the Companies) are hosting this Information Session to share background information regarding the natural gas system in general and the Con Edison and O&R systems specifically. The aim of this evening's program is to enable stakeholders' effective participation in the gas system long-term planning process.

Q&A will follow each presentation to address matters related to the material presented.

*Please use the "raise hand" feature of the meeting platform so that we know when there are questions to address. (We will answer questions in the order they are received.)*



# NATURAL GAS INDUSTRY OVERVIEW

Mark Cattrell & Melissa Bartos



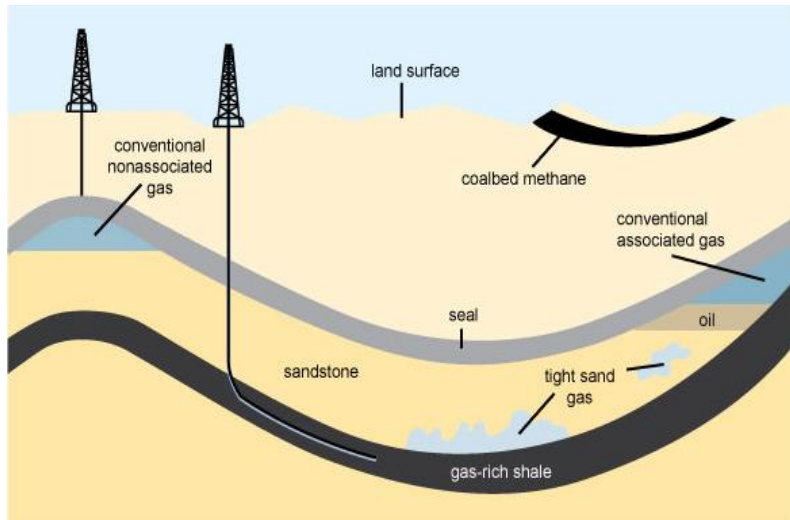
Concentric Energy Advisors, Inc.

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# What is Natural Gas?

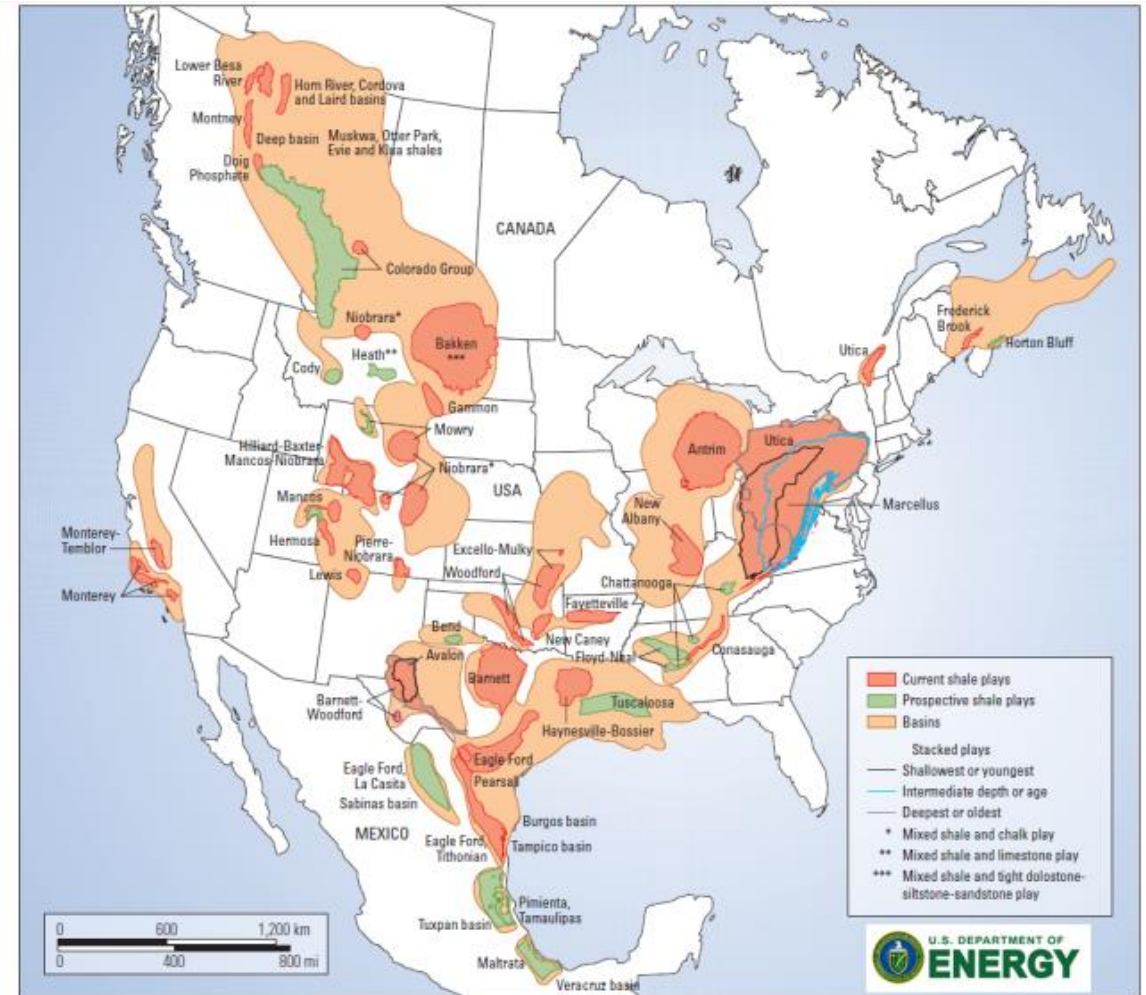
## Where Does it Come From?

Natural Gas Resource Pools



Source: <https://www.eia.gov/energyexplained/natural-gas/>

North American Natural Gas Production



# Natural Gas: Units of Measure

- **BTU** (British thermal unit) measures the *heat value* of natural gas. One BTU is the amount of heat energy required to raise one pound of water by 1°F.
- **CCF** (one hundred cubic feet) measures the *quantity* or volume of gas.
- Gas utilities typically bill customer usage by either “therms” (*heat value*) or by cubic feet (*volume*).
  - 1 natural gas “therm” = 100,000 Btu
  - “MCF” and “CCF” are both common volume units. 1 MCF = 10 CCF



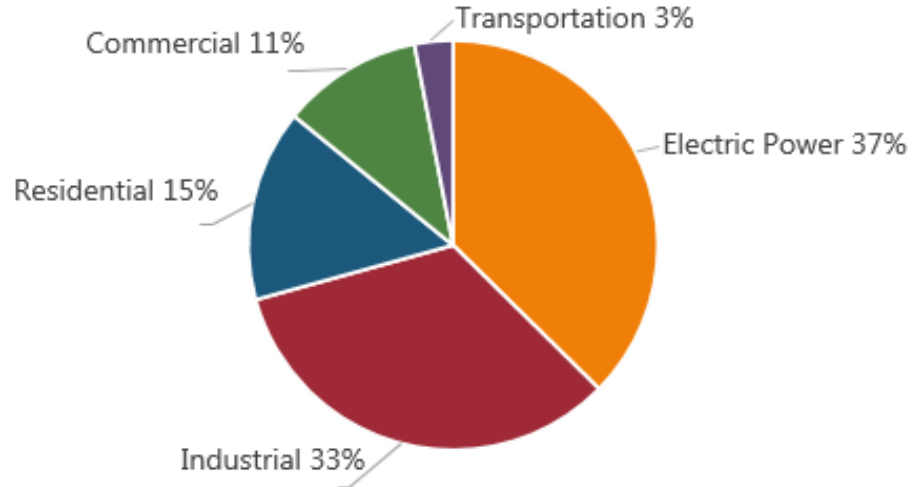
1 CF	=	0.01 CCF	=	0.01 MCF	≡	1,000 Btu	=	0.001 MMBtu	=	0.001 Dth	=	0.01 Th
100 CF	=	1 CCF	=	0.1 MCF	≡	100,000 Btu	=	0.1 MMBtu	=	0.1 Dth	=	1 Th
1,000 CF	=	10 CCF	=	1 MCF	≡	1,000,000 Btu	=	1 MMBtu	=	1 Dth	=	10 Th

Assumes BTU factor is 1 (i.e., 1,000 BTU/CF of natural gas). Actual BTU conversion (based on heat content of gas) varies by region by month.



# How is Natural Gas used?

- Electric power generation
  - Power plants
  - Distributed generation
  - Fuel cells, engines, and turbines
  - Secondary generators, typically used when primary power sources fail
- Industrial customers
  - Fuel for industrial processes
  - Feedstock for chemical processes and products
- Residential customers
  - Heating, cooking, air conditioning, etc.
- Commercial customers
  - Space heating, water heating, food preparation
- Transportation/Vehicle consumption
  - Compressed natural gas (CNG)
  - Liquefied natural gas (LNG)



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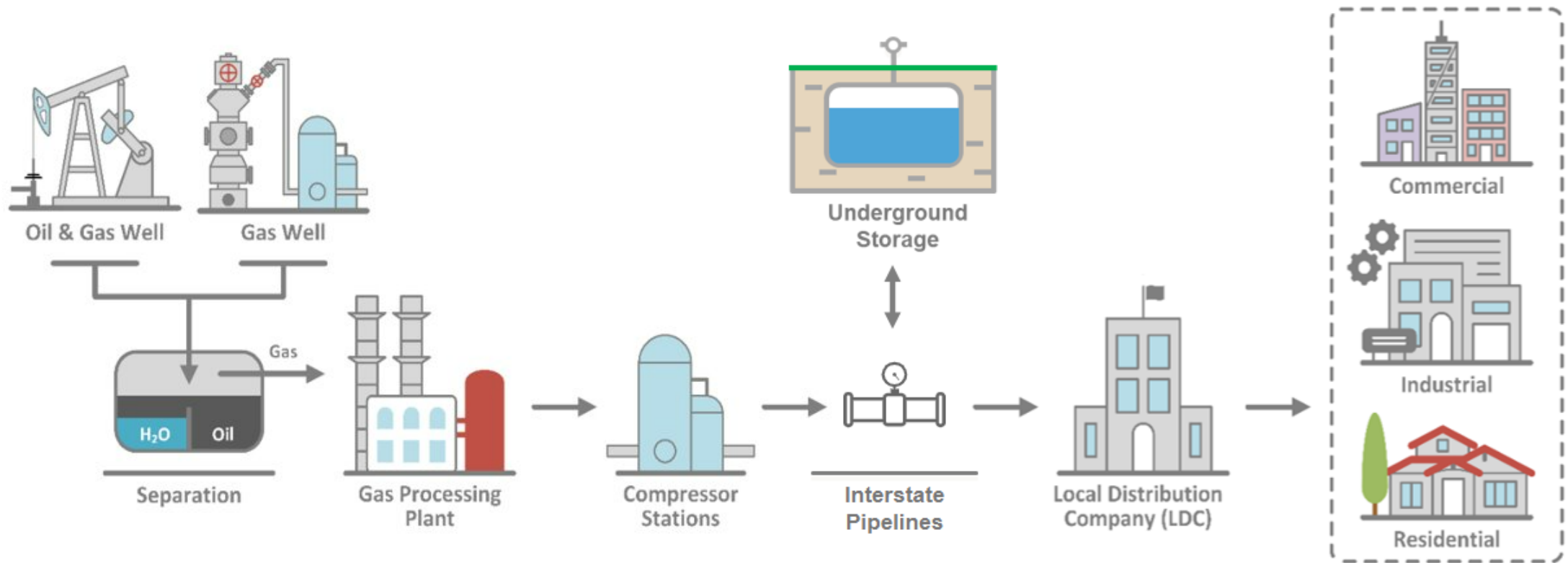
*The U.S. consumed ~30 trillion cubic feet (Tcf) of natural gas in 2021, which is roughly 32% of U.S. total energy consumption*

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Source: <https://www.eia.gov/energyexplained/natural-gas/use-of-natural-gas.php>



# The Natural Gas Value Chain



Source: Dept. of Energy, Concentric





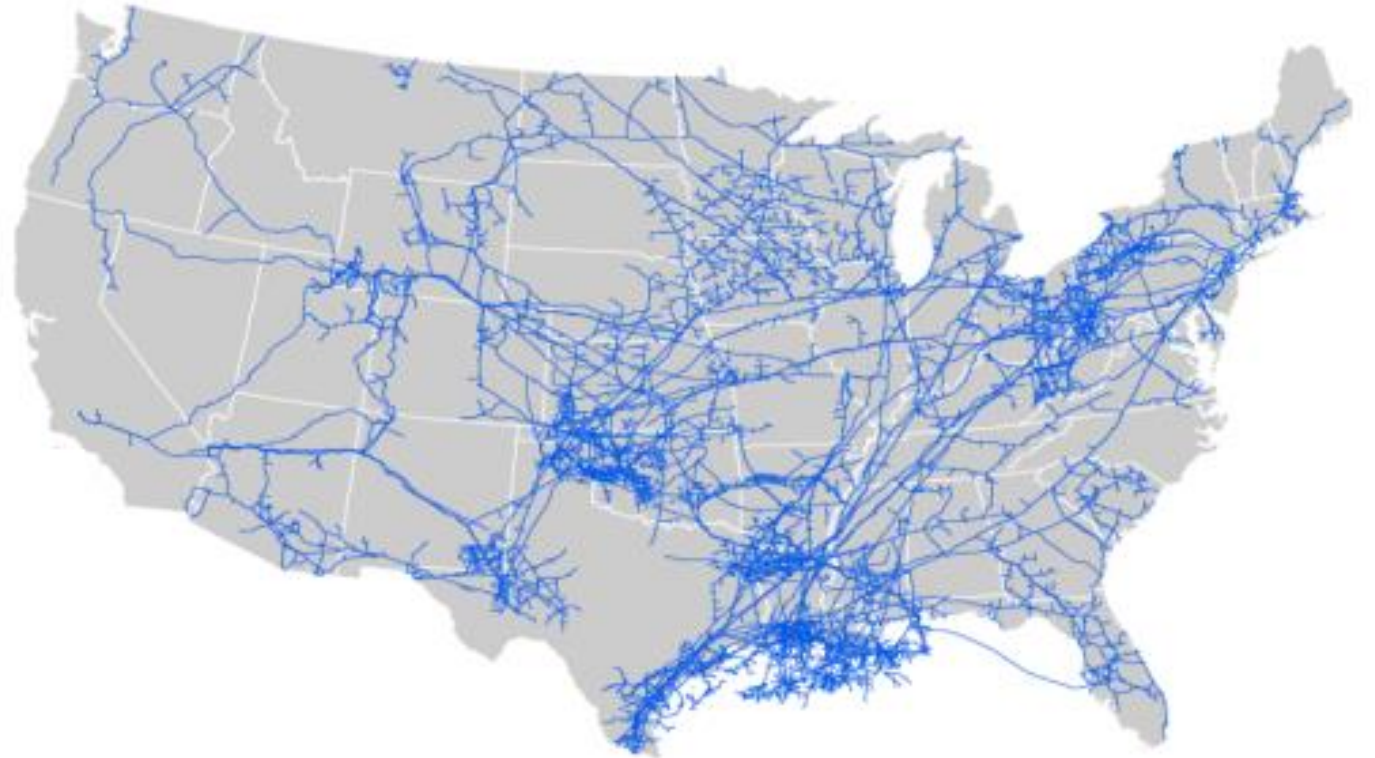
# How is Natural Gas Transported?

## U.S. Interstate Natural Gas Pipelines

The Interstate Natural Gas Pipeline System:

- The predominant mode of transportation for natural gas in the U.S
- Subject to safety regulation by the Dept. of Transportation, Pipelines and Hazardous Materials Safety Administration (PHMSA)
- Economic regulation by the Federal Energy Regulatory Commission (FERC)

Interstate pipelines are highly pressurized, with compression systems at various intervals to maintain pressure and flow



Source: Congressional Research Service



# How is Gas Stored?

## Above ground storage

- Some natural gas utilities use above ground storage facilities located on the distribution system

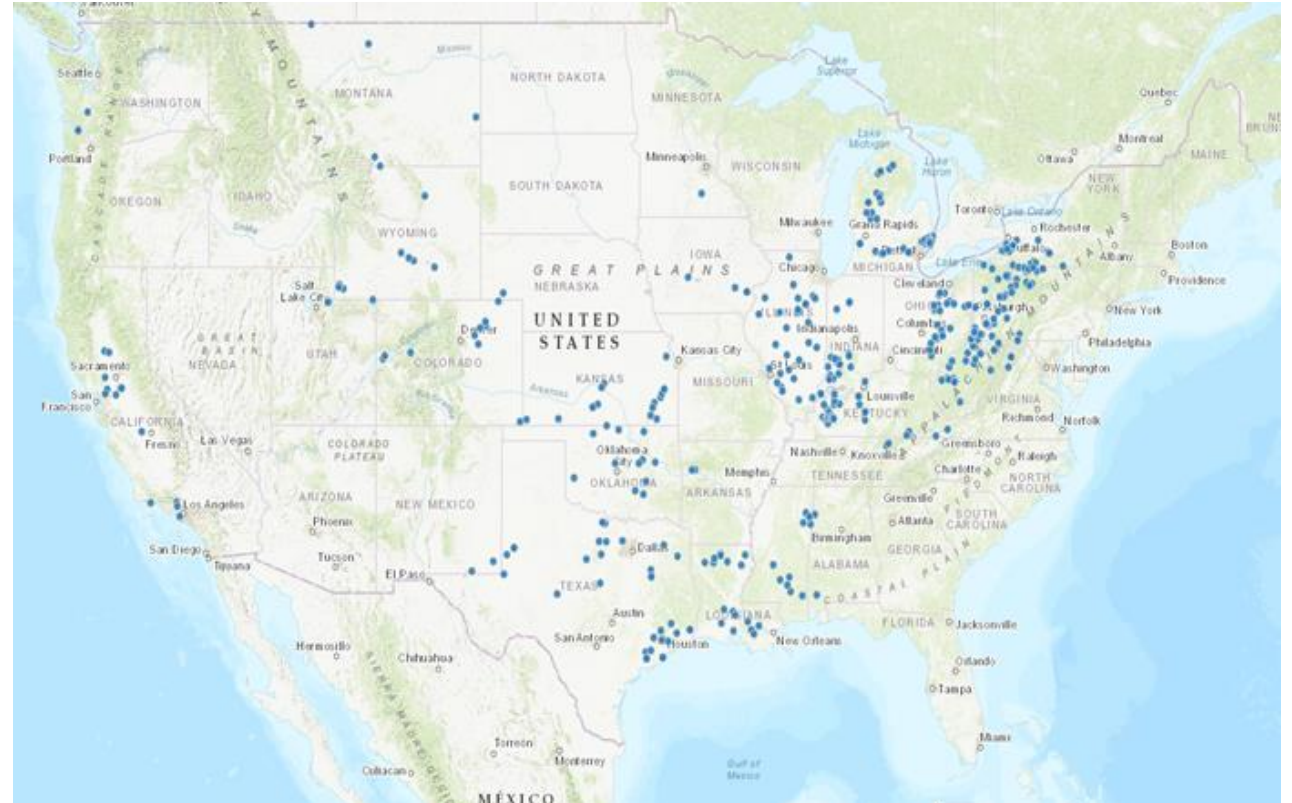
## Underground Natural Gas Storage Facilities

- Geologic storage facilities take the form of reused oil and gas wells

## Fundamental Storage Concepts

- Production area
- Market Area
  - Storage provides some protection from price volatility
  - Serves a reliability purpose as well

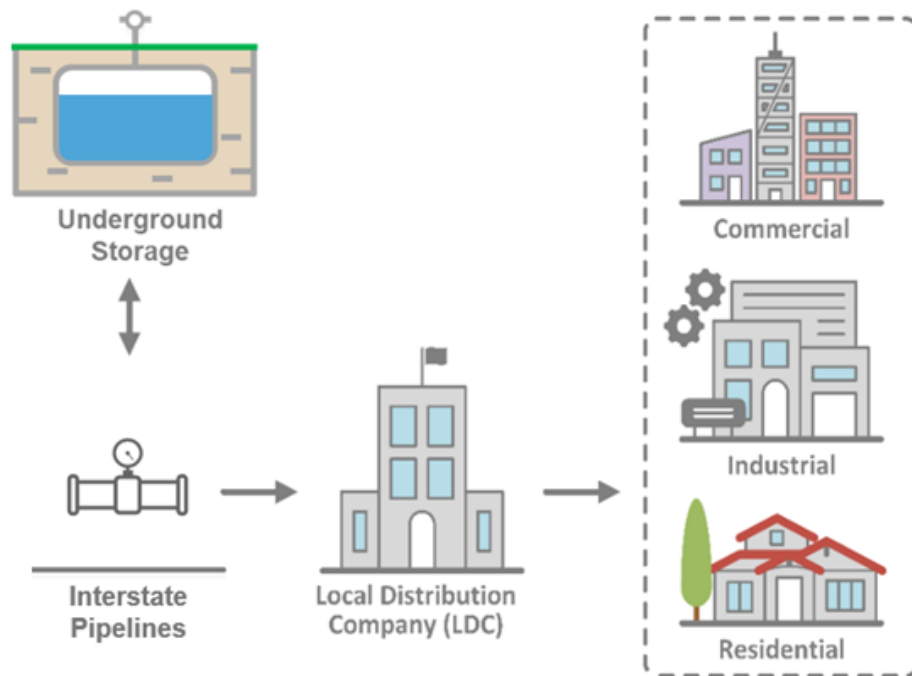
## Natural Gas Underground Storage



Sources: <https://atlas.eia.gov/datasets/natural-gas-underground-storage/explore?location=37.824831%2C-97.089969%2C5.00>



# How Does the Distribution System Operate?



Gas travels from the upstream interstate pipeline system to the “city gate,” the point where interstate and distribution pipelines connect

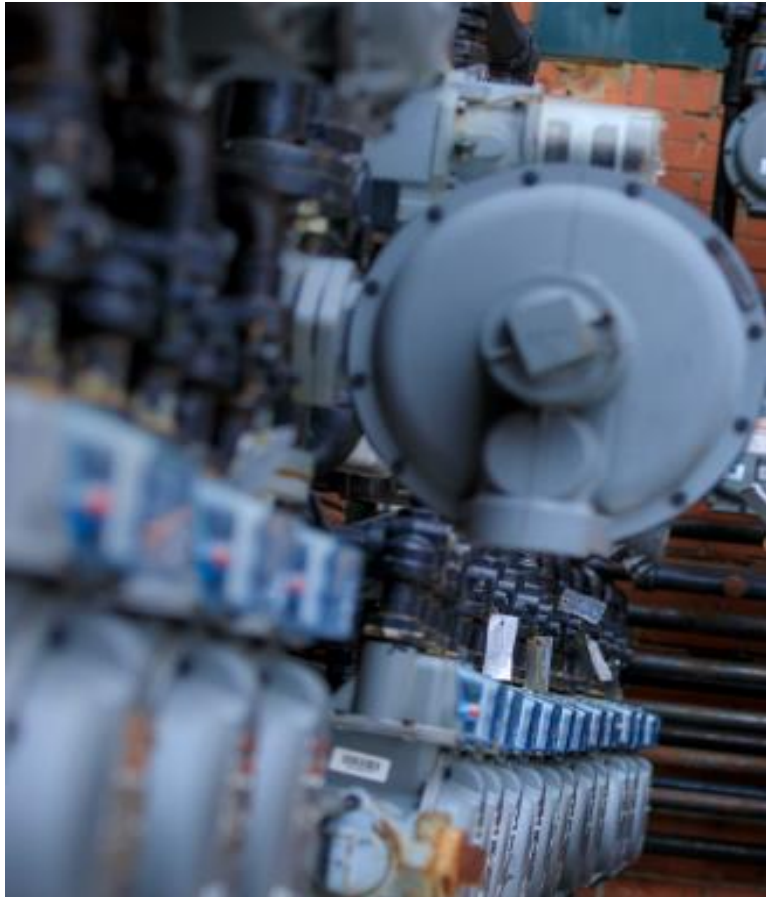
- Pressure is reduced
- Local odorant is applied to the gas (for safety)

Subsequent operational functions ensure distribution system reliability

- Distribution system design/construction
- Metering services
- Supply management



# Distribution Systems Involve a Complex Set of Infrastructure Components



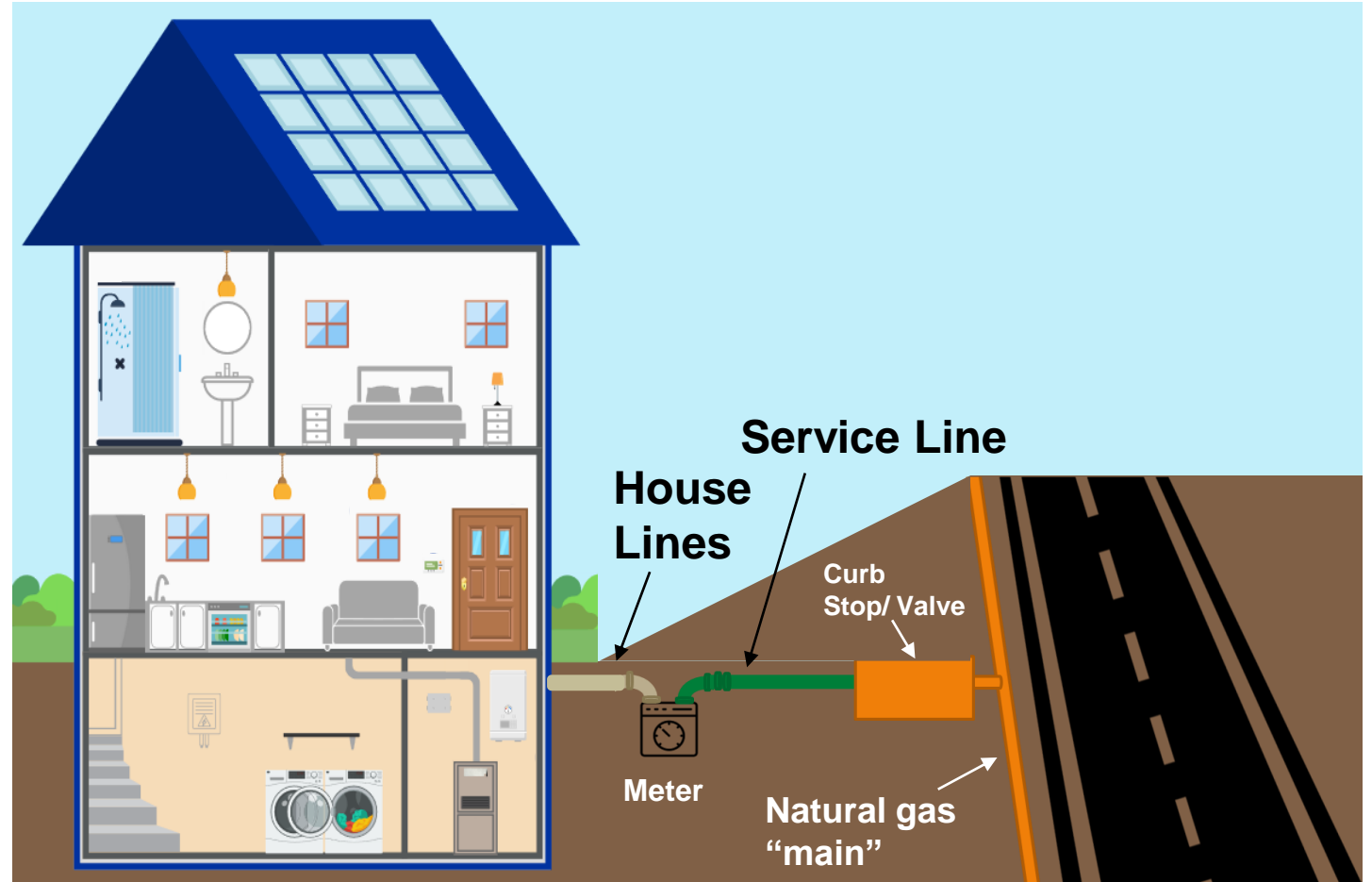
Natural gas travels from the city gate station to gas companies and finally, to end users

- Distribution lines are often referred to as “mains” and “services”
- Regulators control each distribution system, and maintain optimal gas pressure to ensure safe practices and enhance efficiency
- As gas travels closer to end-users, the “mains” connect to smaller pipes called “services”
  - Pipe diameter and gas pressure decrease as the distribution system gets closer to end-use customers



# Piped to Homes and Businesses through a Reliable, Underground Network

- Natural gas is transported to ~70 million homes and businesses
- Natural Gas service is not prone to weather events to the degree other infrastructure is
- As a result, delivery is *extremely* reliable (typically well above 99%)
- Underground network has safety advantage, with certain risks as well



Sources: (1) Dept. of Transportation, Pipeline & Hazardous Materials Safety Administration; (2) Interstate Natural Gas Association of America (INGAA)



# What are a Local Distribution Company's Key Accountabilities?



A local distribution company (LDC) owns and operates the infrastructure in the natural gas distribution supply chain

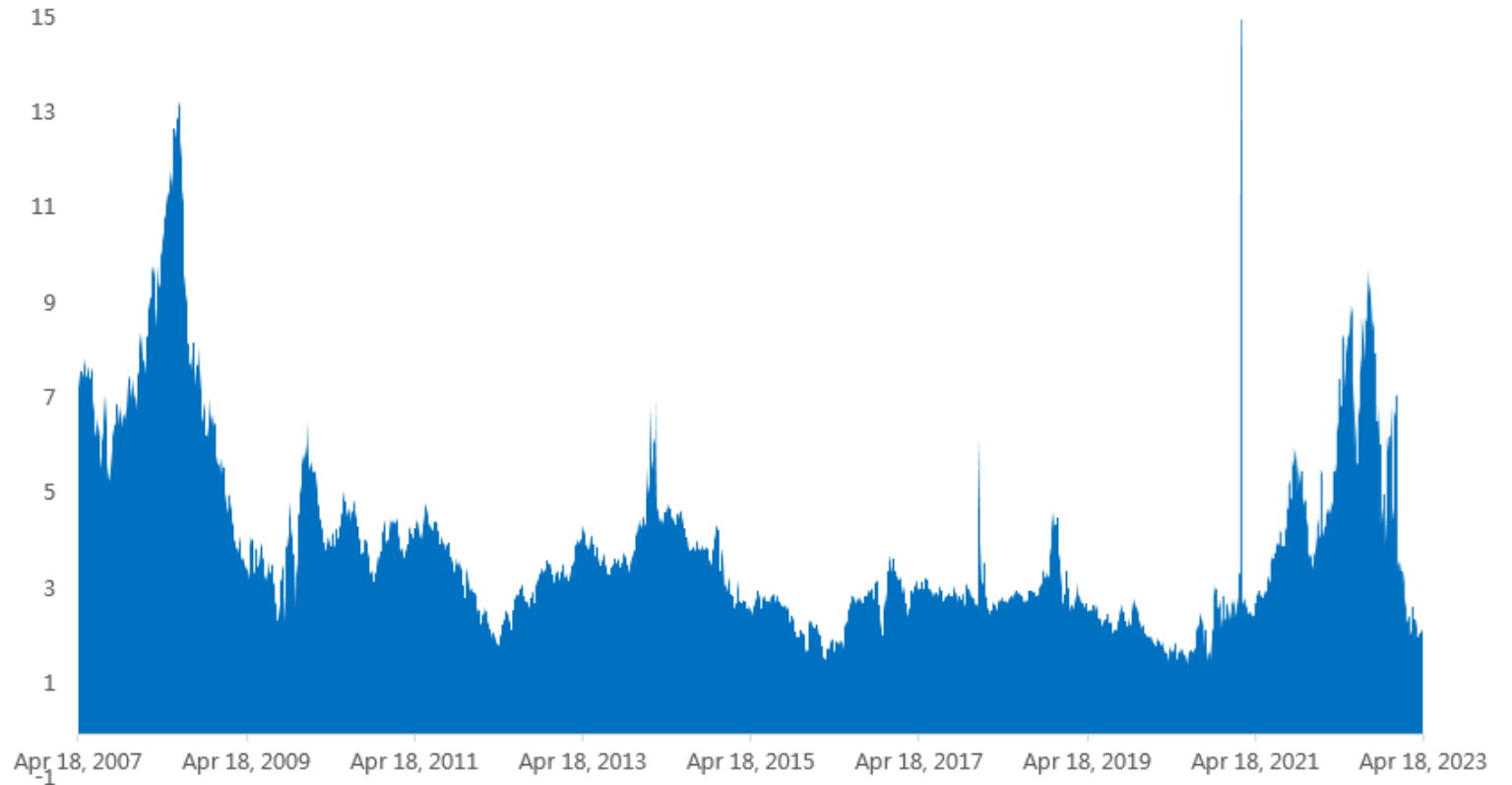
***Primary objectives:***

- Operate a safe, reliable, and resilient system at a reasonable cost
  - Safety oversight until end-use consumption
  - LDCs monitor gas flow rates and pressure gauges at checkpoints throughout system
  - Zero-tolerance for service interruptions
    - Regimented planning necessary to protect system reliability
- Other accountabilities include:
  - Forecasting gas demand to meet seasonal needs
  - Implement programs to manage and meet peak demands
    - Energy efficiency, demand response, peak-adjustment programs
  - Ensuring transportation capacity is sufficient to meet demand
  - Mitigate risk of price volatility to the degree reasonable



# Robust LDC gas procurement practices can mitigate the effect of market volatility on customers

Henry Hub: Price History (\$/MMBtu), 2007-present



# Alternative forms of natural gas have use in certain scenarios



- **Liquefied** Natural Gas (LNG)
  - Natural Gas cooled to  $-260^{\circ}\text{F}$
  - Distribution-sited LNG facilities, in most cases with on-site pressurization
  
- **Compressed** Natural Gas (CNG)
  - Highly pressurized methane ( $\sim 3,000$  psig)
  - Compression shrinks the gaseous volume by a factor of approximately 100
  - The compressed state increases transportation efficiencies
  - For example, a flatbed CNG truck can transport several 20" diameter tubes containing gas





# Alternatives & Decarbonization

Alternatives to conventional natural gas

- Renewable Natural Gas (RNG)
  - Can serve as a drop-in (“like for like”) replacement for natural gas using existing infrastructure
  - Significant potential for near-term decarbonization
- Hydrogen (H<sub>2</sub>)
  - H<sub>2</sub> as a potential decarbonization tool has attracted significant research and development capital
  - The extent to which H<sub>2</sub> can replace or complement natural gas continues to be evaluated

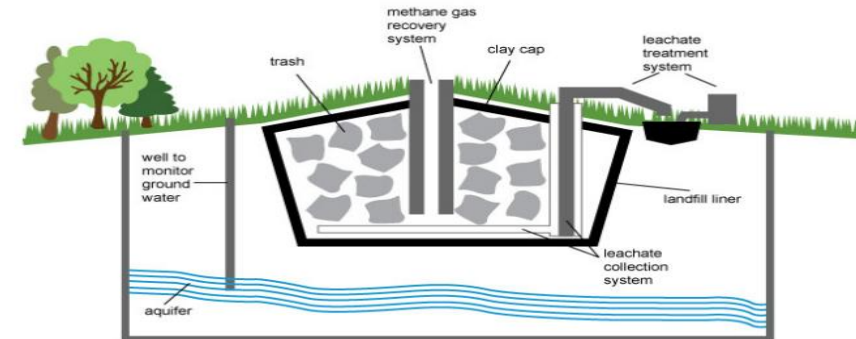
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*Alternatives have the potential to make material contributions to decarbonization.*

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## Renewable Natural Gas and hydrogen resources



- Source: <https://www.eia.gov/energyexplained/biomass/landfill-gas-and-biogas.php>



RNG Recovery,  
Compression,  
Transportation,  
Injection




# What are the components of a typical monthly gas utility bill?

1. Customer charge/meter charge/service charge
2. Distribution system usage charge
3. Upstream delivery service charges
4. Supply charges (“pass through” charges, subject to market price volatility)
5. Surcharges/special-purpose charges
6. Taxes and Fees

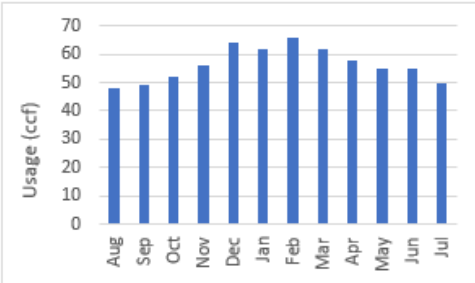
Account #: XYZ-1234-9876  
 Invoice #: 22-0701-L  
 Invoice Date: 08/06/2022  
 Service Dates: 07/03/2022 - 08/03/2022

**Public Service Company, Inc.**



<b>Total Amount Due by 09/06/2022:</b>	<b>\$134.97</b>
Amount Due after 09/06/2022:	\$139.02

<p><i>Service for:</i>                  Joseph Q. Traveler                  1234 Main Street                  Springfield, CA 90210</p> <p>Meter #: <b>8187961673</b>                  Days on Bill: <b>31</b>                  Usage: <b>50 ccf</b></p>	<p>Previous Balance: \$130.36                  Payment (07/30/2022): \$130.36                  Balance Forward: \$0.00</p>
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	Units	Rate	Charge
Customer Charge:			\$12.50
Usage Charge:	50 ccf	\$0.193940	\$9.70
Interstate Trans. Charge:	35 ccf	\$0.062300	\$2.18
Interstate Trans. Charge:	15 ccf	\$0.056000	\$0.84
Natural Gas C1	35 ccf	\$2.052300	\$71.83
Natural Gas C2	15 ccf	\$1.907840	\$28.62
Energy Assistance Charge			\$0.50
Energy Efficiency Prog. Charge			\$0.35
Other Surcharges			\$1.35
<b>Subtotal:</b>			<b>\$127.87</b>
Franchise Fee	3.00%		\$3.84
City Occupation Tax	0.80%		\$1.02
Sales Tax			\$2.25
<b>TOTAL:</b>			<b>\$134.97</b>

1

2

3

4

5

6



# How is the Natural Gas Industry Regulated?



**Safety regulations** at the federal, state, and local level apply to the entire natural gas value chain, from well-head to delivery service that reaches homes and businesses around the country



**Competition** is introduced where possible (e.g., customers are often able to shop among competitive natural gas commodity suppliers)



State and federal regulators apply **Economic regulation** when competition is not feasible.

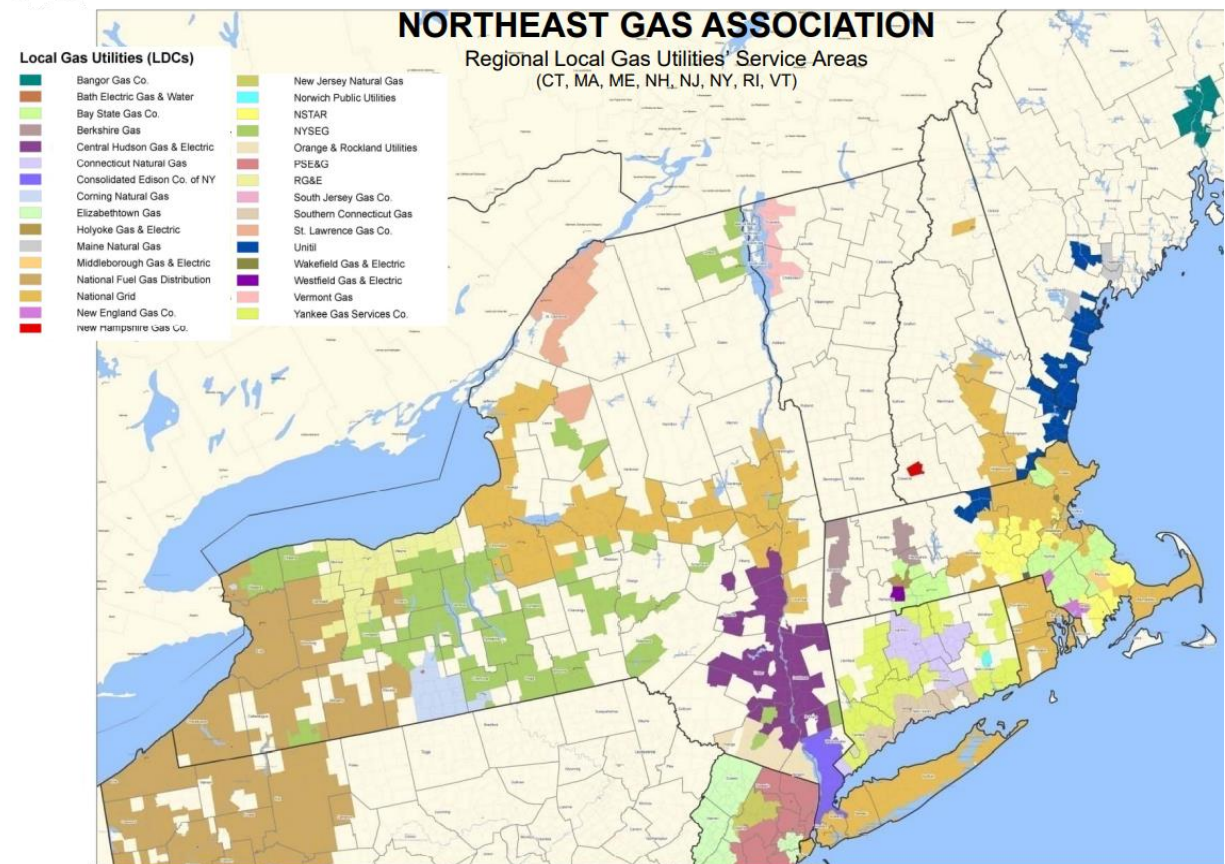
**Regulatory compact:** in exchange for providing safe and reliable service to all customers, a regulated utility has the opportunity to earn a just and reasonable rate of return on its capital investments.



# Overview of NY LDCs & Service Territories

Investor-Owned Utilities, Municipal Gas Utilities, and Utility Cooperatives

- Includes single-service and combined utilities, which provide gas and electric services
- For example, National Fuel Gas Distribution Corporation is a single-service LDC that provides natural gas



Source: Northeast Gas Association



Concentric Energy Advisors, Inc.

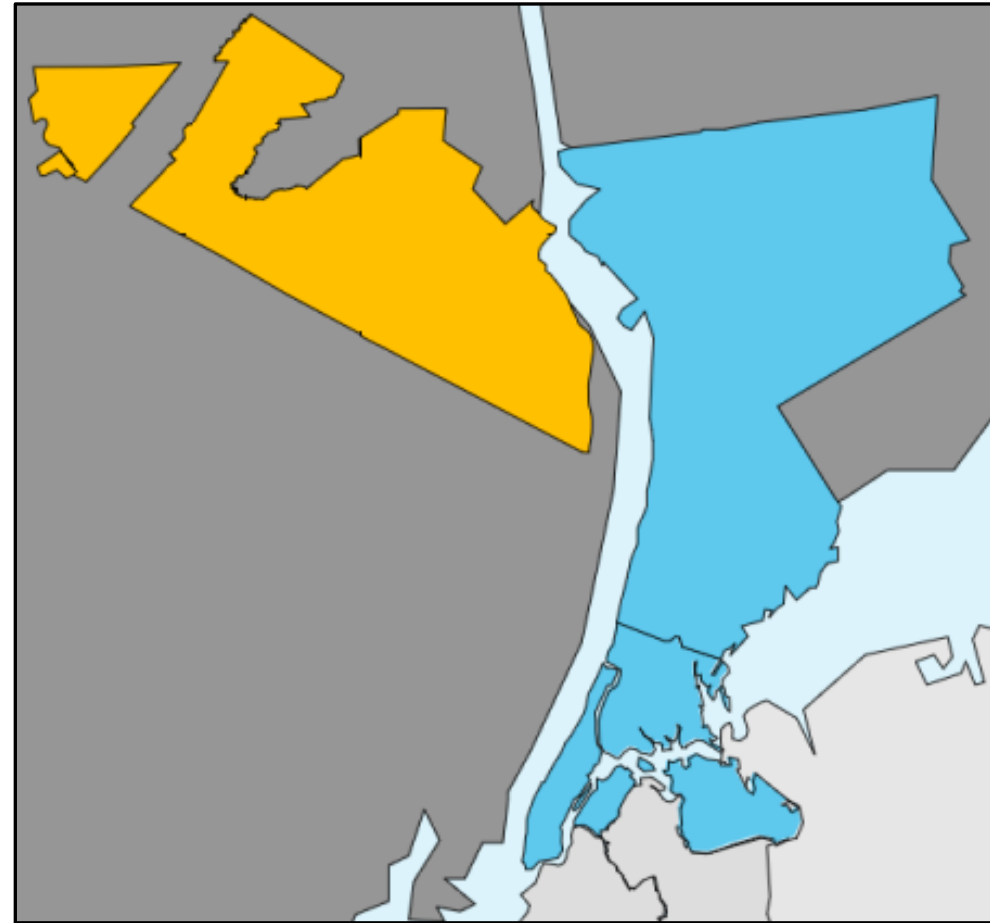


# Company Overview

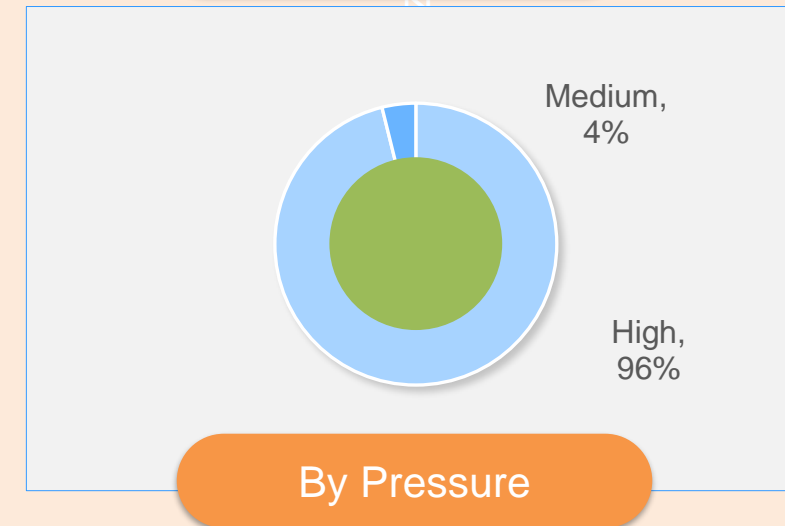
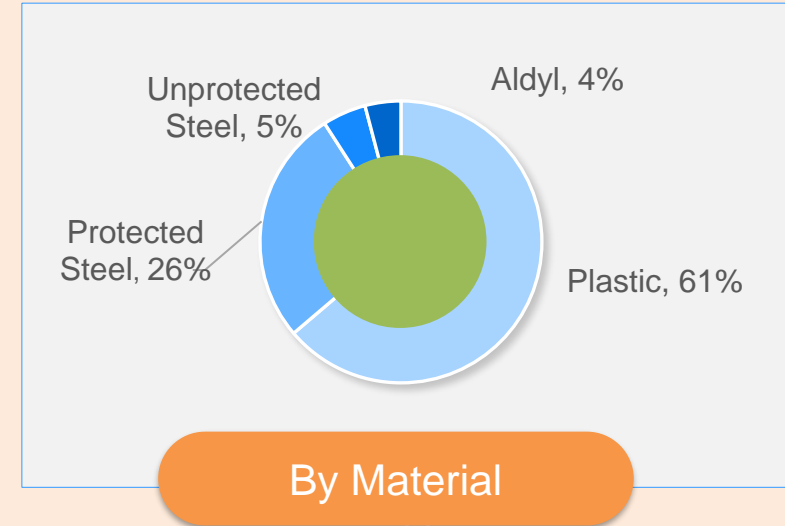
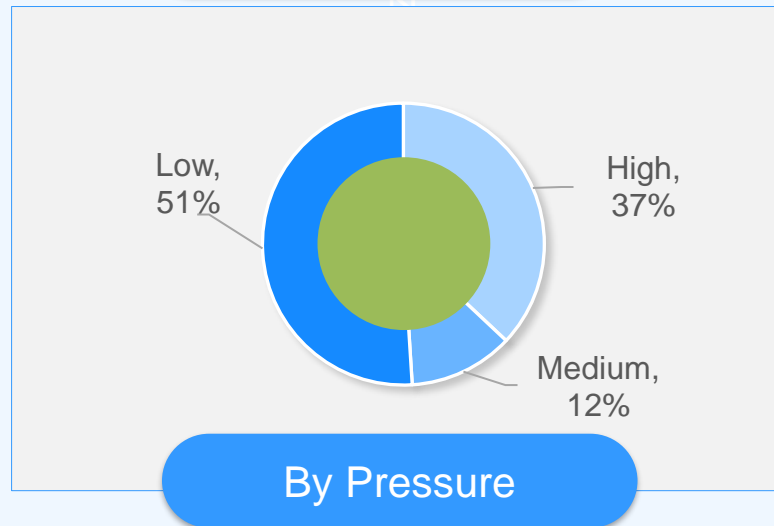
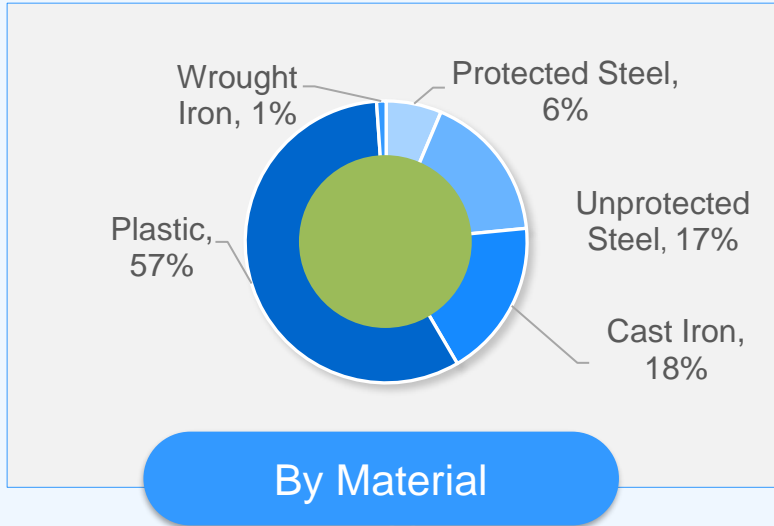
- Christine Cummings (CE), Jacqueline Frosco (O&R)

# Companies Gas System Overview

	CECONY	O&R
Customers	1.1 million	0.143 million
Services	378,000	106,843
Miles of Distribution Mains	Nearly 4,400	Nearly 1,880
Miles of Transmission Main	100	82



# Gas System Overview



# Customers Served

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- Small residential Customers
- 15,000+ restaurants in our service area
- Hotels
- Museums
- Stadiums/Sports Facilities
- Houses of Worship
- Laundromats
- End of life facilities
- Veterinary Clinics/Animal Hospitals
- K-12 schools
- Large residential customers
- Hospitals
- Rehabilitation Centers
- Universities
- Biomedical research
- Fire Houses/Emergency Operations Agencies
- Commercial/Manufacturing companies
- Supermarkets/bodegas
- Parks and other recreational facilities
- Electric and steam generators



# Key Priorities

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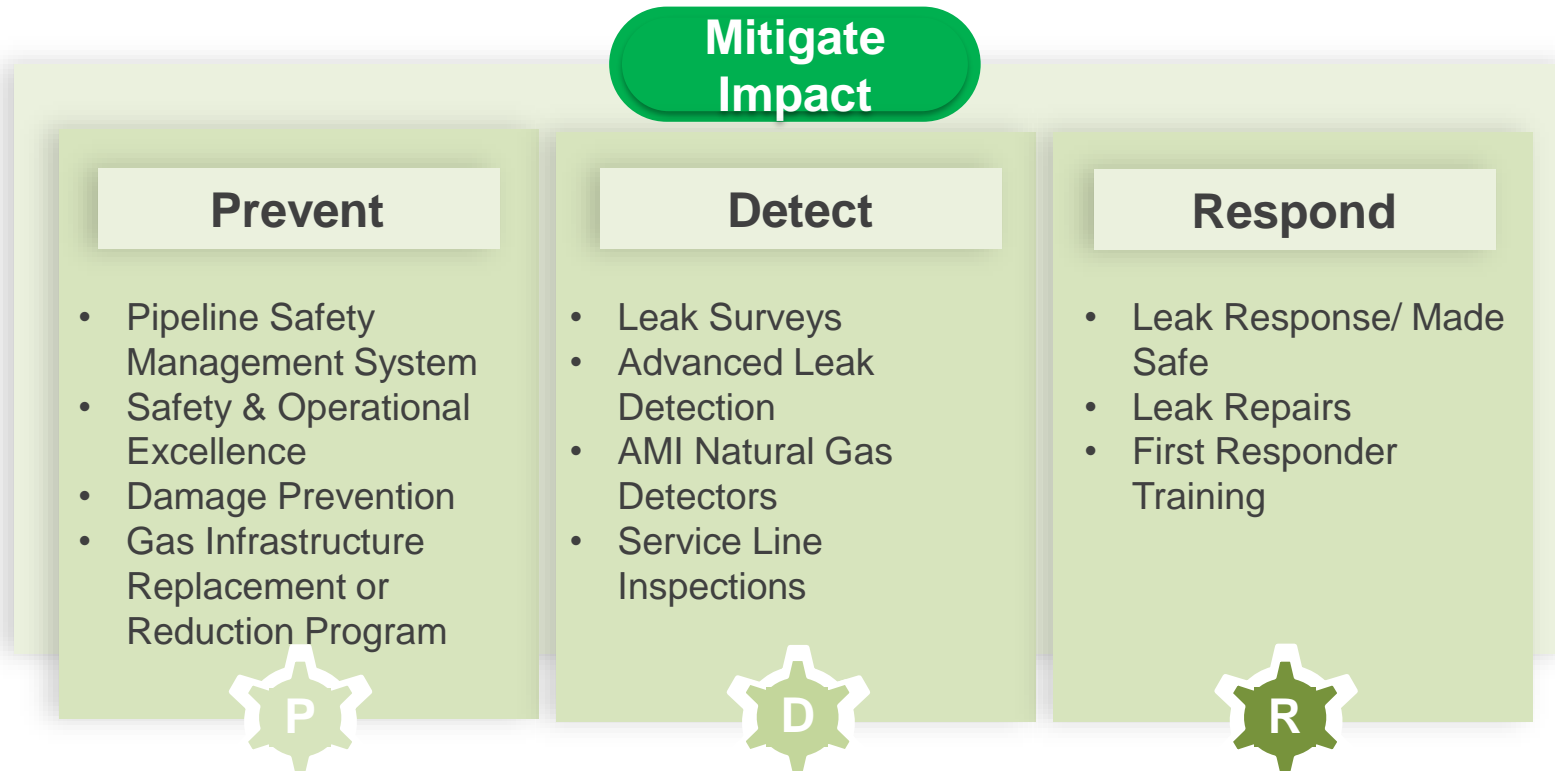


We will be an **agile, diverse and united** team committed to meeting the challenges we face today and embracing the opportunities of tomorrow.

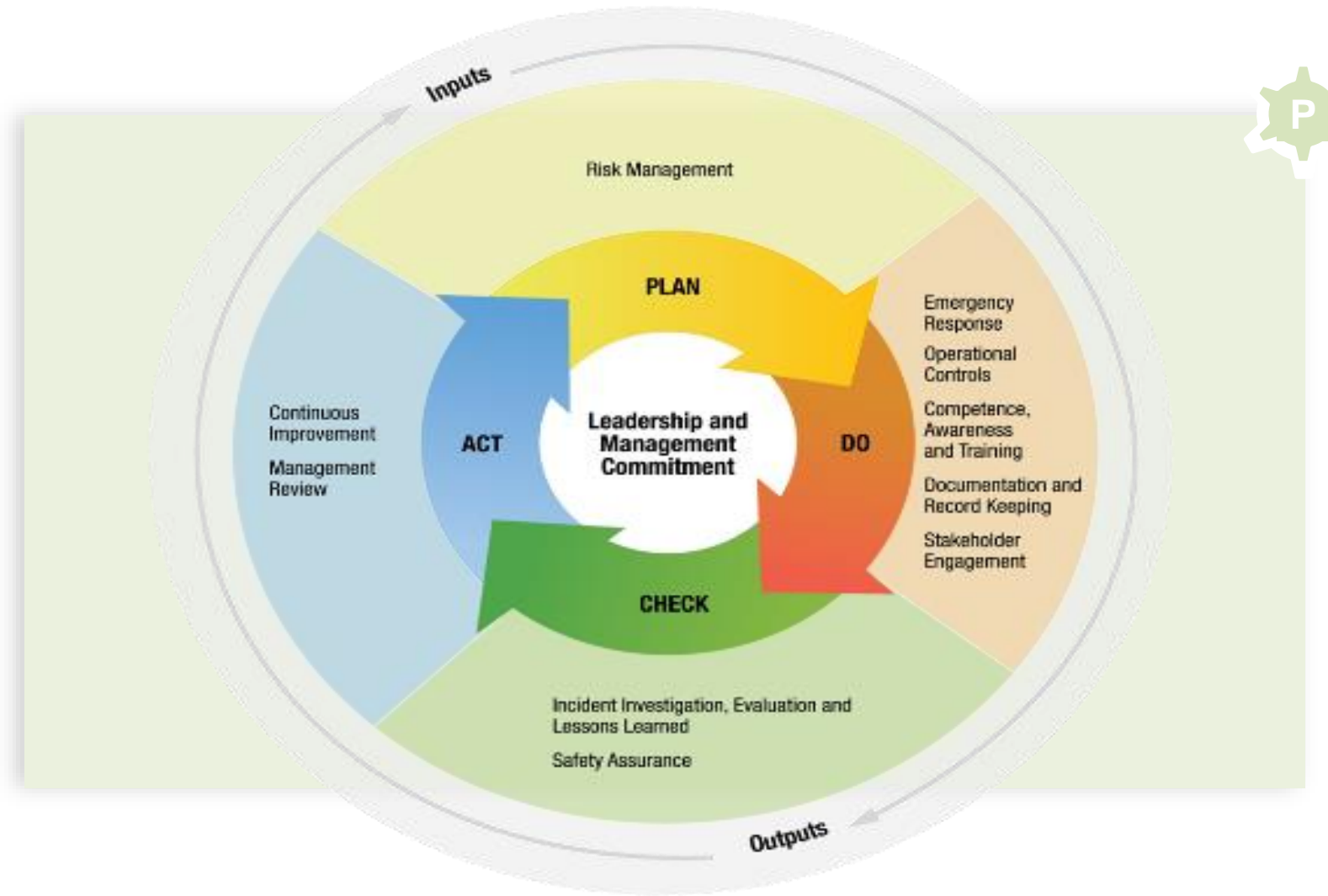
We will:

- Relentlessly **focus on safety**
- Deliver energy meeting the **highest standards** of excellence in the industry
- **Drive the clean energy future** while never losing sight of our core obligations
- Always plan and act in the **best interest of our employees, customers, and the environment**

# Safety and Reliability Strategy

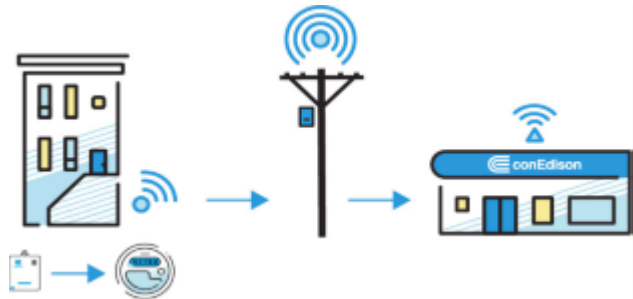


# Pipeline Safety Management System



# Emissions Avoidance – Customer Level

## AMI Enabled Natural Gas Detectors



### Implementation

- Mass deployment started in 2020
- Remaining units will be installed through 2025

### Implementation

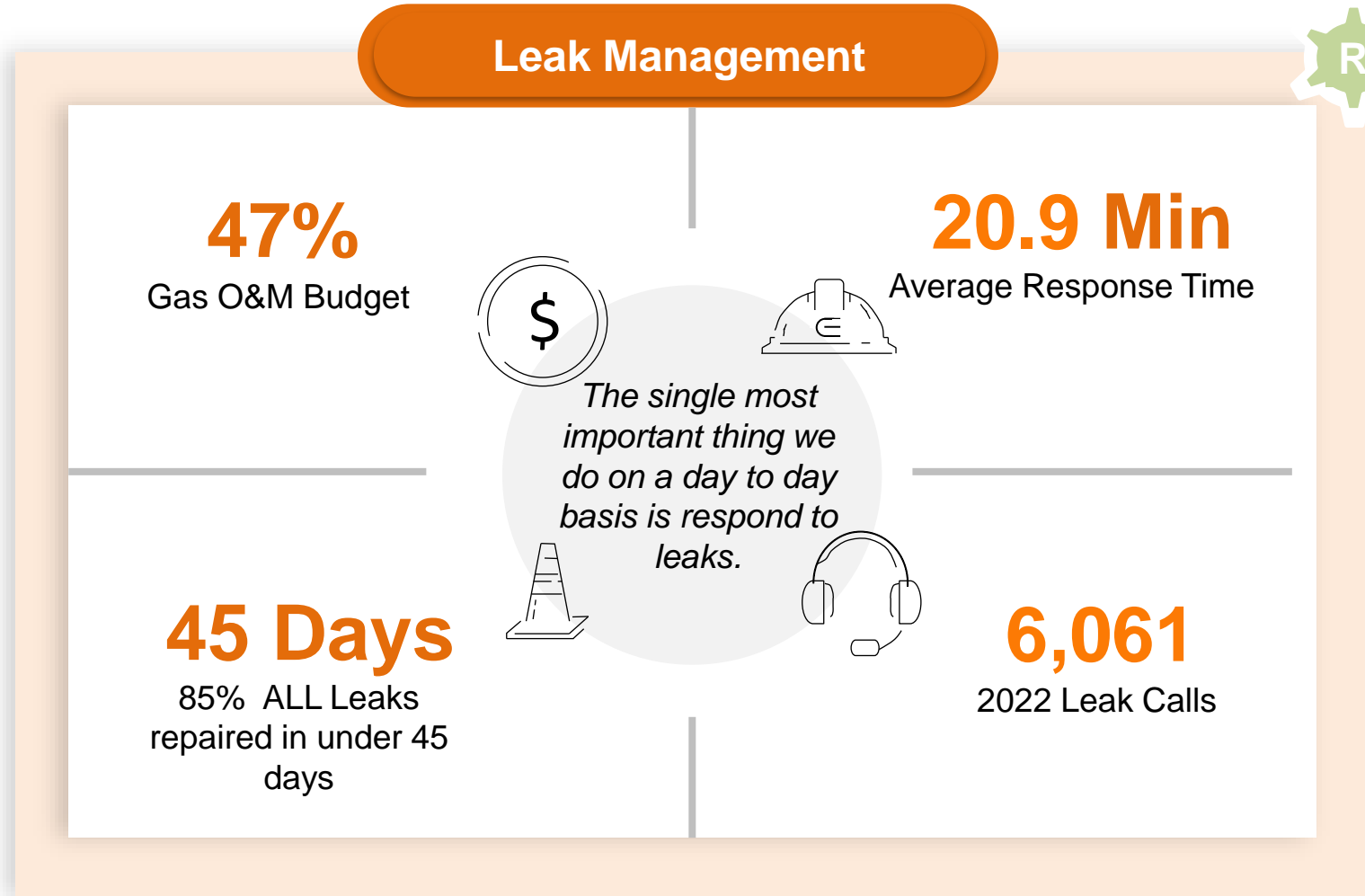
- Mass deployment started in 2022
- Remaining units will be installed through 2024

- Detect automatically & earlier
- Easy Installation
- Free for customers

# CECONY - Mitigations & Controls - Respond



# O&R - Mitigations & Controls – Respond





# **Customer Demographics, Usage Trends and Demand Forecasting**

- John Catuogno

# Who are our Customers in New York

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	CECONY	O&R
<b>Gas Customer Type</b>	<b># of Accounts</b>	<b># of Accounts</b>
Firm Residential	932,546	129,215
Firm Commercial	146,928	12,192
Interruptible (Non-Generator)	543	70
Electric and Steam Generators	6	1
<b>Total</b>	<b>1,080,023</b>	<b>141,478</b>



# DIVERSE TEAM OF ECONOMISTS, ENGINEERS, DATA SCIENTISTS, AND MATHEMATICIANS

## Commodity Forecasting

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- Forecasting influences critical decision making throughout the Companies
  - Drives **Planning and Capital Budget Spending**
  - Affects **Rate Case Revenue Requirement**
  - Affects **Operations and Reliability**
  - Informs **Analyses and Studies**
- Provides Electric, Gas, and Steam Forecasts
  - Peak (**Hour for Electric and Steam, Day for Gas**)
  - Volume (**GWh, MDt, and MMlb**)
  - Daily (**MW, MDt/day and Mlb**)

**Gas & Steam  
Forecasting**

**Forecasting Services**

**Electric Forecasting**

**Policy Integration  
Forecasting**

# FORECASTING PRODUCTS SPAN ALL AREAS OF THE COMPANIES

## CECONY and O&R Forecasting Deliverables

### Forecasting Services

#### *Short-Term System Forecasting* Next 24 Hours to 2 Weeks

- System Operation (Electric and Steam)
- Gas Control (Gas)
- Commodity Operations (Electric and Gas Supply)

#### Electric Forecasting, Gas & Steam Forecasting

#### *5-Year Volume & Revenue Forecasting* Yearly and for Rate Cases

- DPS Staff and NYISO
- Finance & Accounting
- Rate Engineering
- Commodity Operations (Electric and Gas Supply)
- Steam Services

### Forecasting Services

#### *Yearly Weather Adjusted Peak Analysis*

- Long-Term Peak Forecasting
- Customer Capacity Requirements (ICAP)
- NYISO

#### Electric Forecasting, Gas & Steam Forecasting

#### *Long-Term Peak Forecasting* Yearly for the System/Network/Gate Station

- |                         |                        |
|-------------------------|------------------------|
| • Engineering (All)     | • DPS Staff and NYISO  |
| • Transmission Planning | • REV/UoF              |
| • Business Finance      | • Commodity Operations |
| • Strategic Planning    | • Steam Services       |

## LOAD FORECAST UNCERTAINTY HAS INCREASED

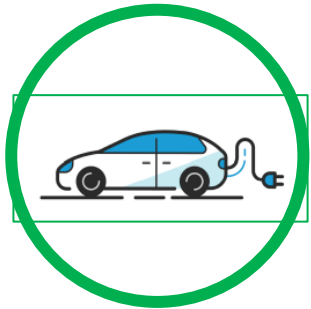
# Policy Integration Forecasting

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### Policy and Law

PIF was formed in June of 2021 to stay on pace with emerging policy initiatives that are driving the transition towards a renewable centered electric grid



### Load Modifier Forecasts

Develops Peak and Revenue & Volume load modifier forecasts for technologies such as Electric Vehicles, Heat Pumps, Batteries, and Photovoltaics



### Capital Projects

Provides leadership on Energy Management capital projects such as the REV/DER Forecast Tool and the AMI Analytics Program

# CECONY AND O&R PEAK AND VOLUME Design Criteria

	Firm Gas Peak Day		Annual Delivered Volume* (Firm and Interruptible Non-Generator)	
	CECONY	O&R	CECONY	O&R
<b>Model Type</b>	Deterministic	Deterministic	Deterministic	Deterministic
<b>Temperature Profile</b>	Winter 1933/1934	Winter 1933/1934	30 year normal per last rate case	10 year normal per last rate case
<b>Wind Speed</b>	10 mph	10 mph		
<b>Weather Station</b>	Central Park	Spring Valley	Central Park	Spring Valley
<b>Temperature Variable (Peak)</b> <b>Heating Degree Day (Volume)</b>	0°F TV [30% of prior Gas Day (10 AM – 10 AM) Average Dry Bulb Temperature + 70% of the current Gas Day Average Dry Bulb Temperature]	0°F TV [20% of prior Gas Day (10 AM – 10 AM) Average Dry Bulb Temperature + 80% of the current Gas Day Average Dry Bulb Temperature]	62 HDD	63 HDD
<b>Pressure Requirement</b>	Maintain pressure at or above 150 psig (inlet to distribution regulator stations)	Maintain pressure at or above 150 psig (inlet to distribution regulator stations)	N/A	N/A

\*Includes Revenue Decoupling Mechanism

# NEW YORK CITY

## Historical Weather

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- **Winter 1917/1918**

Date	Min Temp	Max Temp	GDA	TV
12/29/1917	-6	7	-4.2	1.9
12/30/1917	-13	1.9	-3.7	-3.8
12/31/1917	-7.1	6.1	1	-0.4

- **Winter 1933/1934**

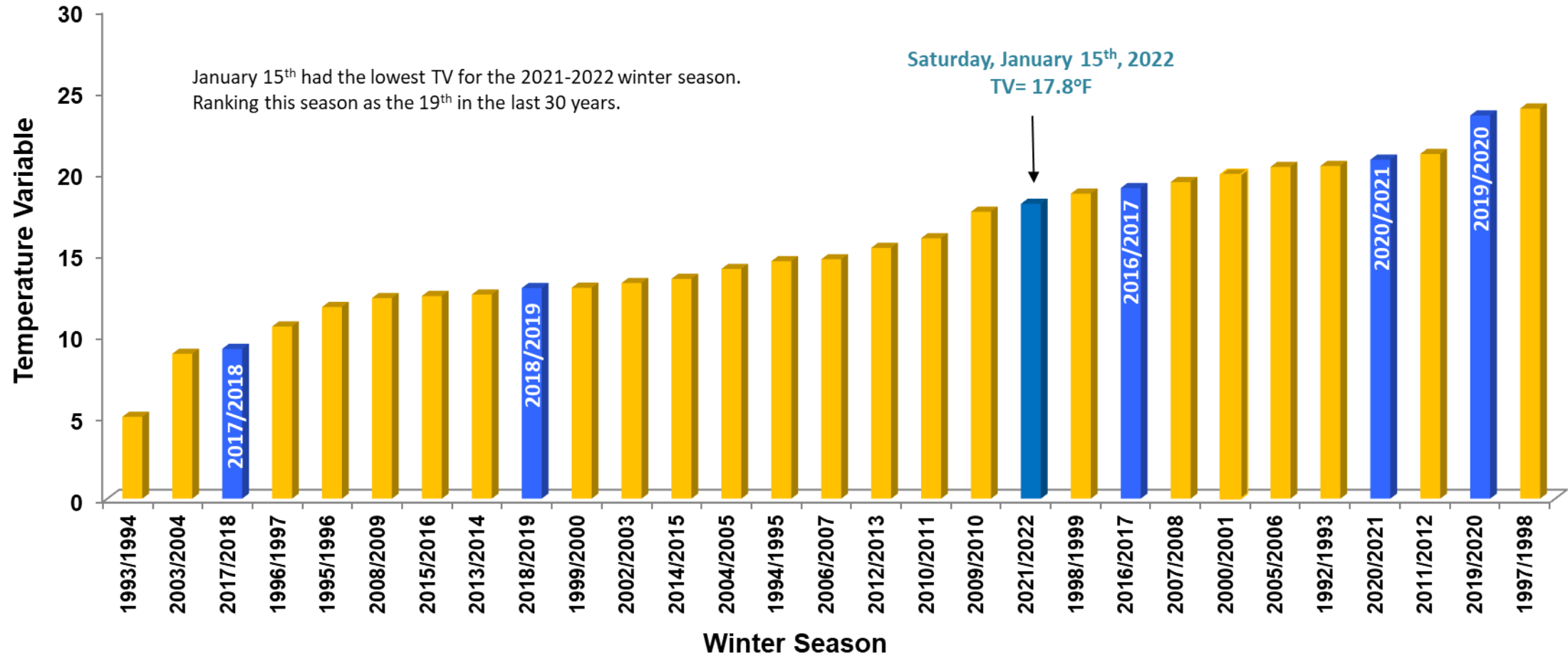
Date	Min Temp	Max Temp	GDA	TV
2/8/1934	-7.1	21	-1.8	4.9
2/9/1934	-15	8.1	1.8	0.7

- **Winter 1942/1943**

Date	Min Temp	Max Temp	GDA	TV
2/15/1943	-8	8.1	Hourly Data Not Available	Hourly Data Not Available

# CENTRAL PARK NATIONAL WEATHER STATION DATA

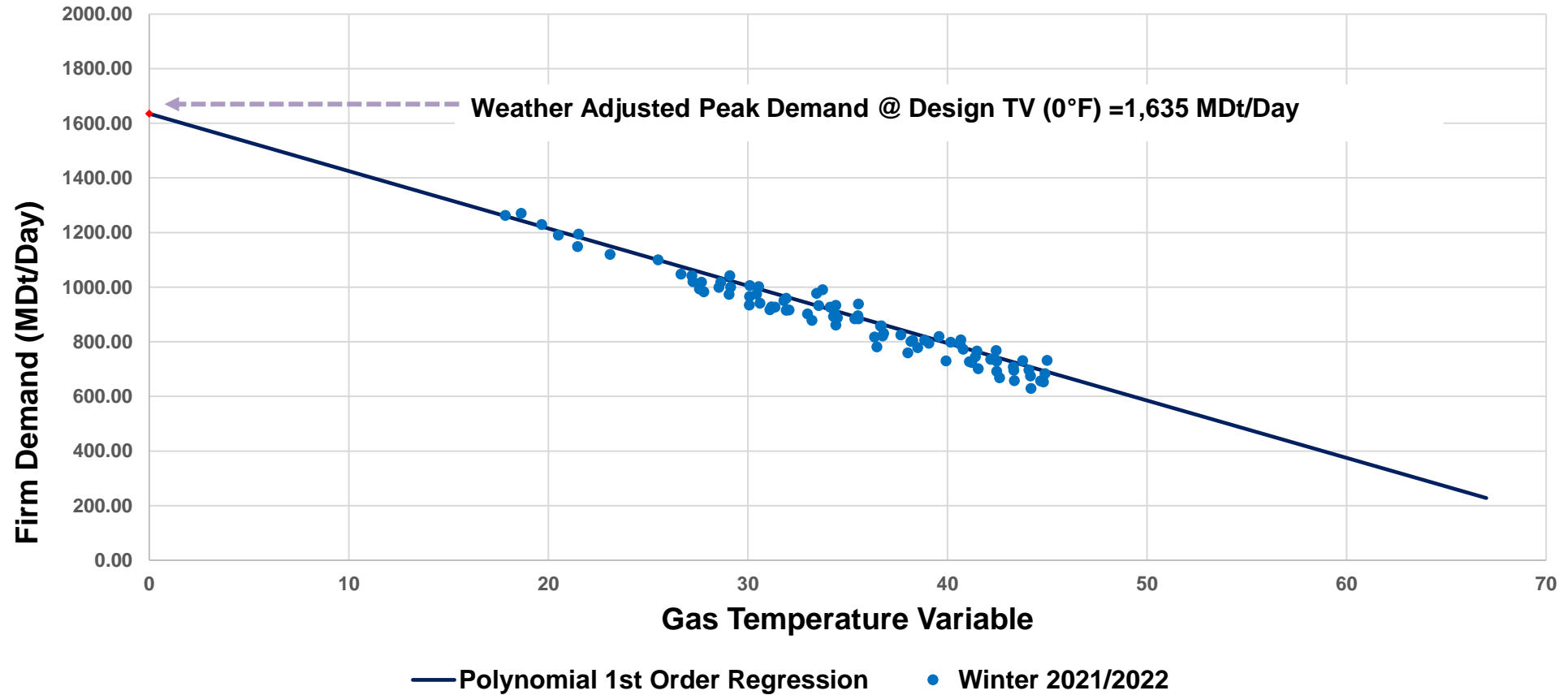
## Temperature Variable



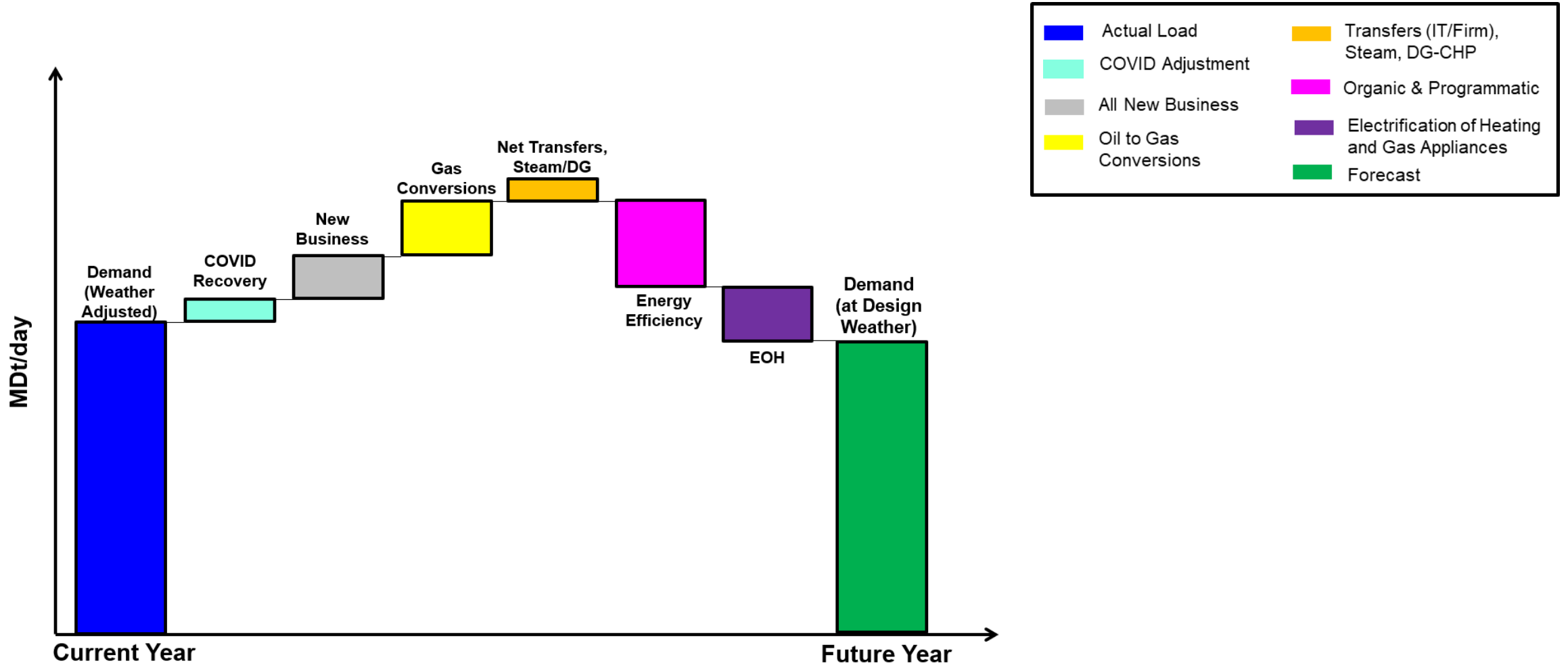
CECONY TV – 70% of current 24-hour Gas Daily Average Temperature + 30% of previous 24-hour Gas Daily Average Temperature (dry bulb only)  
 O&R TV – 80% of current 24-hour Gas Daily Average Temperature + 20% of previous 24-hour Gas Daily Average Temperature (dry bulb only)

# CECONY Gas - Weather Adjusted Peak (WAP)

CECONY Firm Gas Weather Adjusted Peak for Winter 2021/2022



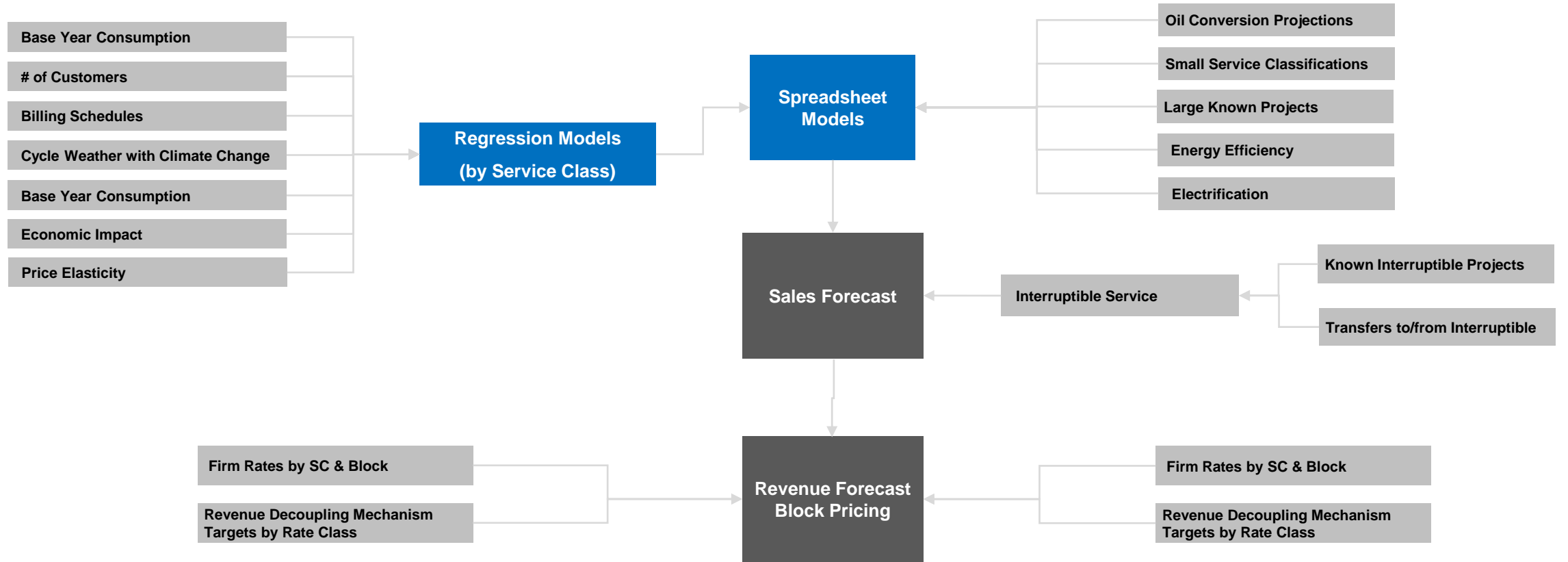
# Forecasting Methodology - Design Day





# CECONY AND O&R

## Forecasting Methodology – Revenue and Volume Delivered



### INTANGIBLE DRIVERS

Legislation / Regulation

Codes & Standards

Customer Behavior

- Forecast Modifiers
- Modelling & Analysis
- Forecast Output

**Note:**  
This overview is generalized. Forecast methodology and inputs may differ slightly between CECONY and O&R.



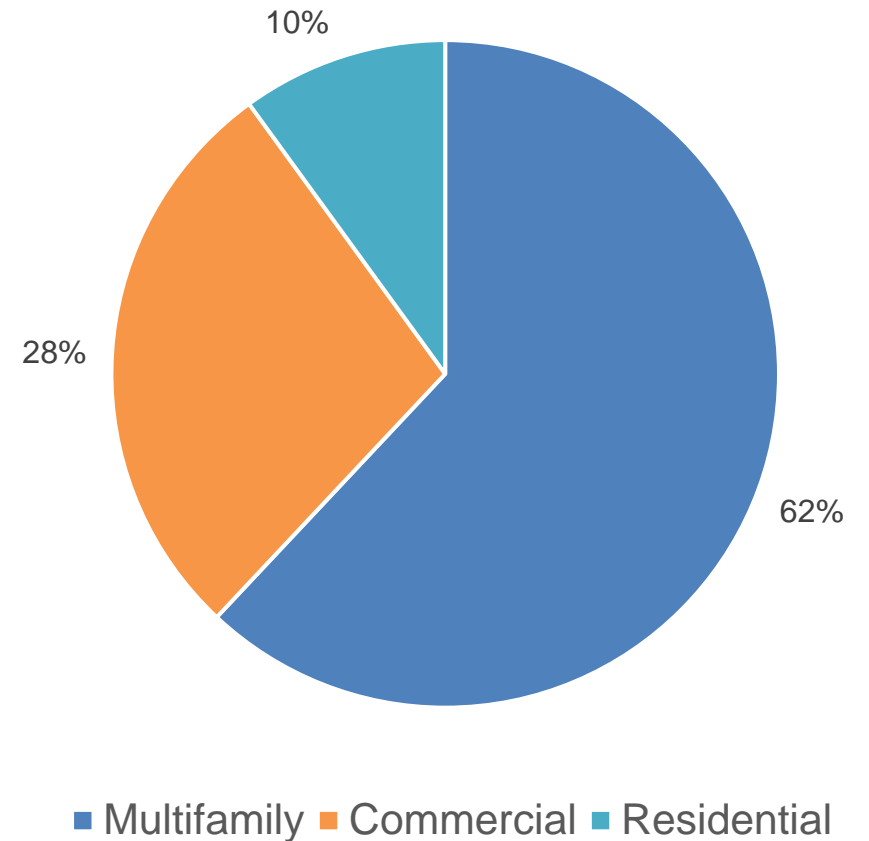
# Decarbonization Efforts

- Michael Sanchick (CE), Jon Hilowitz (O&R)

# CECONY Gas Energy Efficiency

- The Con Edison gas energy efficiency (“EE”) programs are part of the New Efficiency: New York (“NE:NY”) portfolio.
- The current NE:NY Program budgets and targets are set through 2025
- The Public Service Commission is in the midst of an Interim Review to evaluate the statewide NE:NY portfolio.
  - The Interim Review will likely result in updated budgets and targets through at least 2028 and potentially 2030
  - An Order concluding the Interim Review may be issued in late 2023 or early 2024
- Con Edison closed its gas residential HVAC Program in 2022 to encourage customers to participate in Clean Heat and electrification
- LMI gas increased by 50% year-over-year in 2022 and drove growth in the Company’s multifamily portfolio

**2022 Gas EE achievement by sector**



# CECONY Clean Heat

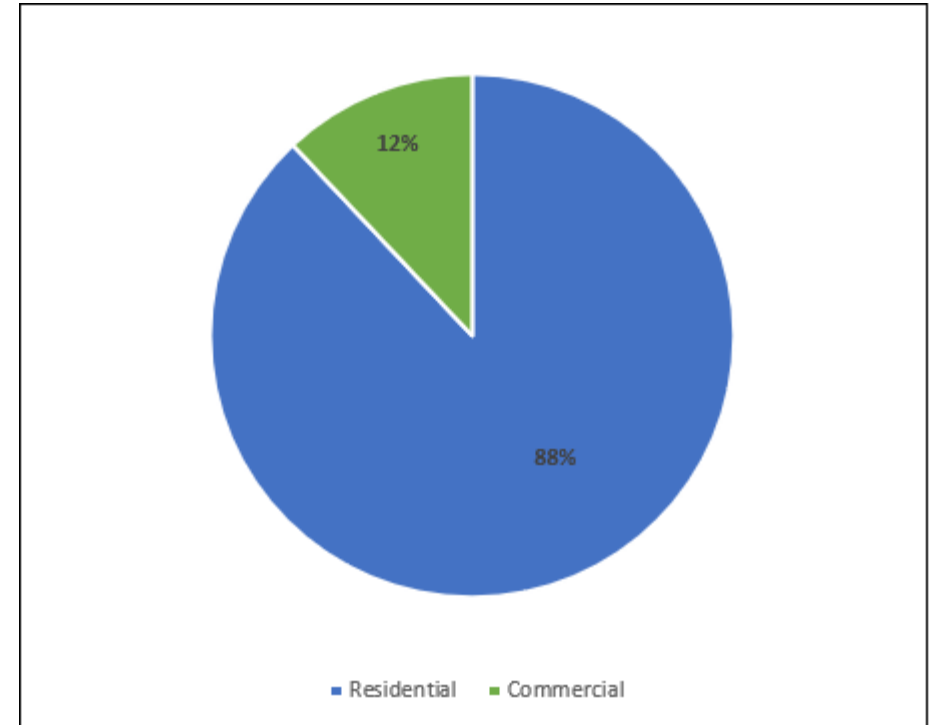
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- The Company's Clean Heat Program saw enormous growth in 2021 and 2022
  - Con Edison supported 11,768 projects in 2022, and 23,770 in 2020-2022
- Con Edison achieved its six-year (2020-2025) targets in Q1 2022 and expended its authorized budget
- Clean Heat paused accepting ASHP applications in May 2022, and Relaunched in January 2023
- In August 2022 the Commission authorized an additional \$518M for Clean Heat, mostly from transfers from other EE Programs and initiated a Continuity Funding Mechanism of \$10M per month through the conclusion of the Interim Review
- The Company successfully catalyzed a shift towards decommissioning in the residential market
  - Post-Relaunch, ~97% of residential projects decommission their existing fossil heating system

# OR Gas Energy Efficiency

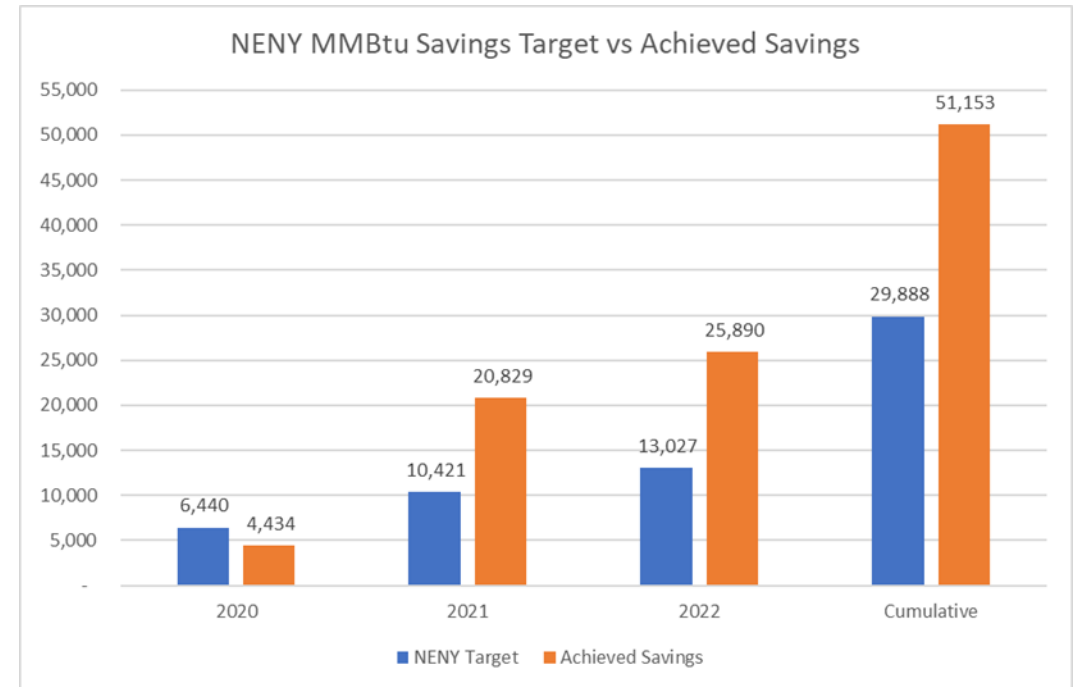
- The O&R gas energy efficiency (“EE”) programs are part of the New Efficiency: New York (“NE:NY”) portfolio.
- The current NE:NY Program budgets and targets are set through 2025
- The Public Service Commission is in the midst of an Interim Review to evaluate the statewide NE:NY portfolio.
  - The Interim Review will likely result in updated budgets and targets through 2025 - 2030
  - An Order concluding the Interim Review may be issued in late 2023 or early 2024
- O&R launched a 4-year partnership with NYSERDA to enroll LMI customers in EmPower in 2022
- For 2022, 359 LMI customers participated in EmPower producing 75,000 Lifetime MMBtu savings

**2022 Gas EE achievement by sector**



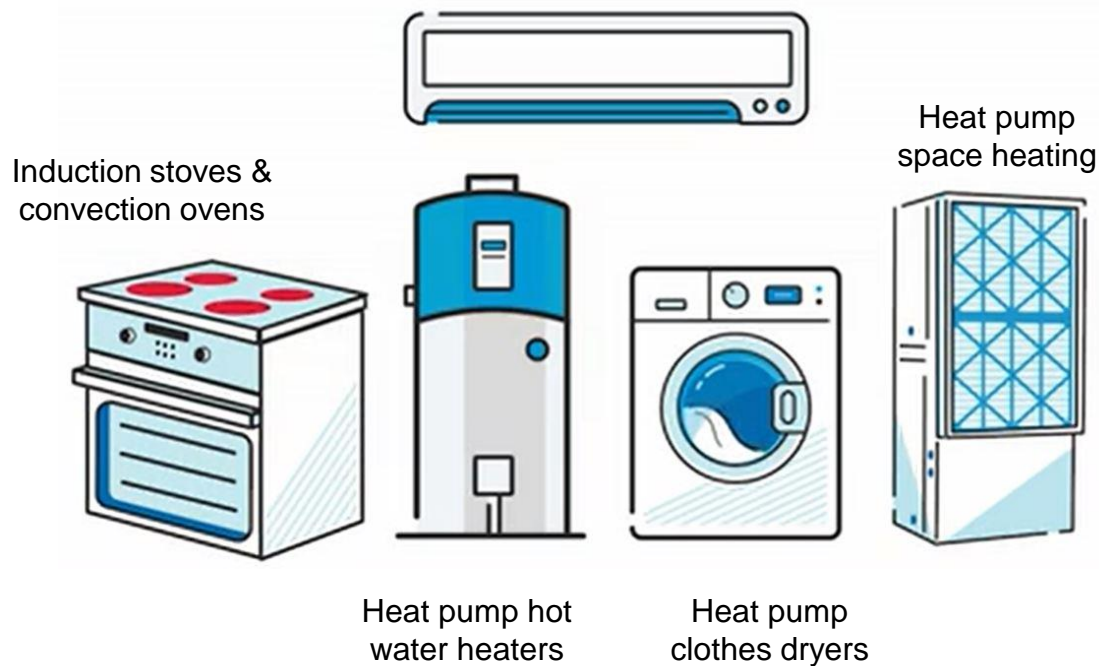
# OR Clean Heat

- The Company's Clean Heat Program saw enormous growth in 2021 and 2022
  - O&R achieved 200% of its NENY targets in 2021 and 2022 while remaining under budget
- Through 2022, O&R achieved 171% of its Program to Date NENY target expending only 129% of its PTD NENY budget
- Cumulative spending is \$141/MMBtu or 25% below the NENY budget of \$188/MMBtu
- O&R anticipates achieving 100% of its 20-25 NENY target in Q4 2023 while expending 75% of its 20-25 NENY budget
- O&R proposes to utilize remaining 2019-2022 electric EE portfolio funding to bridge program spending through 2025
- O&R anticipates the Interim Review will increase budgets and targets through the 2025 period and beyond

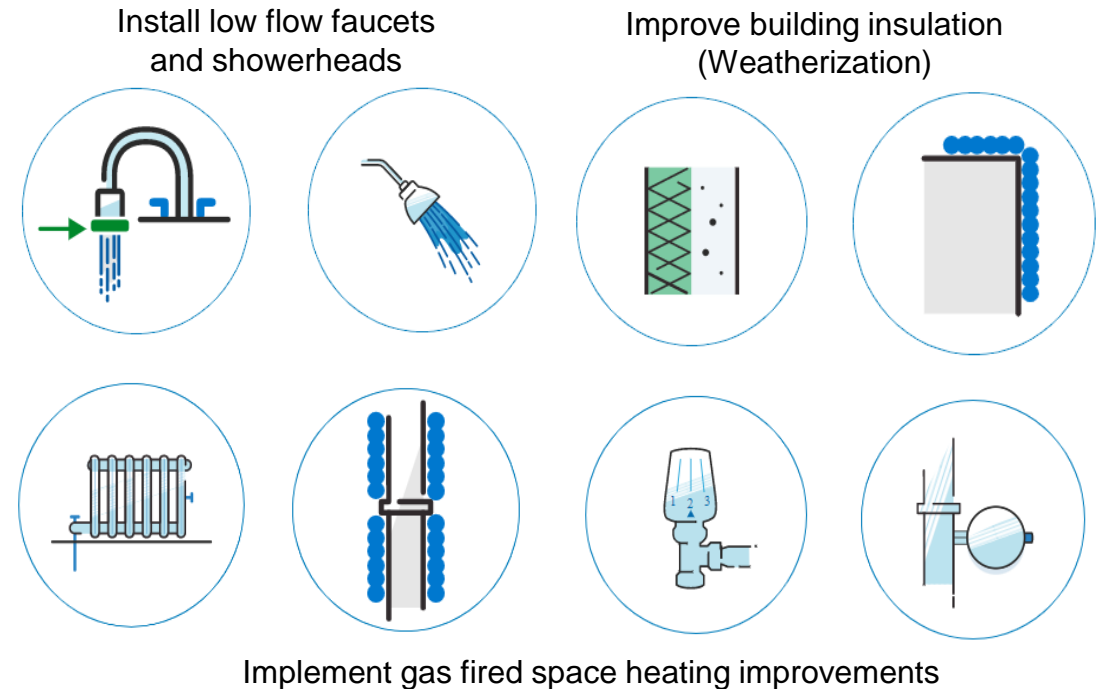


# Non-Pipeline Alternatives

- NPA projects replace or defer the need for gas system infrastructure through the use of demand side resources or load reductions (customer-side solutions)



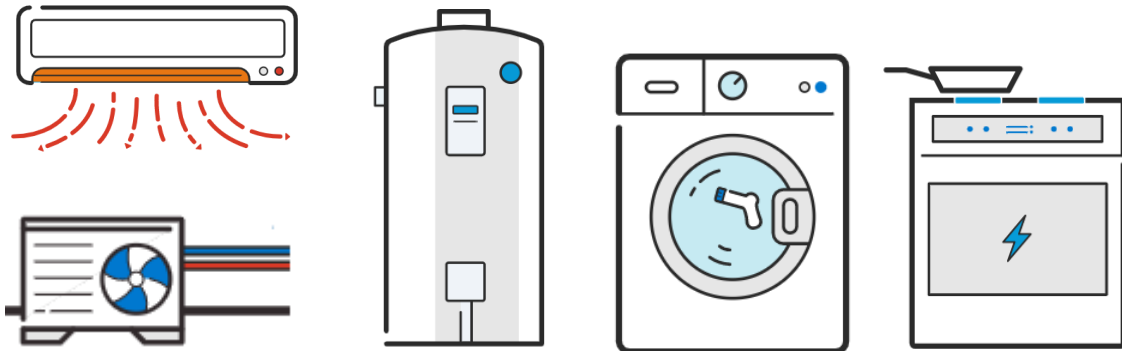
**Swap out Natural Gas Appliances for Electric**



**Gas Energy Efficiency (EE)**

# NPA Examples

- Traditional Solution: Gas main replacement
- Alternative: Whole Building Electrification
  - Primary goal is to abandon Leak Prone Pipe without replacement
  - Target specific gas main segments serving a low number of customers
  - All customers must agree to fully convert all gas end uses to electric



- Traditional Solution: Gas distribution system reinforcements
- Alternative: Area Load Relief NPA
  - Geographically targeted for demand reduction
  - Specific peak day goal
  - Achievement required for specific years
  - Combination EE and Electrification
  - Analogous to current NWS option







# **Gas Supply Procurement, Transportation, and Storage**

- Kathleen Trischitta

# MAJOR COMPONENTS OF A NATURAL GAS BILL

## Supply Costs Are A Significant Portion of Customer Costs

Supply  
Costs

**Commodity:** The natural gas itself



**Capacity:** Reserved space in an interstate pipeline or storage field



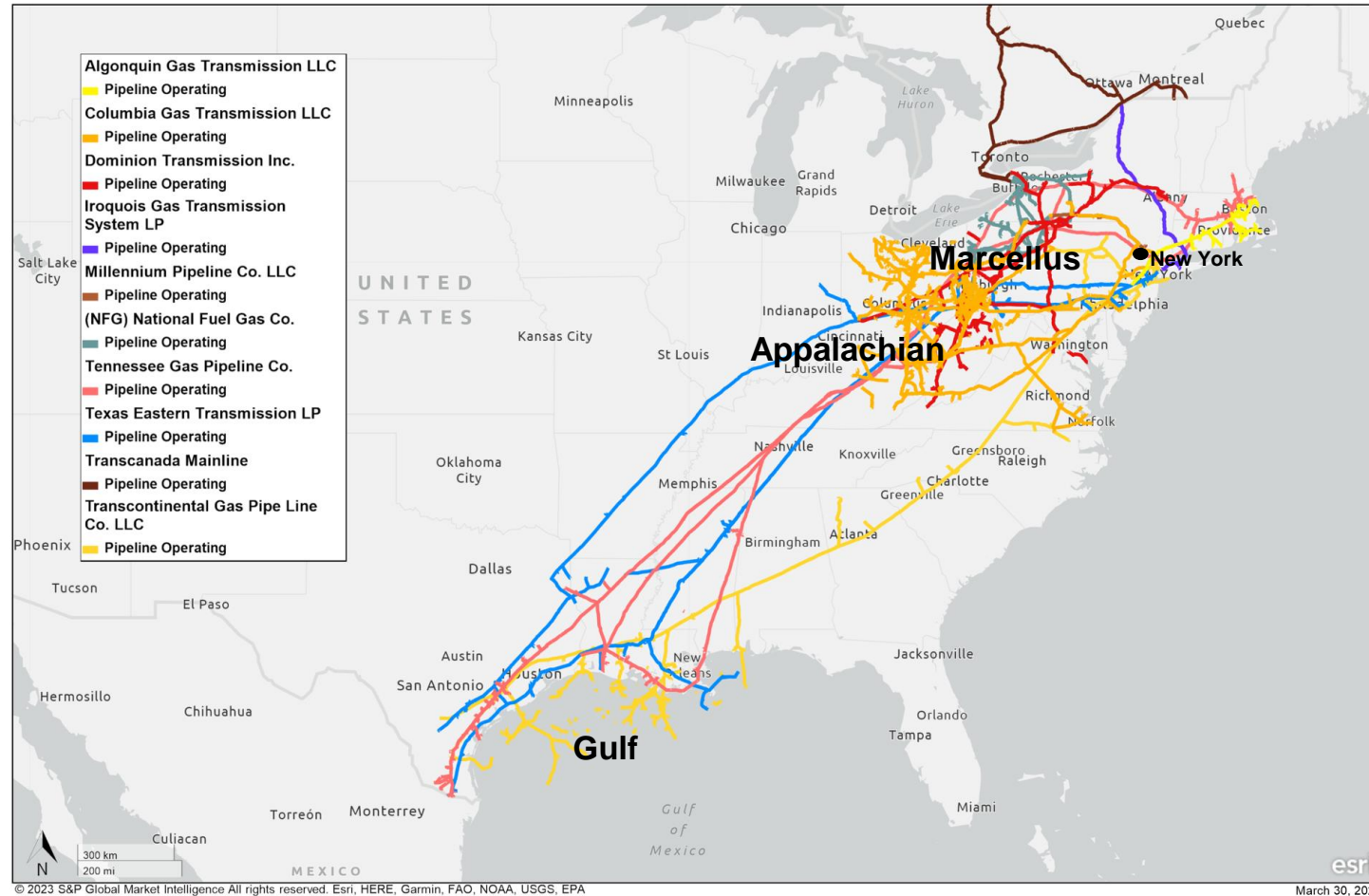
**Local Distribution:** Delivering the gas to customers



# CECONY AND O&R MAINTAIN A JOINT GAS PIPELINE AND STORAGE PORTFOLIO

## Reliability is Maintained through Diversity and Flexibility

S&P Capital IQ <sup>PRO</sup>

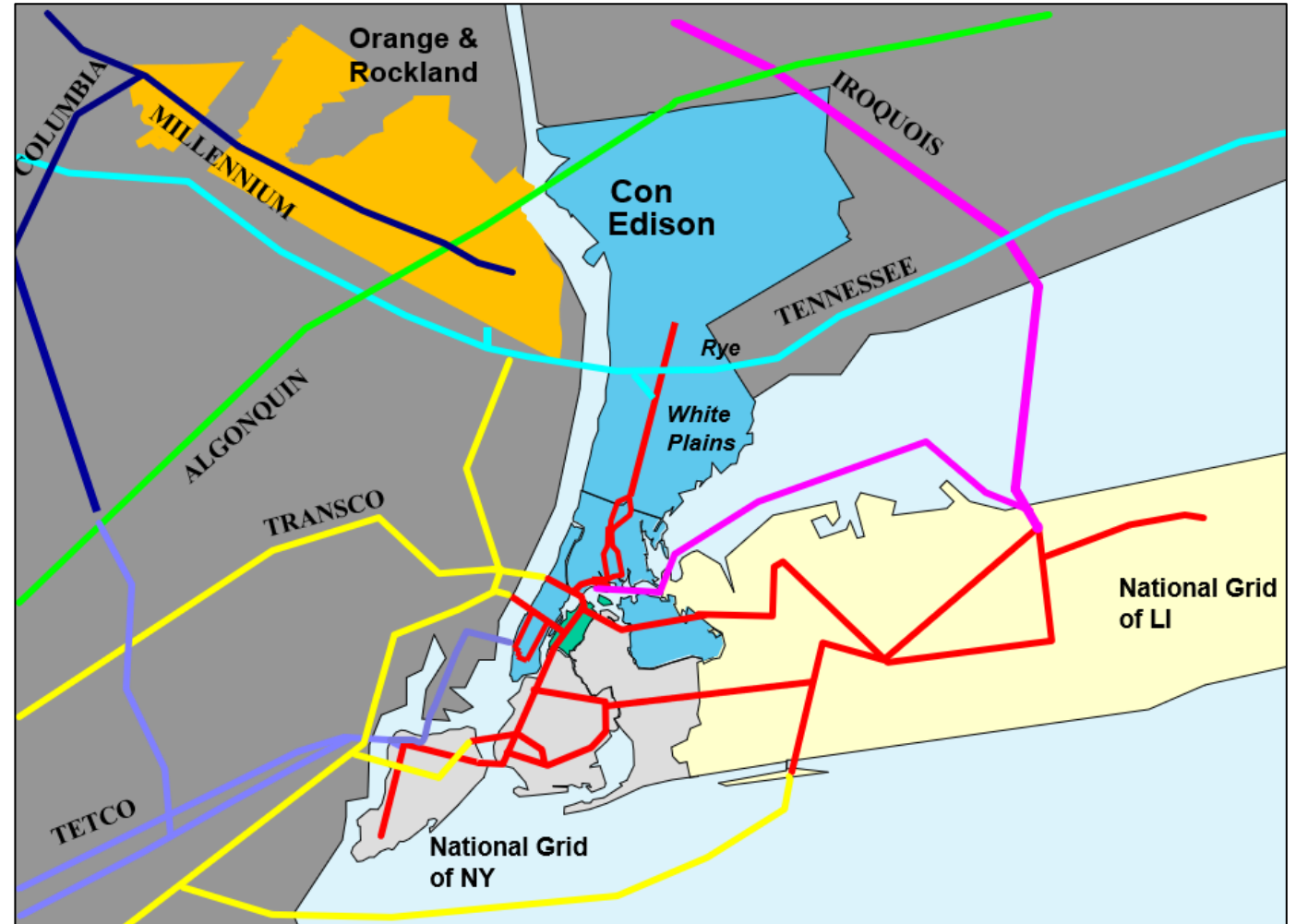


- Commodity can be procured from various producing regions:
  - Marcellus
  - Appalachian
  - Gulf Coast
  - Canada
- It is then transported to NY via existing contracts with eleven interstate pipelines or stored in one of twelve storage fields
- If needed, Delivered Services (the combination of commodity and interstate transportation) can be purchased at the NY citygates from third parties, but availability is limited
- In addition, one LNG facility (Queens) and one trucked CNG facility (Westchester) are utilized on peak days

## DOWNSTATE NY IS SERVED BY MULTIPLE INTERSTATE PIPELINES

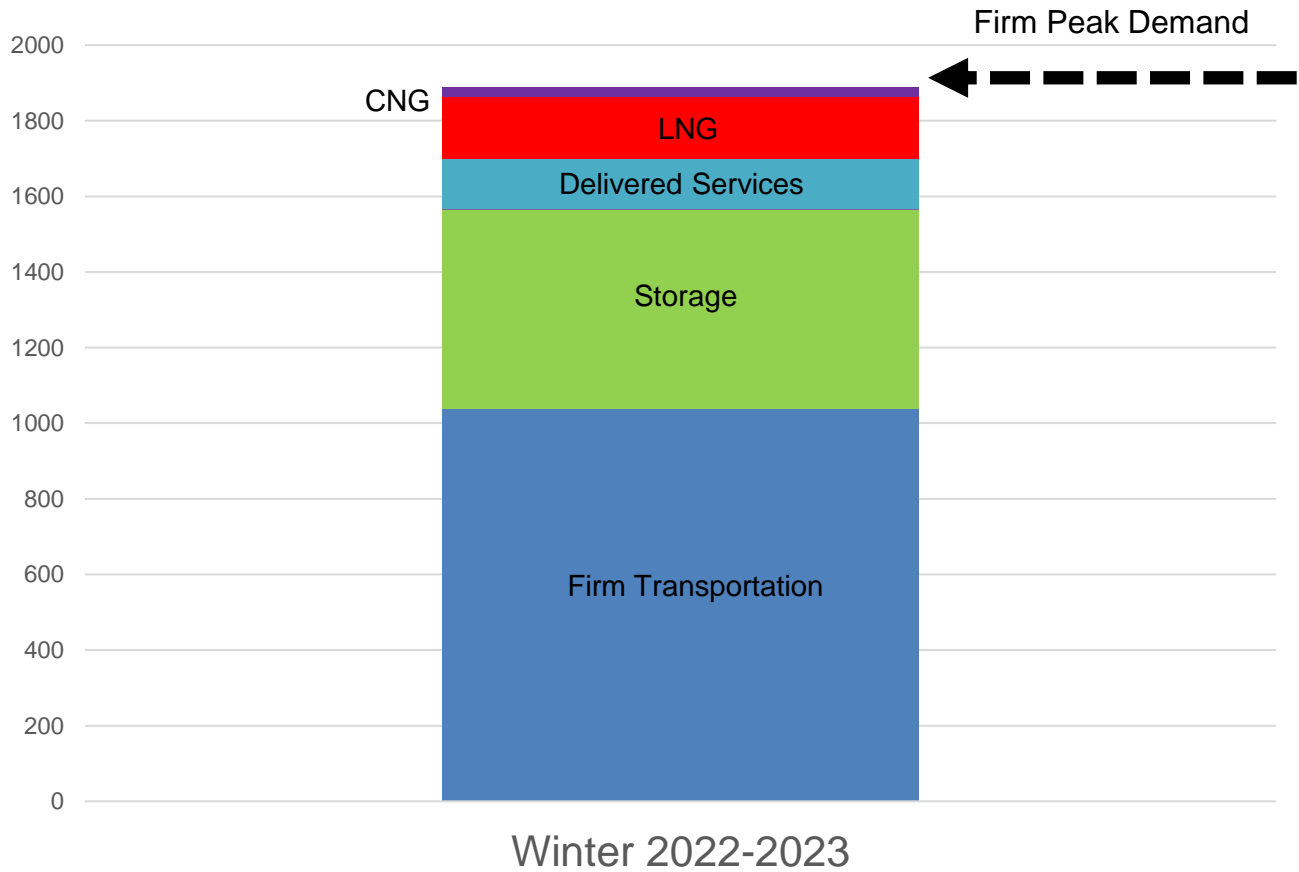
# The New York Facilities adds Accessibility and Flexibility

- Seven different interstate pipelines service the downstate NY region
- Four of those deliver into the **NY Facilities System** which is jointly owned by Con Edison, National Grid NY and National Grid LI
- The NY Facilities Agreement governs the operation, maintenance and utilization of the system
- Each member company has specified rights to receive supply from the various interstate pipelines
- The member companies work together to safely and reliability operate the NY Facilities while balancing supply and demand each gas day



# THE PORTFOLIO MUST BE CAPABLE OF MEETING THE COMBINED FIRM CUSTOMER PEAK DEMAND

## Winter 2022/2023 Peak Demand Requirement was 1,896 Mdt/day

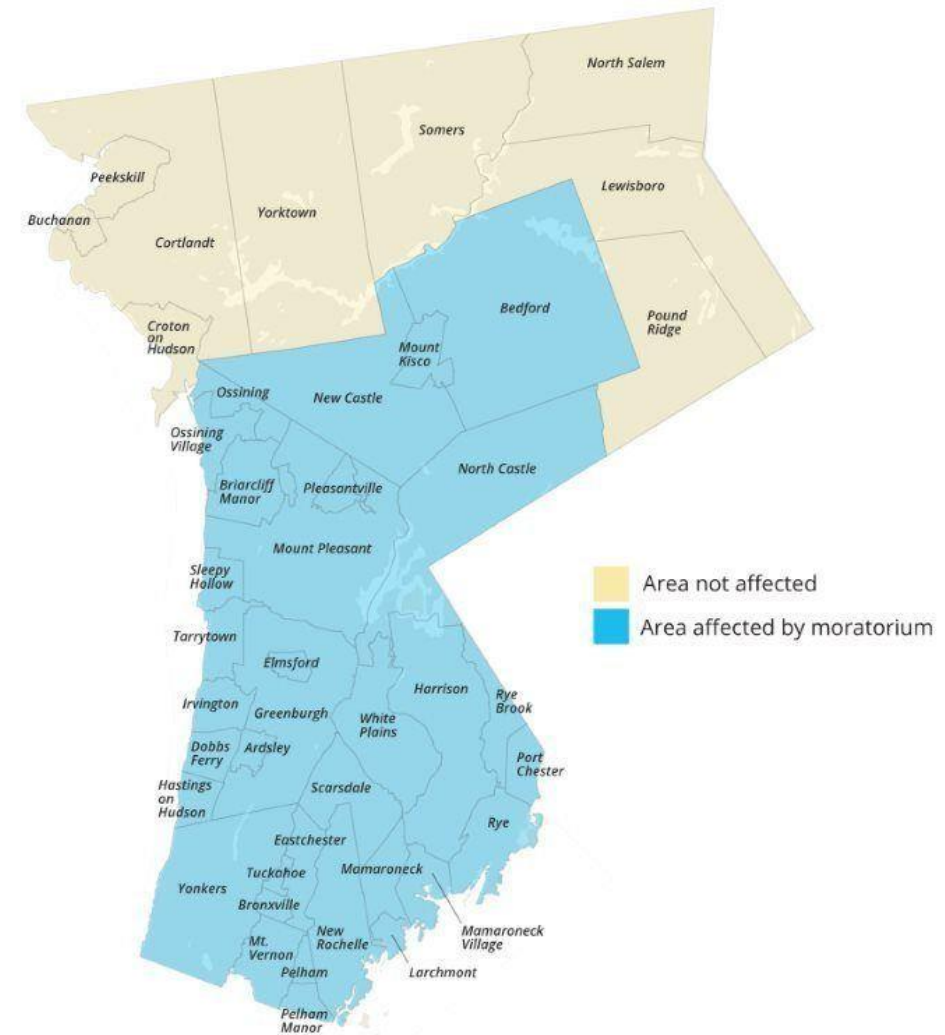


- Con Ed and O&R maintain a portfolio capable of meeting the pipeline capacity needs of all firm customers
- Reliance on Delivered Services in large volumes can increase performance, renewal and price risk
- Assets are released to Gas Marketers serving firm customers as per the respective retail access program
- The Companies procure commodity for full-service customers and the Gas Marketers procure commodity for retail access customers

# THE WESTCHESTER GAS MORATORIUM HAS BEEN IN PLACE SINCE MARCH 2019

## Downstate NY is Pipeline Capacity Constrained

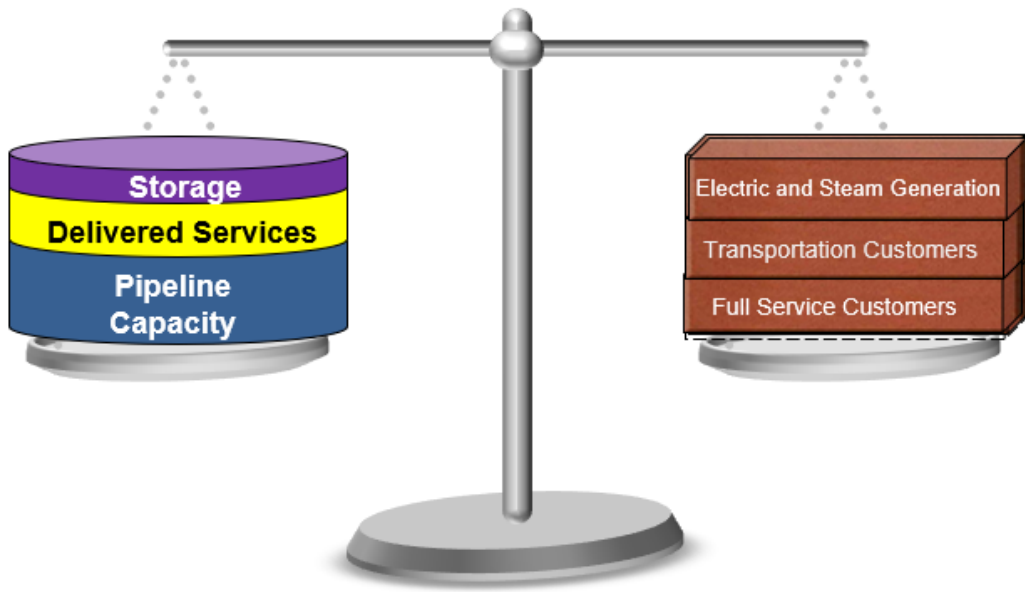
- After, NYC passed regulations **phasing out the use of #6 and #4 oil** in 2011 the firm peak demand for natural gas in downstate NY surged, considerably outpacing the addition of new interstate pipeline capacity to serve the region and increasing reliance on delivered services
- In 2017, Con Edison launched the first of its kind, **“Smart Solutions for Gas Customers”** which included increased energy efficiency, a pilot program for demand response and an RFP for non-pipeline alternatives to be pursued in parallel with traditional interstate pipeline infrastructure additions to assist in meeting customer demand
- Unfortunately, by early 2019, it was clear that peak demand for firm gas would exceed available supply in most of Westchester County if growth was not halted and a **moratorium was enacted**



# EACH GAS DAY AN ECONOMIC DISPATCH OF SUPPLY VERSUS DEMAND IS PERFORMED

## Changing Customer Demands Must be Balanced

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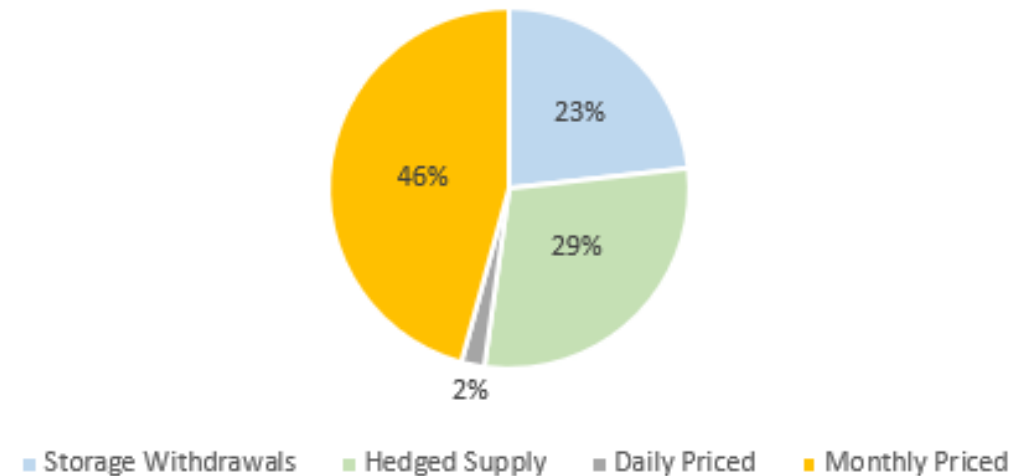
- Pipeline deliveries of supply must be kept in balance with customer usage in order to avoid pipeline penalties and maintain adequate system pressures
- The Companies are providing balancing to the system, which includes all customer types:
  - Full-service firm and interruptible customers
  - Firm and interruptible transportation customers served by Gas Marketers
  - Electric & Steam Generation Facilities
- The Companies have 24x7 gas procurement & scheduling coverage to:
  - Dispatch supplies on a day ahead basis
  - Make intra-day changes as needed
  - Respond to changing pipeline conditions

## MANAGING SUPPLY PRICE VOLATILITY

# A Combination of Physical and Financial Hedging is Utilized

- Natural gas is a volatile commodity market, influenced by weather, the cost of competing fuels and global events
- To mitigate the volatility associated with the customer's gas supply costs the Companies:
  - Procure gas for injection into storage in the summer for withdrawal and utilization during the, typically higher priced, winter months
  - Execute a variety of financial hedging instruments such as swaps, call options and collars prior to fix or range bound the cost of winter supplies
- The Companies also offer budget billing payment options and payment plans for struggling customers

Winter Plan  
November 1st - March 31st





# COMPANIES ARE EXPLORING MARKET OPTIONS TO POTENTIALLY REDUCE UPSTREAM GHG EMISSIONS

## Certified Natural Gas Pilot

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- An increasing number of gas producers are now offering certified natural gas products
- **Certified natural gas** is produced by companies whose operations are independently verified as meeting or exceeding industry recognized environmental, social, and governance standards
- CECONY (through its pending rate case settlement) and O&R (through its currently effective rate settlement) have sought approval for a certified natural gas procurement pilot
- The pilot will allow for \$900,000 of **incremental gas cost** to be recovered annually (\$800,000 from Con Ed and \$100,000 from O&R customers) as incurred as payment for a premium associated with certified gas purchases
- The intent of the pilot is to gain experience with the available products, evaluate both supplier and certification entity performance, and determine the potential benefit of certified gas procurement in reducing upstream GHG emissions



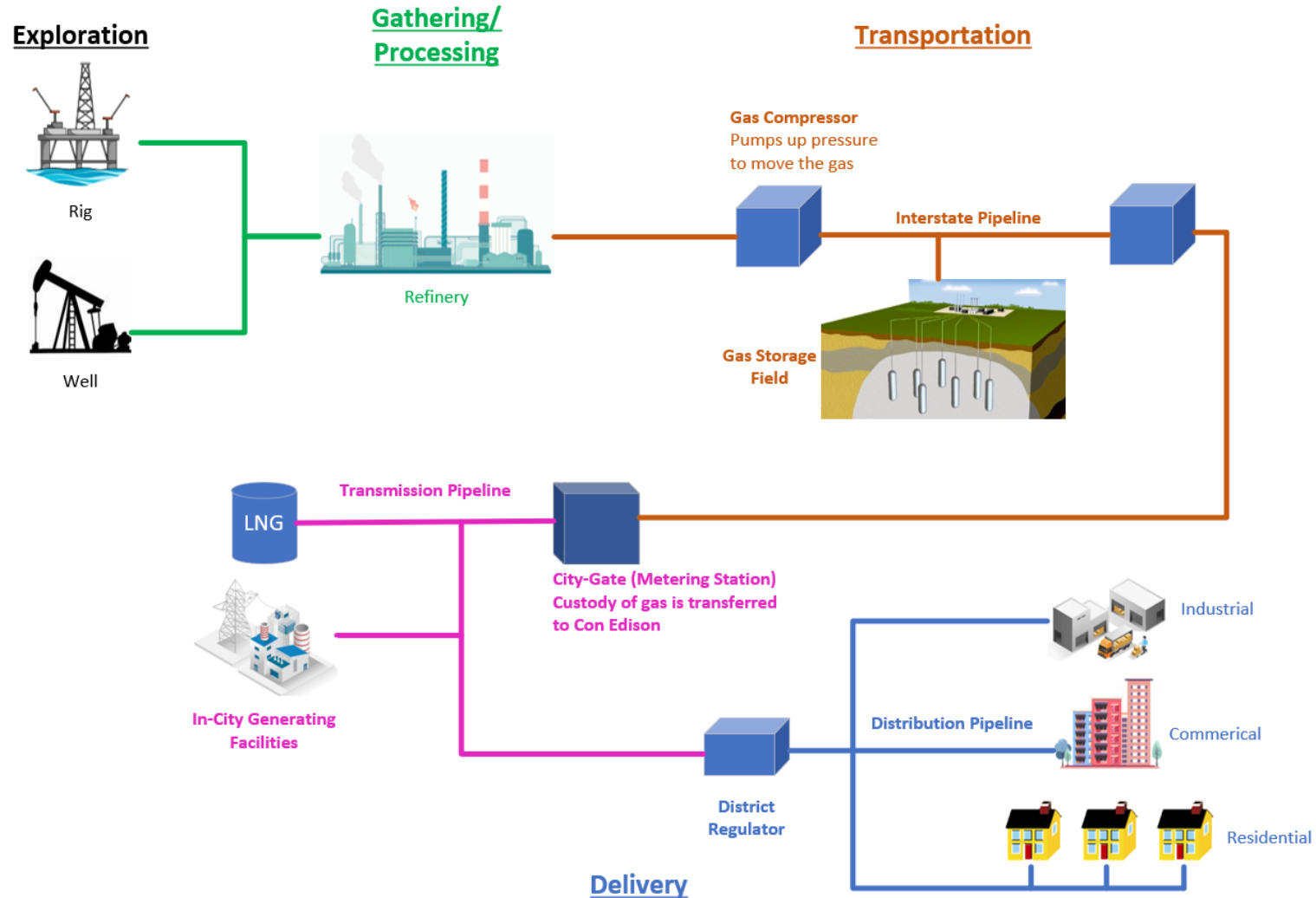
PROJECT  
**CANARY**



# **Distribution System Engineering and Operation**

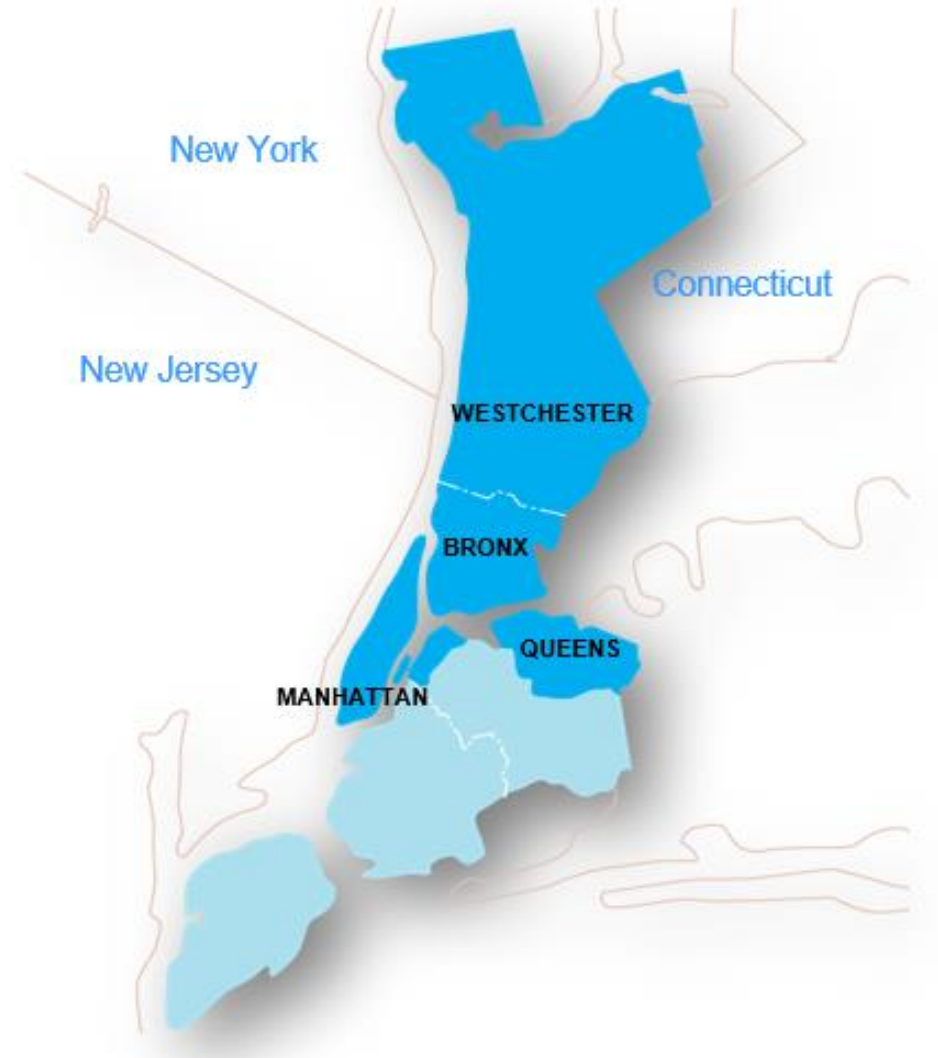
- Tony Mancino (CE), Nick Hellen (CE), Flannan Hehir (O&R)

# Gas System from Source to Customer



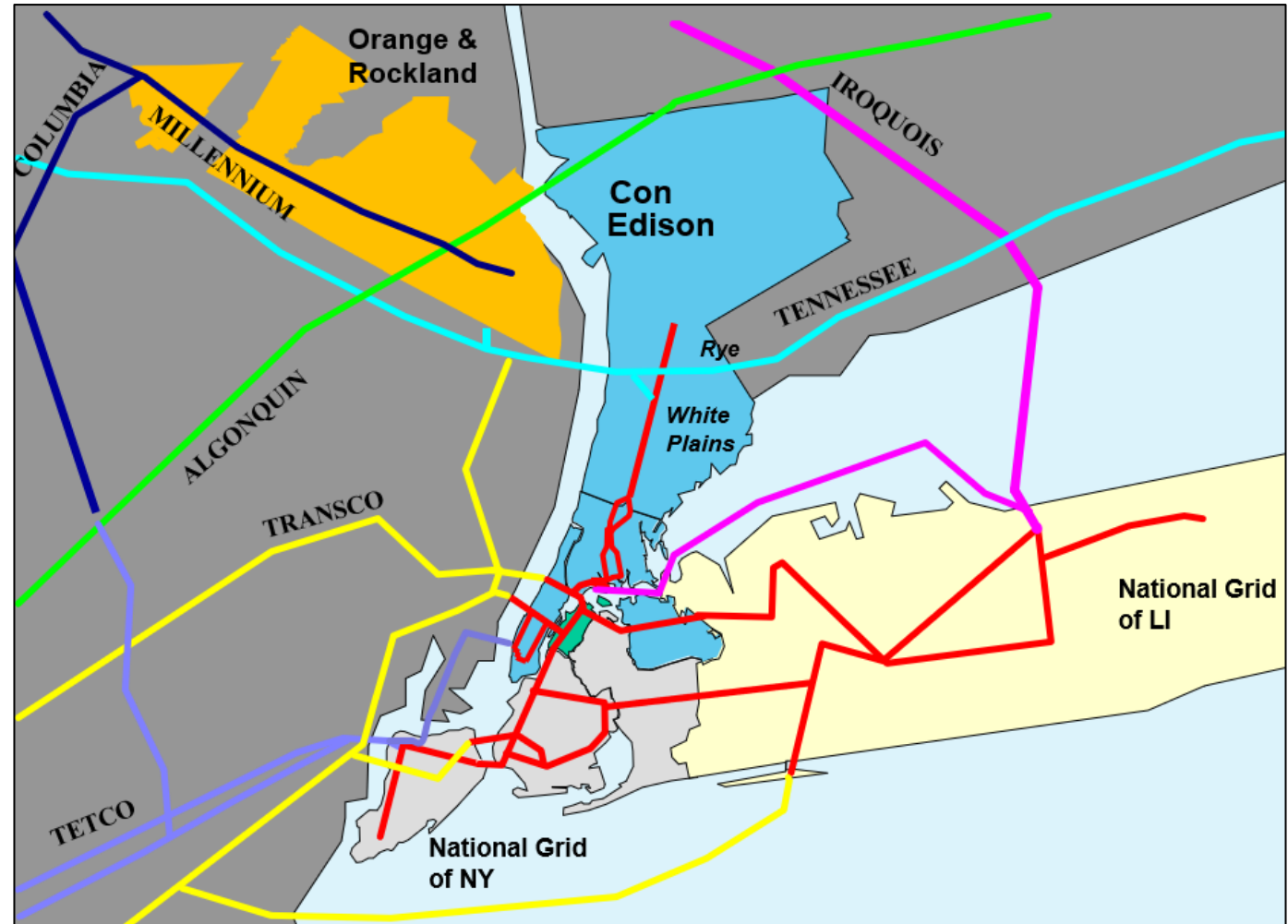
# Where is **CECONY's** distribution system?

- Includes 3 boroughs in NYC and Westchester



# CECONY - New York Facilities

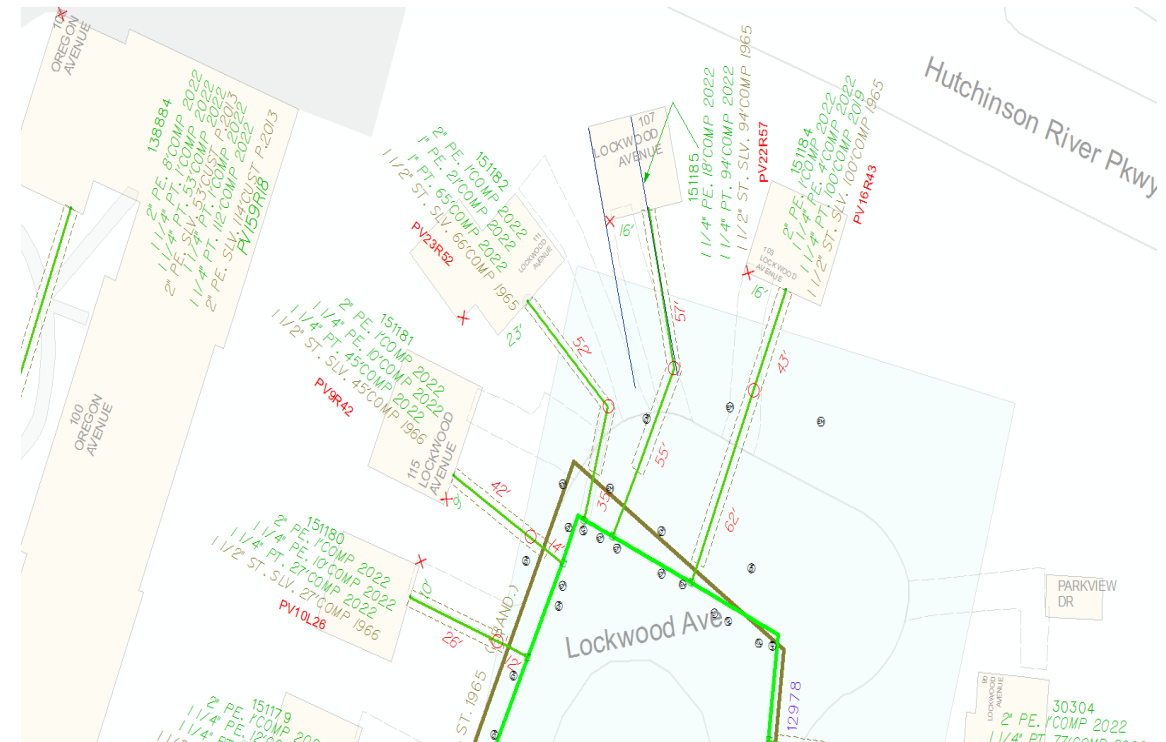
- CECONY and National Grid rely and support each other when needed
- Member company is responsible for maintaining the NYF system in their service territory
- Member companies and pipeline drills are run annually
- Joint design committee runs hydraulic models for 5- year load requirements and temperature sensitivities
- Maintain and run scenarios of hydraulic system



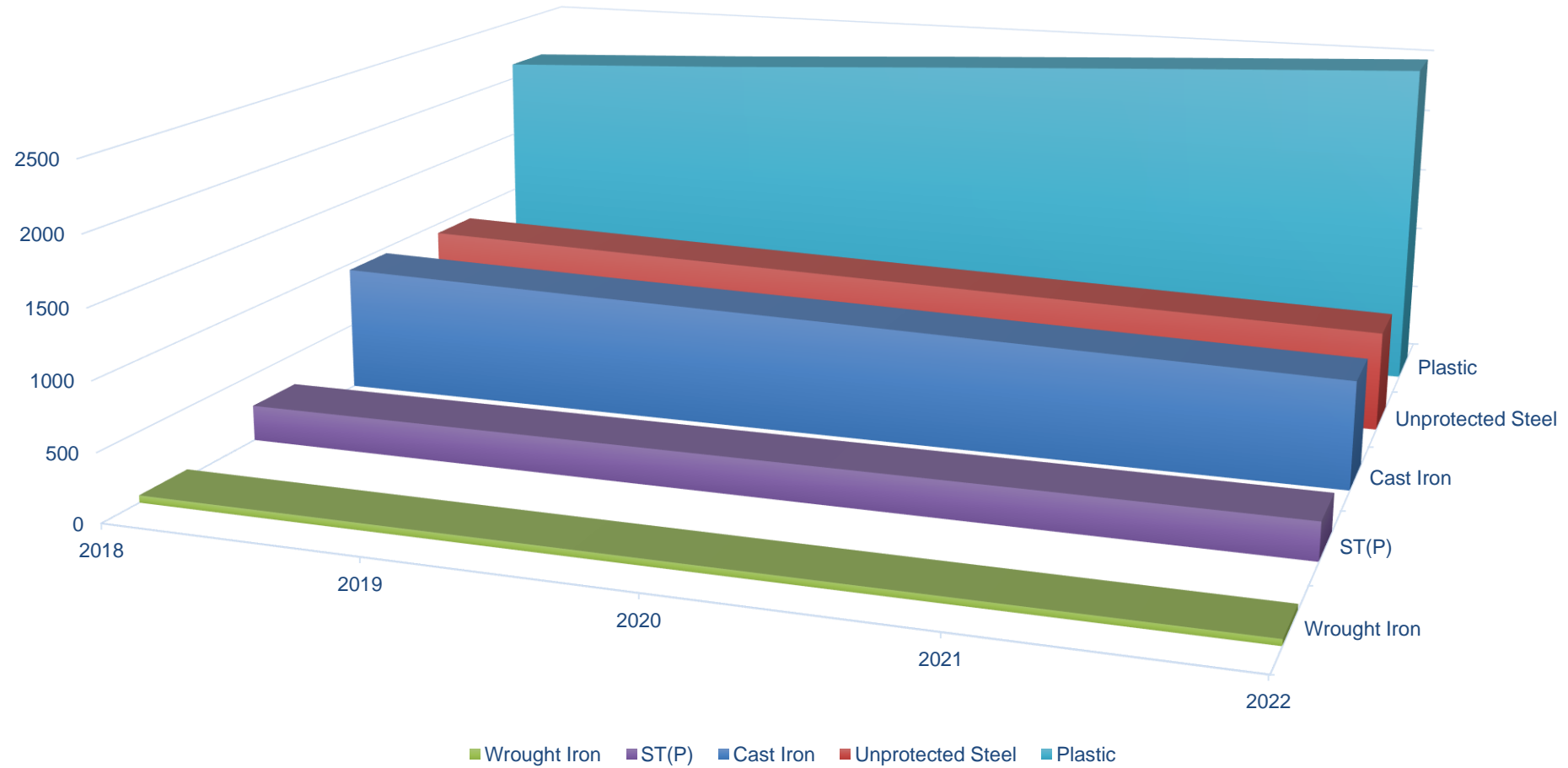
# CECONY - What makes up the system on your street?



- Low Pressure, 4-12" WC
- Medium Pressure, 2-15 psig
- High Pressure, 15-99 psig



# CECONY - Gas Distribution Main Inventory by Material



## **CECONY - Safety Focus**

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- Patrols for 3<sup>rd</sup> party damage excavation (exceeds code requirement)
- Leak survey monthly (exceeds code requirement)
- Newly installed pipe operates at lower percent SMYS (specified minimum yield strength) which is a higher safety margin
- New technology (laser) detection for leaks



# How do we determine where to replace pipe?

- Annual replacement of pipe
  - Top ranked pipe from Risk Model
  - Pipe in flood prone areas
  - Simplification projects to reduce system footprint
- Overall goals to reduce methane emissions and improve safety



Risk Model Tool

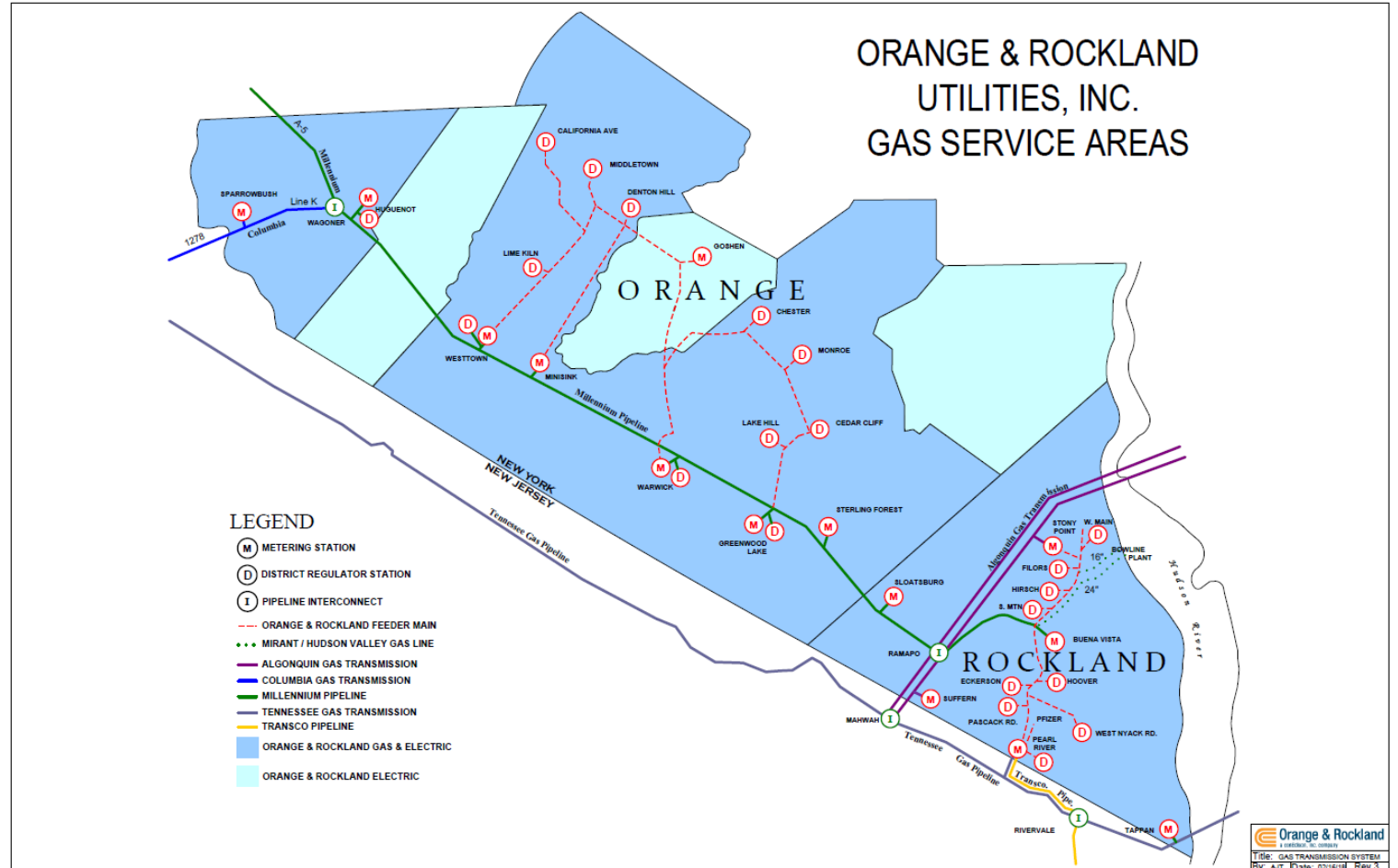
# How do we determine how to replace pipe?

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- Risk model calculates Project Risk Score
  - Combination of Probability of Failure (POF) and Consequence of Failure (COF) for mains and services.
- Factors included in Probability of Failure (POF):
  - Harsh Environment
  - Corrosion Indicators
  - Proximity to Electric Structures
  - Failed Inspections
- Factors include in Consequence of Failure (COF):
  - Building Class
  - Building Proximity
  - Pipe Depth
  - Population Density
  - Pressure of Gas

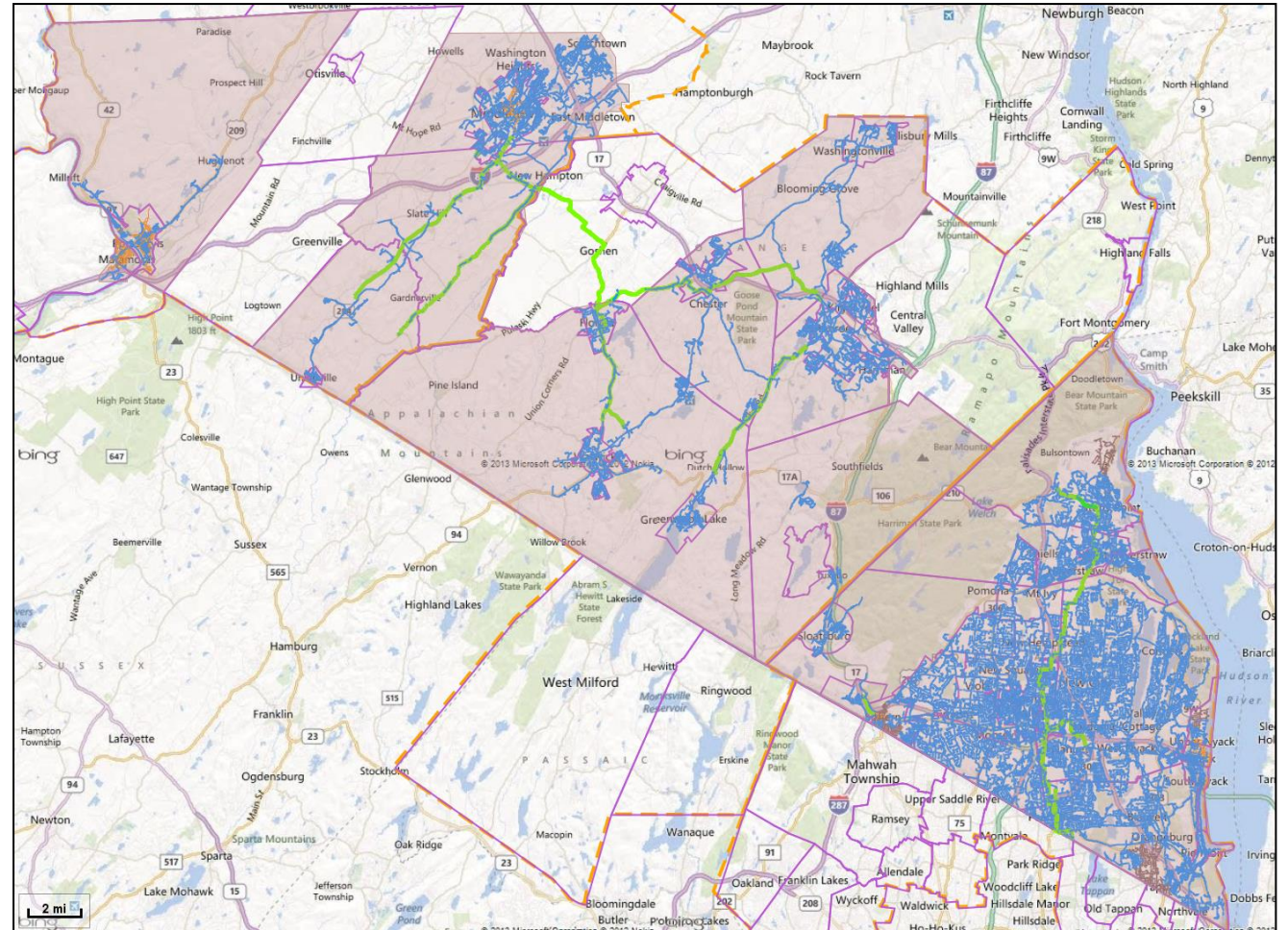
# O&R's Distribution System

- Includes parts of Orange County and all of Rockland County
- Three interstate pipelines supply gas to O&R's service territory
- 13 Gate Stations

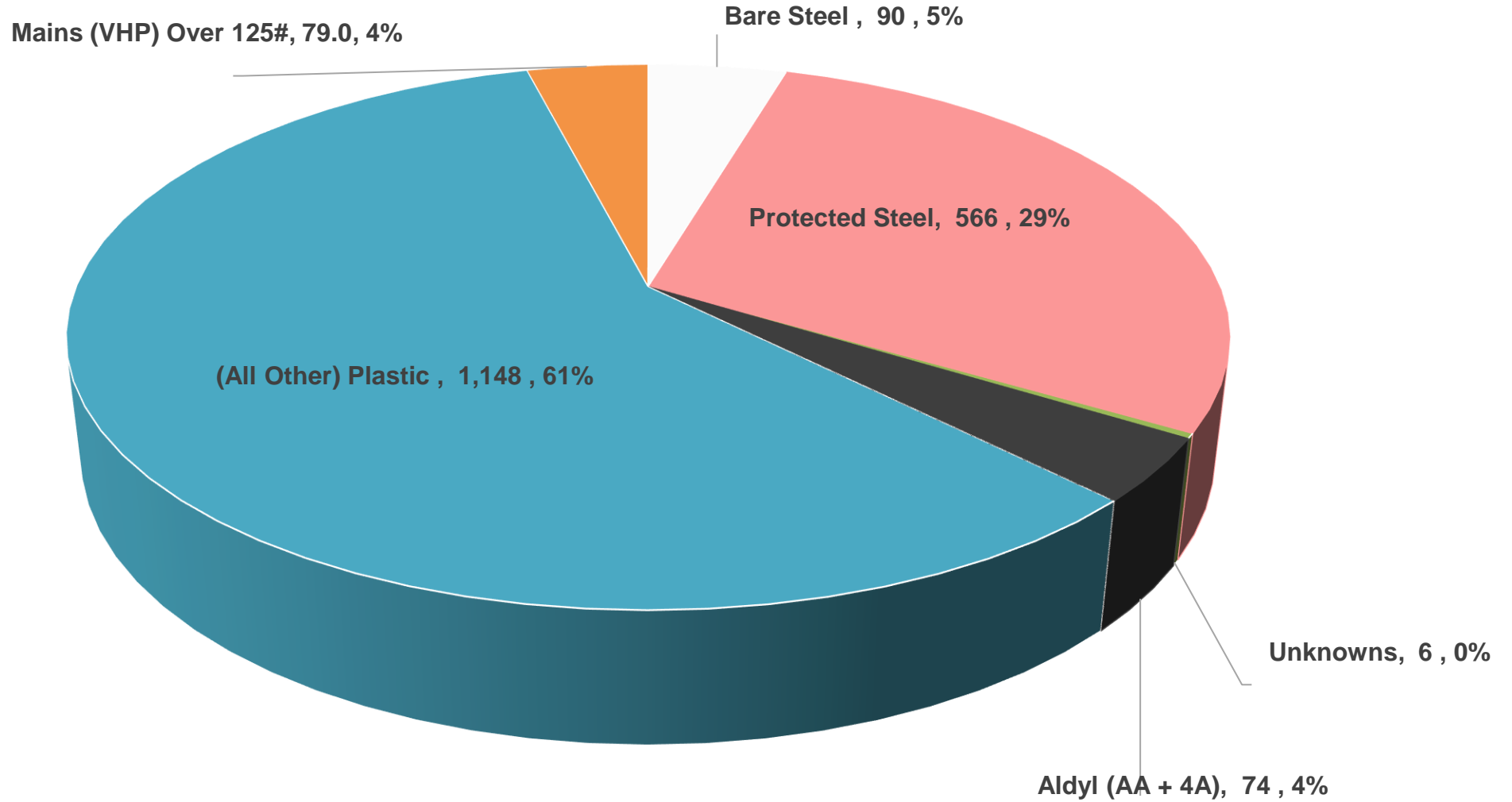


# Where is O&R's distribution system?

- Transmission system pressure above 125 psig (green lines)
- Distribution system pressure at and below 125 psig (blue lines)
- Distribution system is heavily concentrated in certain areas
  - Predominantly a high-pressure distribution system 60-80 psig MAOP (maximum allowable operating pressure)



# O&R - Gas Distribution Main Inventory by Material



## O&R - Safety Focus

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- Leak prone pipe replacement – remaining 10% to be completed by 2030
- Maintain ROVs (remote operated valves)
- Improved emergency response
- Damage Prevention Program
- Upgrade on certain regulating and gate stations
- Integrity management program



# Utility Emissions

- William Slade

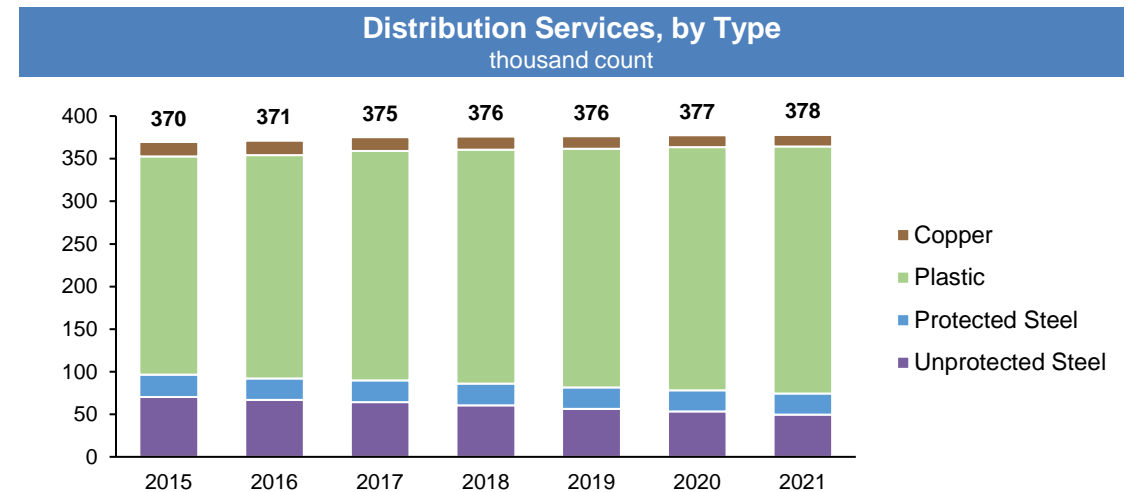
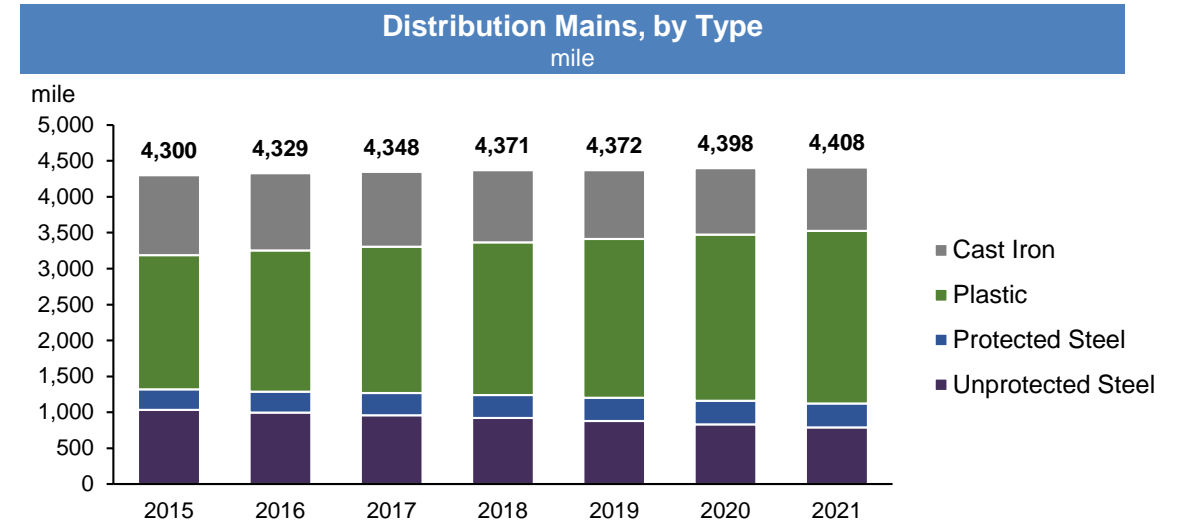
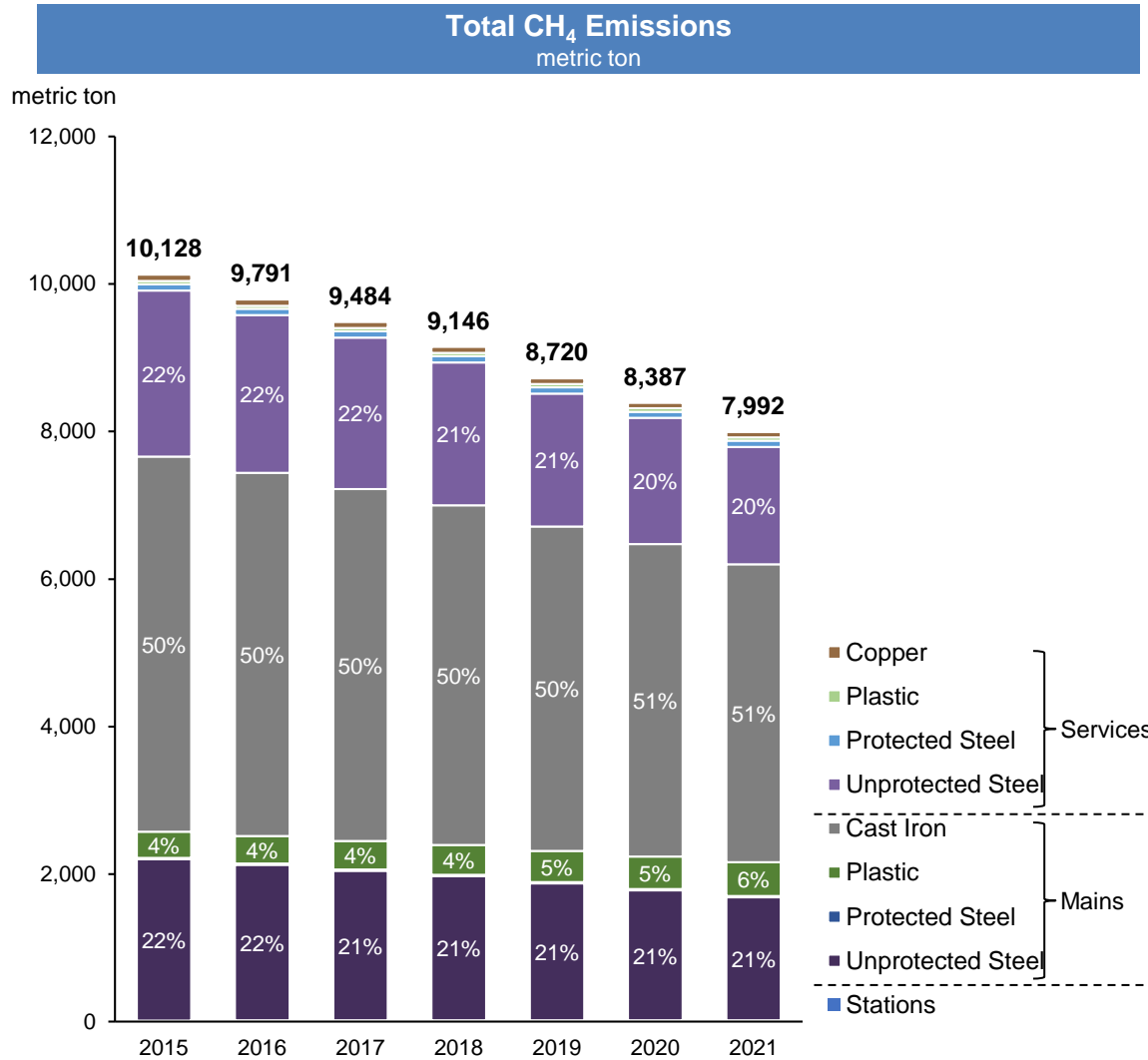
# Greenhouse Gases Classification

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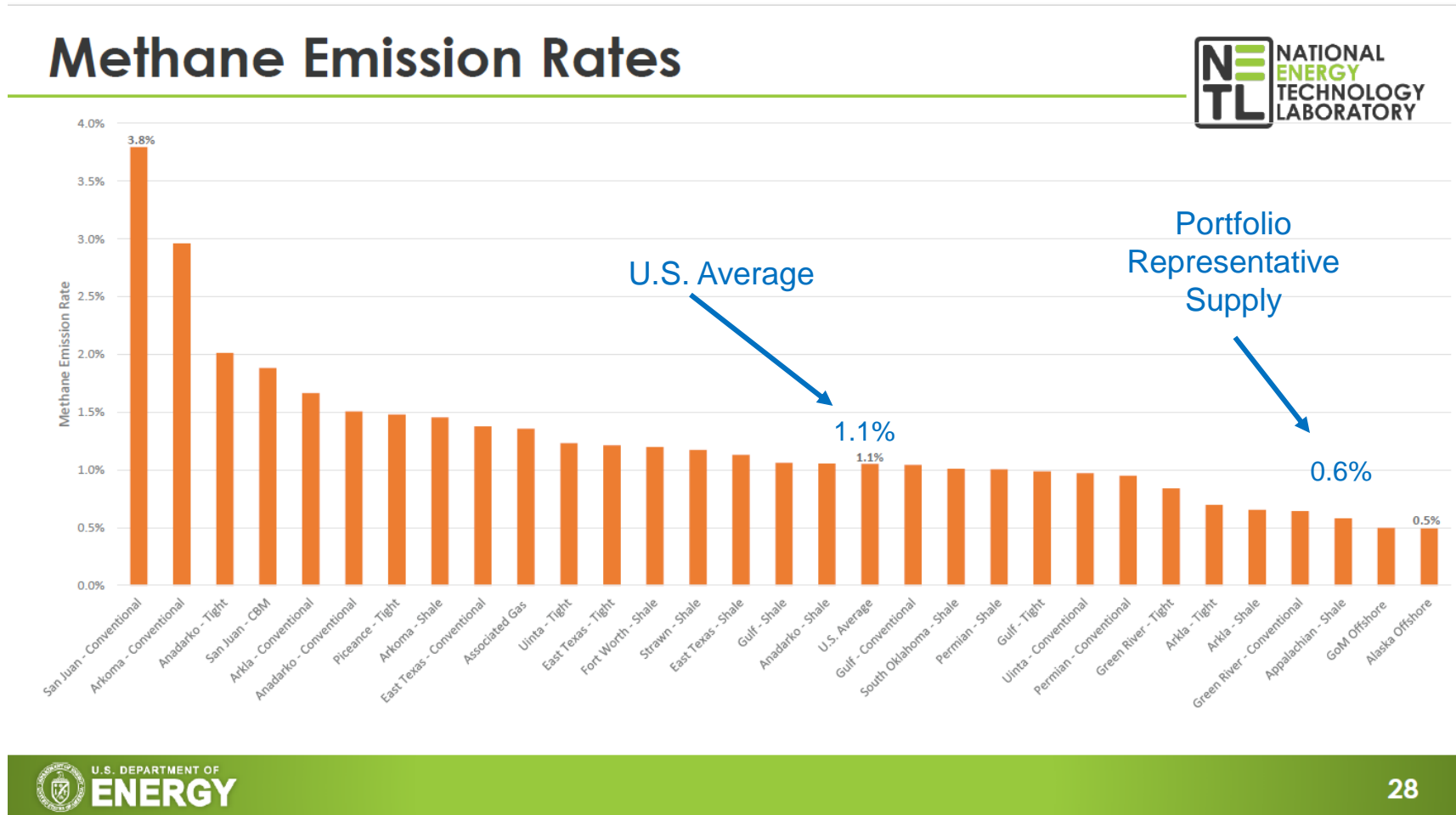
- Scope 1 – Direct Emissions from Company Owned & Controlled Resources
  - Mains & Services
  - Metering & Regulation Stations
  - Combustion Units
  - Fleet Vehicles
- Scope 2 – Indirect Emissions released from consumption of purchased electricity
  - Corporate & Field Offices
  - Measurement & Regulation Stations
  - Corrosion Systems
- Scope 3 – Indirect Emissions from non-company owned upstream and downstream entities
  - Production & Transmission
  - Customer Usage/Combustion
  - Employee Commuting & Business Travel



# Main Replacement Programs Reduce Scope 1 Emissions



# Typical Supply Source Reduces Scope 3 (upstream) emissions



## Additional Initiatives Avoid Emission

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- Scope 1:
  - Monthly leak surveys reduce leak backlogs and shorten leak repair times
  - Cross compression captures gas normally vented to returns it to adjacent parts of the system
  - In-home methane detectors identify potential leaks faster
- Scope 3: Certified gas procurement pilot
  - Suppliers undergo rigorous assessment to identify emissions intensity
  - Gas supply certified to lower emission rate is purchased for a small premium
  - Certified gas emission rates as low as 0.05%

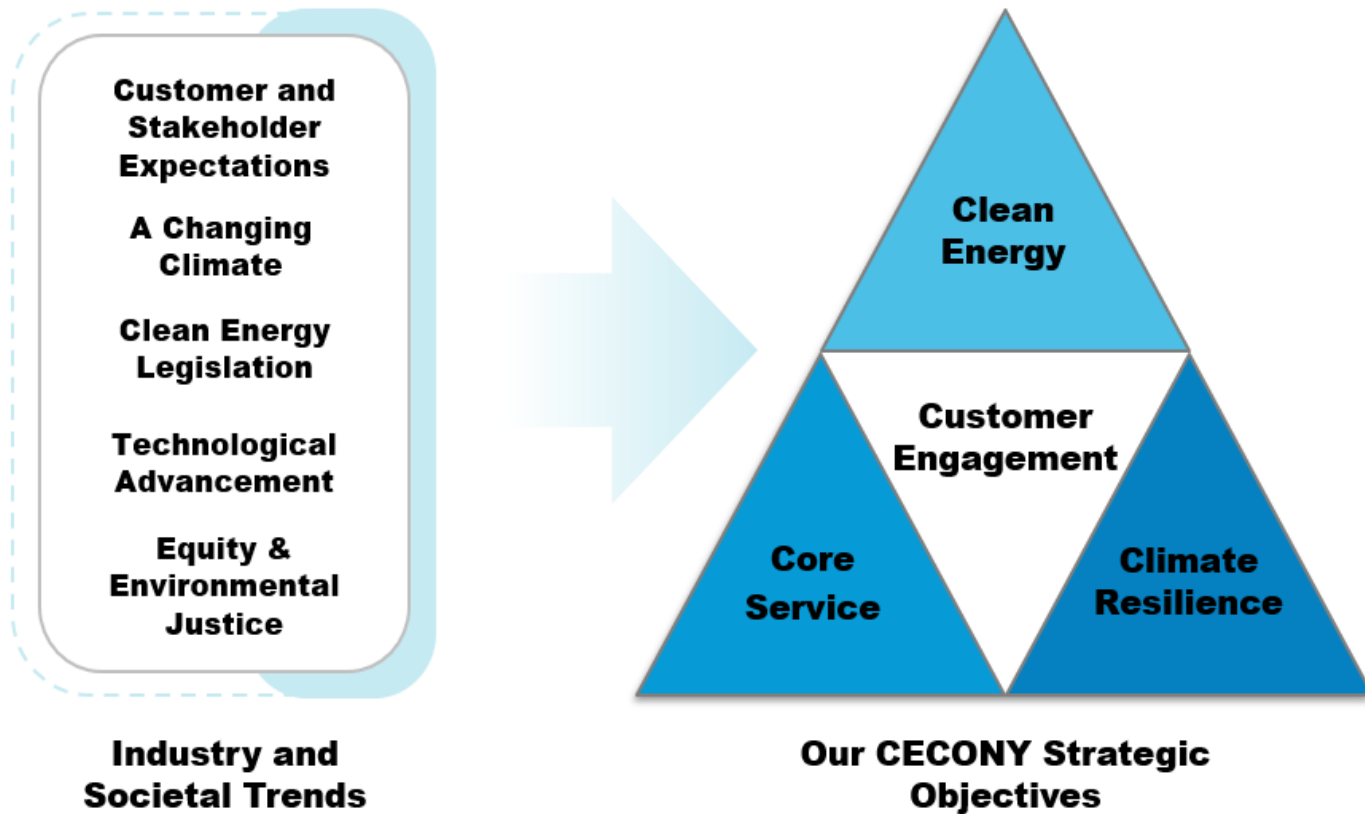


# **Gas Long Range Plan Overview**

- Shuchita Prakash

# Our integrated strategy

We are committed to meeting societal goals and our customer expectations. Our utility Long Range Plans articulate the strategy, actions, and investments needed to advance our commitment

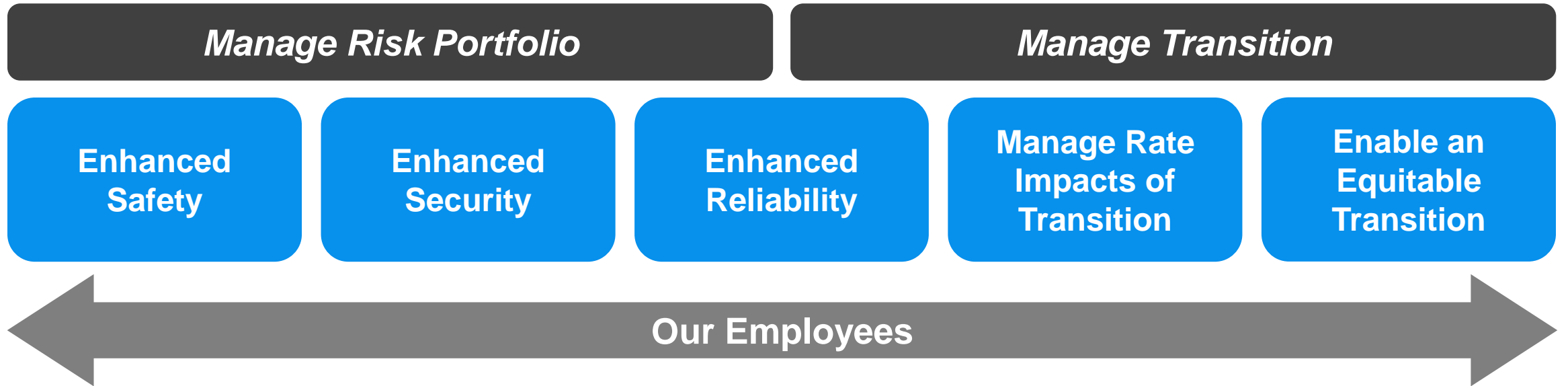


We developed this integrated strategy and to achieve four strategic objectives:

- **Clean Energy:** Economy-wide net-zero GHG emissions in our service territories by 2050
- **Climate Resilience:** Increased resilience of our energy infrastructure to adapt to climate change
- **Core Service:** World-class safety, reliability, and security, while managing the rate impacts and equity challenges of the energy transition
- **Customer Engagement:** Industry-leading customer experience and facilitation through the energy transition

# Key components of core service

We will continue to enhance our core foundational role in powering the economies of our service territories while managing costs, sharing benefits, and promoting the cost-effectiveness of the energy transition



# Initiatives to address climate risks

We are implementing our Climate Change Implementation Plan through a variety of initiatives, including the following examples

## Prevent: harden infrastructure

- Enhancing our engineering design standards to account for projected climate change in our service territories. All newly built infrastructure is being constructed to these new standards
- Evaluating and continuing to retrofit existing infrastructure to enhanced design standards, including through our MRP, which upgrades leak-prone pipe in flood prone areas
- Providing customers adequate pressure during winter peak demand periods, including through our Winter Load Relief (WLR) program

## Mitigate: minimize disruptions

- Deploying remotely-operated valves (ROVs) at strategic locations to minimize potential impacts and protect the public at large

## Respond: reduce recovery timeframe

- Updating our outage management system (OMS) and network of advanced metering infrastructure (AMI) to improve our visibility and ability to respond to events quickly and comprehensively

# Customer engagement

Customers today expect higher levels of comfort, convenience, choice, and control in all aspects of their lives

## Continue to Improve the Customer Experience

### Customer Surveys and Metrics

#### Customer Journey Mapping

#### Energy Efficiency Marketplace

#### Customer Relationship Management Upgrade

#### Customer Service System Upgrade

#### Customer Education and Empowerment

## Facilitating Customer Energy Choices

- Enable the customer to make the best individual energy choices in alignment with the state's climate goals
- Serve as a trusted advisor to the customer by establishing trust and respect
- Create an energy products and services marketplace through contractor and ecosystem relationships



# Role of utilities

The utilities will lead the clean energy transition and continue to focus on resilience, safety, reliability, and the customer experience

## • Past

- Universal access to energy that is:
  - Safe
  - Reliable
- Provide service at reasonable cost
  - Minimize bill impact
- Engineering and operations focus (operational excellence)
- Customer engagement

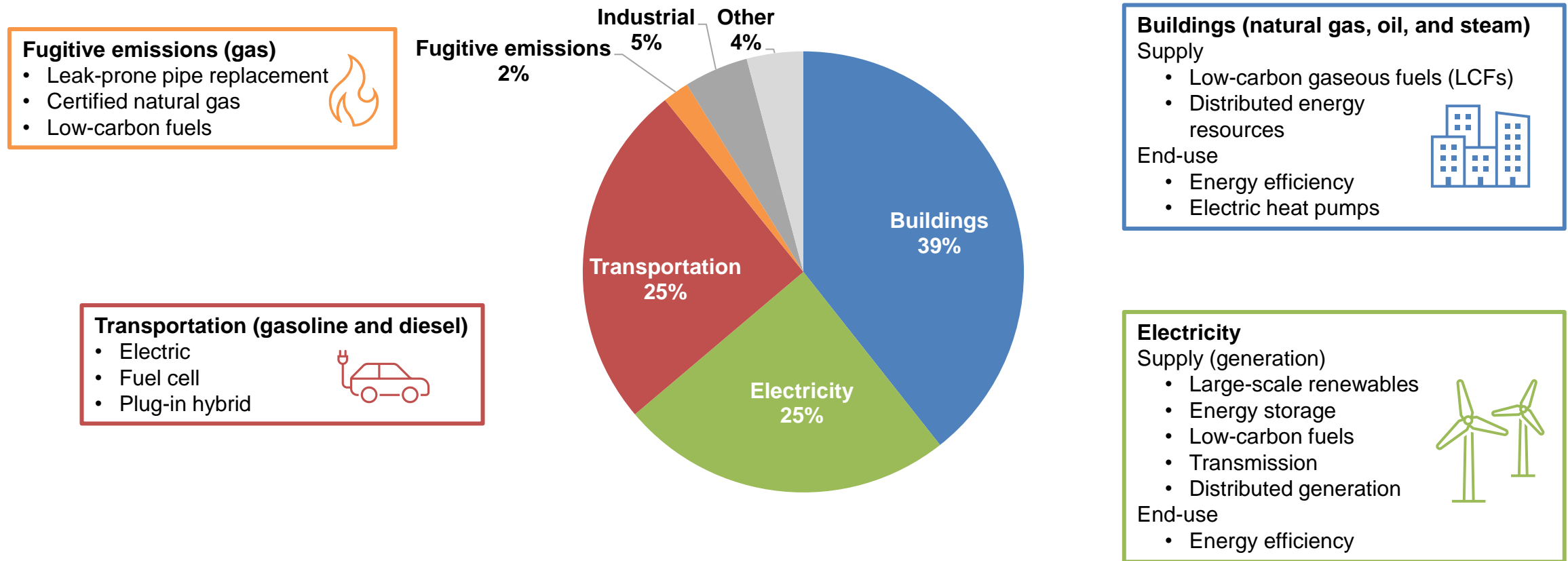
## • Future

- Universal access to **clean** energy that is:
  - Safe
  - Reliable
  - **Resilient (able to prevent, mitigate, and recover from events)**
- Provide **positive societal value**
  - Balance direct consumer costs and societal benefits
  - Focus on environmental justice (EJ)
- Engineering and operations focus (operational excellence)
- Customer engagement
- **Market enablement**

**Bold** – changes in the role of the utilities

# 2020 GHG emissions (NYC, Westchester, O&R)

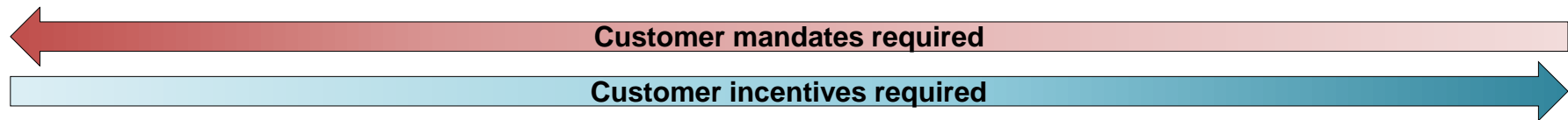
To achieve NYS and NYC clean energy goals, our utilities need to enable a fundamental change in how energy is sourced and consumed in our service territories; several energy solutions exist to deliver on net-zero GHG emissions by 2050



# Pathways to achieve net-zero GHG emissions by 2050

We have evaluated representative pathways that differ in level of electrification and low carbon fuels that capture possible outcomes to achieve policy goals

	Full Electrification	Hybrid Consumption
Description	<ul style="list-style-type: none"><li>Relies on existing technology solutions</li><li>Eliminates emissions in the buildings sector</li></ul>	<ul style="list-style-type: none"><li>Optimizes use of existing electric, gas and steam infrastructure</li><li>Mitigates customer complexity and disruption</li><li>Diversification of fuel facilitates reliability</li></ul>
Challenges	<ul style="list-style-type: none"><li>Requires building codes and standards that mandate building electrification</li><li>Requires emergence of long-duration battery storage</li></ul>	<ul style="list-style-type: none"><li>Requires significant breakthrough in deployment of scalable low carbon fuels</li></ul>



# Strategy for gas

Our gas utilities will enable a cost-effective clean energy transition by reducing sales, using the gas infrastructure to deliver LCFs, and ensuring the economic viability of the business through timely recovery of investments

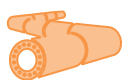
## Prepare customers for clean energy transition



Eliminate new gas customer connections



Drive growth in electrification of heating and energy efficiency



Provide LCFs to buildings that are difficult-to-electrify

## Facilitate supply transformation



Advocate for use and procurement of LCFs



Transmit LCFs for balancing generation



Reduce fugitive methane emissions

## Focus on the economic viability of the gas business



Leverage non-pipeline alternatives



Focus on reducing rate base growth



Seek timely recovery of investments

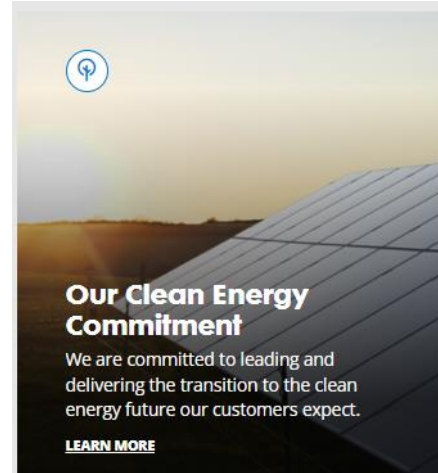
Seek regulatory and legislative support to enable gas strategy

The clean energy transition will result in a significant decline in gas sales, and require a reduction in system investment

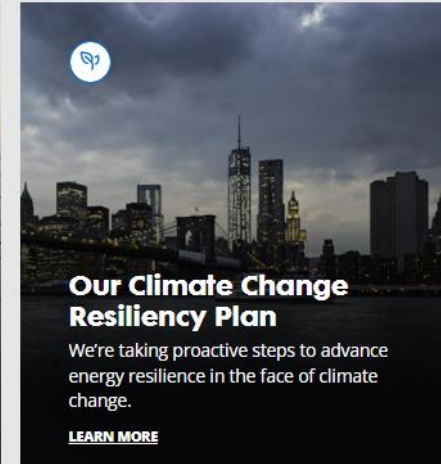
# Our Long Range Plans

## Our Energy Vision

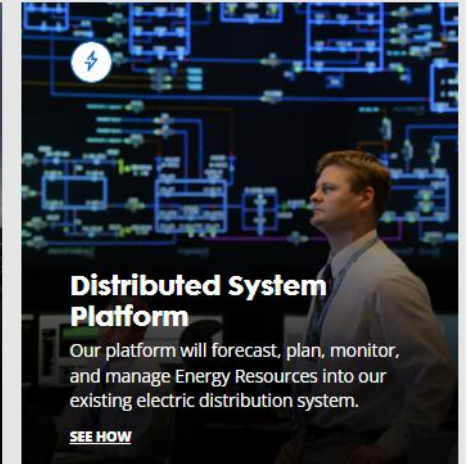
We will take a leadership role in the delivery of a clean energy future for our customers. We will do that by investing in, building, and operating reliable, resilient, and innovative energy infrastructure, advancing electrification of heating and transportation, and aggressively transitioning away from fossil fuels to a net-zero economy by 2050.



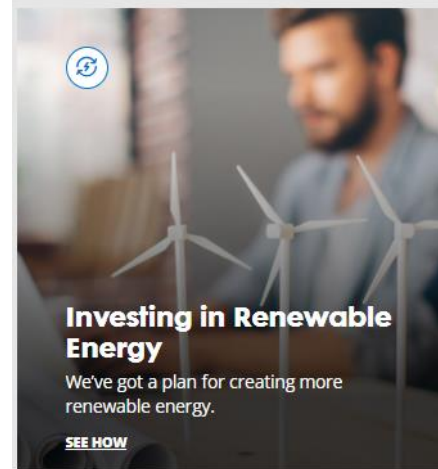
**Our Clean Energy Commitment**  
We are committed to leading and delivering the transition to the clean energy future our customers expect.  
[LEARN MORE](#)



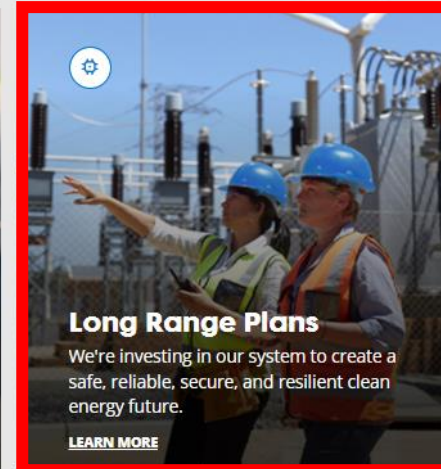
**Our Climate Change Resiliency Plan**  
We're taking proactive steps to advance energy resiliency in the face of climate change.  
[LEARN MORE](#)



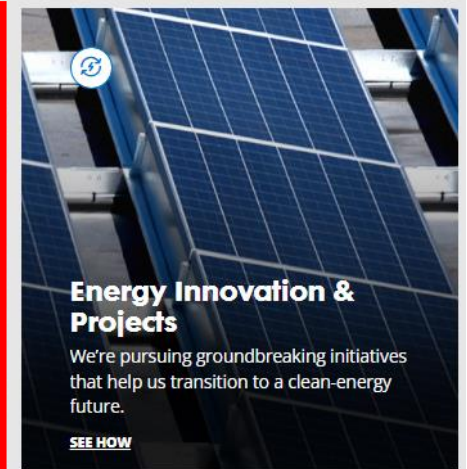
**Distributed System Platform**  
Our platform will forecast, plan, monitor, and manage Energy Resources into our existing electric distribution system.  
[SEE HOW](#)



**Investing in Renewable Energy**  
We've got a plan for creating more renewable energy.  
[SEE HOW](#)



**Long Range Plans**  
We're investing in our system to create a safe, reliable, secure, and resilient clean energy future.  
[LEARN MORE](#)



**Energy Innovation & Projects**  
We're pursuing groundbreaking initiatives that help us transition to a clean-energy future.  
[SEE HOW](#)

<https://www.coned.com/en/our-energy-future/our-energy-vision/long-range-plans>