

# Gas System Long-Term Plan

Information Session 12.19.23

Case Nos.

20-G-0131 & 23-G-0676



# Logistics and Background

James Keating  
Director, Gas Transformation and Planning



# Agenda

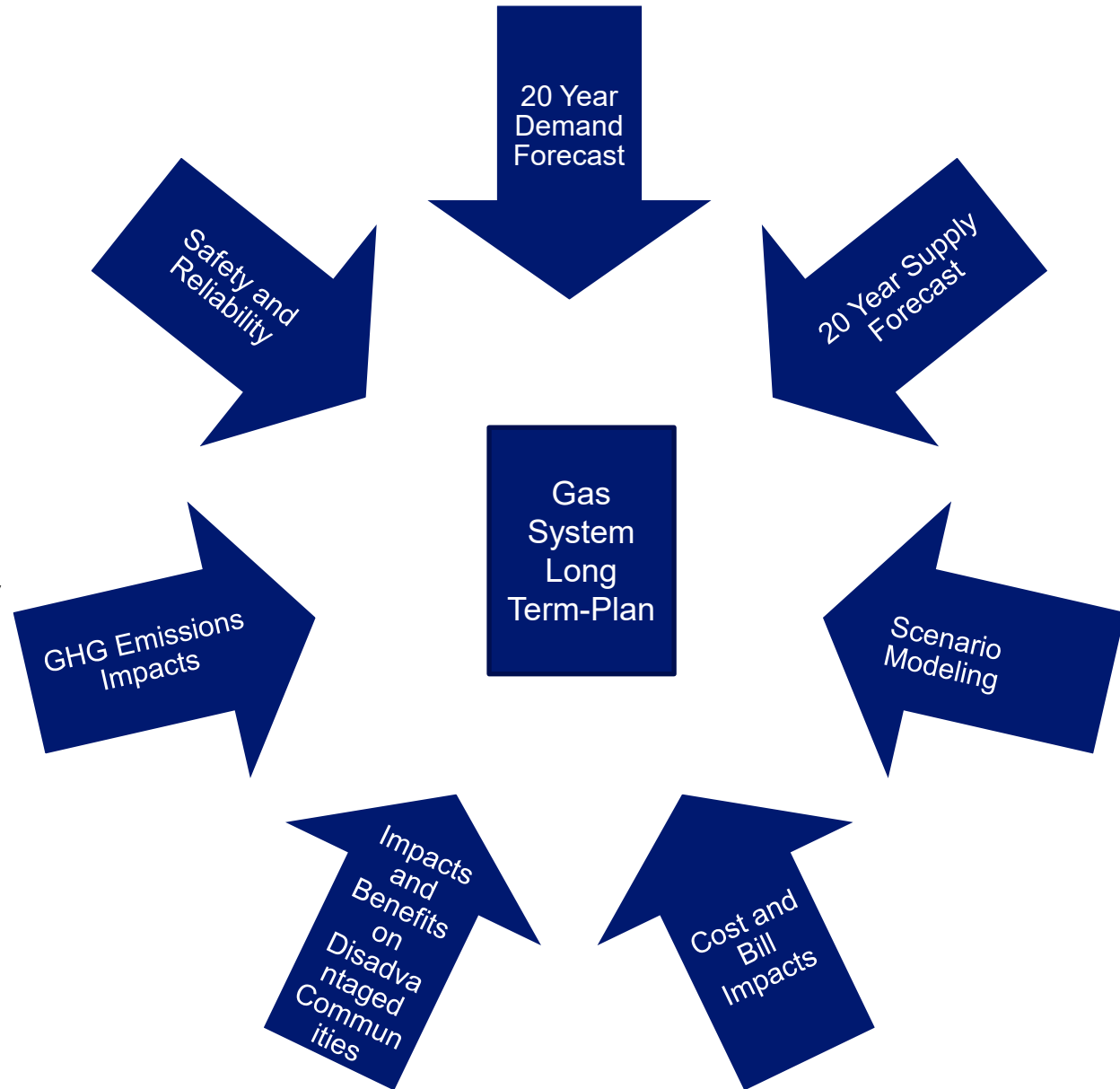
- Logistics and Background
- Introduction to Natural Gas Industry and Company Overview
- Customer Demographics, Usage Trends, Demand Forecasting
- Gas Supply Planning
- Gas Engineering
- Gas Operations
- Gas Planning
- Utility Emissions
- Demand Side Management
- Utility Thermal Energy Networks
- Q&A

# Meeting Logistics

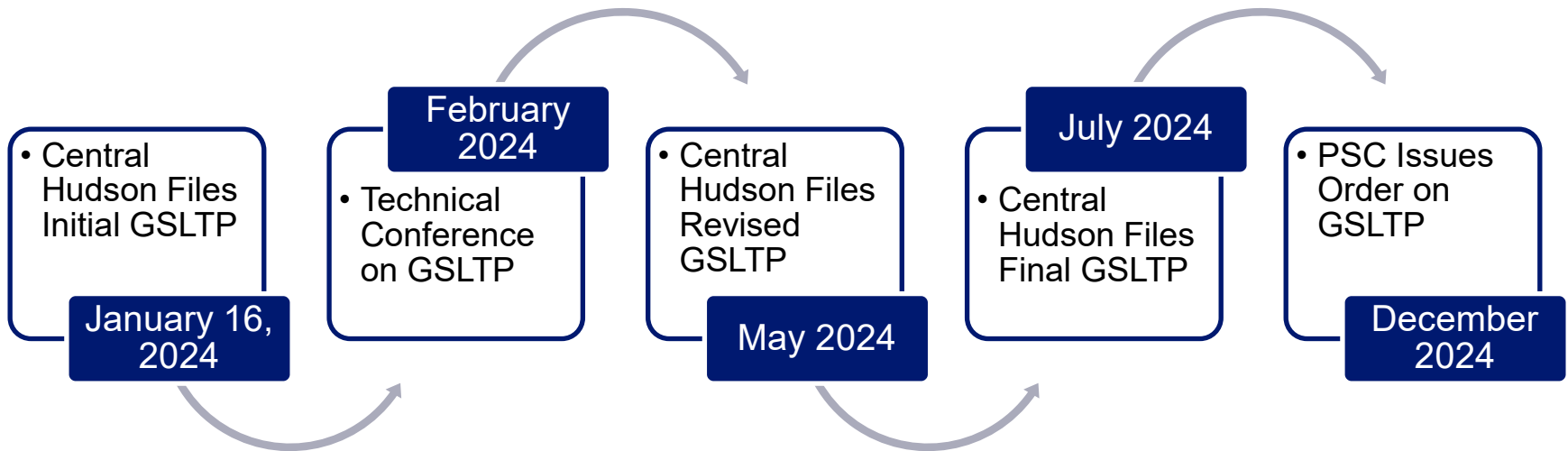
- Central Hudson Gas and Electric (CHG&E) is hosting this Information Session to share background information regarding the natural gas system. The aim of this afternoon's program is to enable stakeholders to effectively participate in the gas system long-term planning process.
- A Q&A will follow each 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).

# Gas Planning Proceeding

Adopts modernized long-term natural gas planning procedures to ensure that the State, customers, stakeholders, and all other interested entities can understand and engage in the future of natural gas infrastructure in the New York State.



# Process



# Central Hudson & Introduction to Natural Gas Industry

Eric Kiszkiel

Vice President, Gas Operations and Engineering



# About Central Hudson Gas & Electric Corp.

- Territory – 2,600 Square Miles
- Located in the Hudson Valley
  - Serve 8 Counties along Hudson River North of NYC to Albany Capital District
- 84,000 Gas Customers
- 309,000 Electric Customers





# Central Hudson Transmissions System

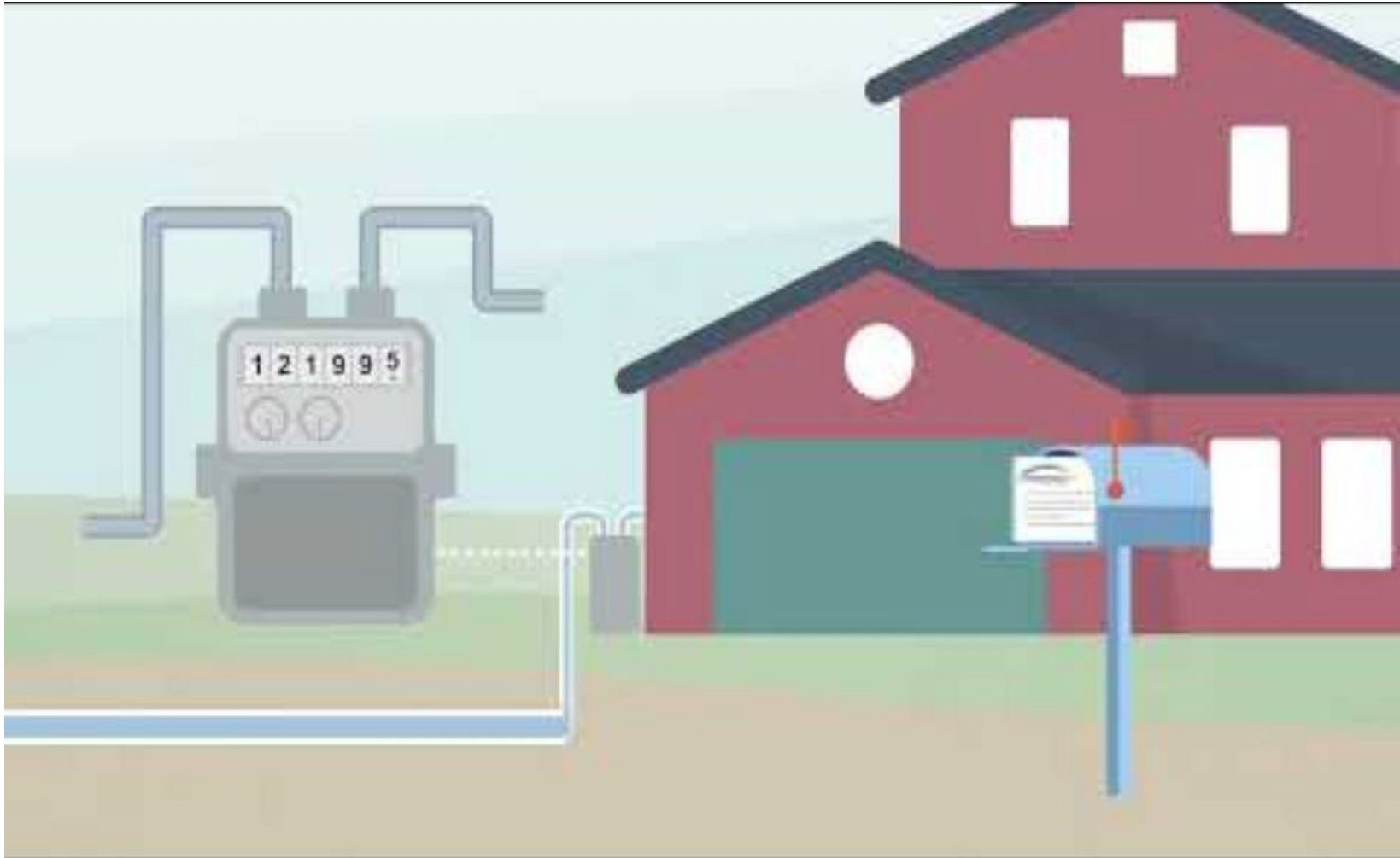
- Served by 4 Interstate Pipelines
- 4 Gate Stations
- 162 Miles Transmission Pipe – Pressure 200-750 psig



# CH Pipeline System Characteristics

Miles of Transmission Main	162.37
Miles of Distribution Main	1318.7
Number of Gas Services	66,186
Number of Gate Stations	4
Number of Regulator Stations	136

# CHGE Gas System Video



# Properties of Natural Gas

- Tasteless
- Colorless
- Non-Toxic
- Lighter than air
- Combustible
- Odorless – Until we add Odorant!

# Composition of Natural Gas

- **Methane** → 85-95%
- Other Hydrocarbons → 3-7%
  - **Ethane**
  - Propane
  - Butane
  - Pentane (plus)
- Non-Hydrocarbons → 2-8%
  - Nitrogen
  - Carbon Dioxide

# Odorant – The Smelly Stuff!

- Odorant (Mercaptan) is an organic sulfur compound
  - Added to natural gas to give it an identifiable odor (customer recognition)
  - Detectable at 0.5% gas in air (equivalent to 10% LEL)



# Gas Odor Hotline

- Direct: 1-800-942-8274
- 911



**Think  
You  
Smell  
Gas?**



**STOP**  
what you are doing



**GO**  
outside  
immediately



**LET US KNOW**  
by calling our  
gas odor hotline  
(800) 942-8274 or 9-1-1

# Customer Demographics, Usage Trends and Demand Forecasting

Stacy Powers

Director – Costs, Rates & Forecasts



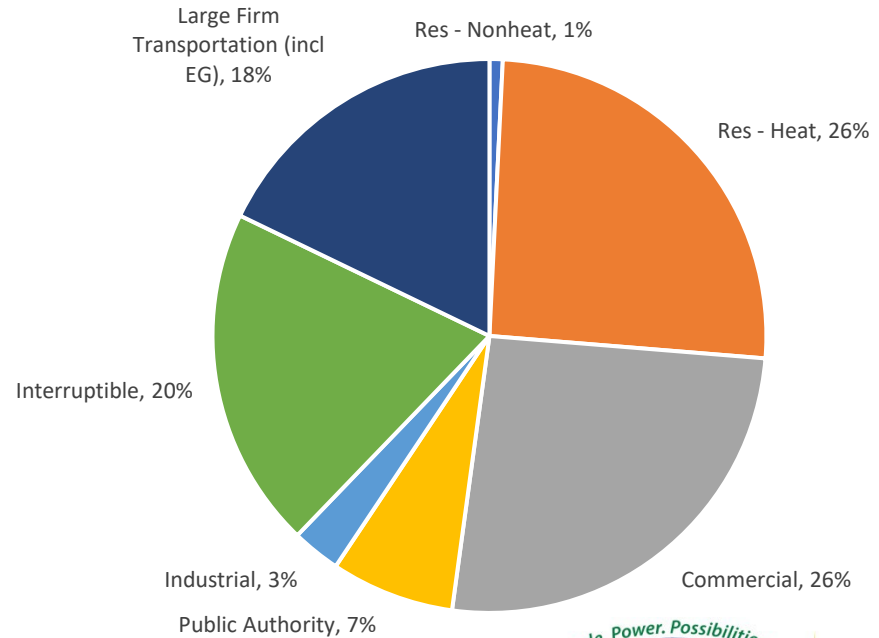


# Who Are Our Customers in New York

## 2022 Gas Customers

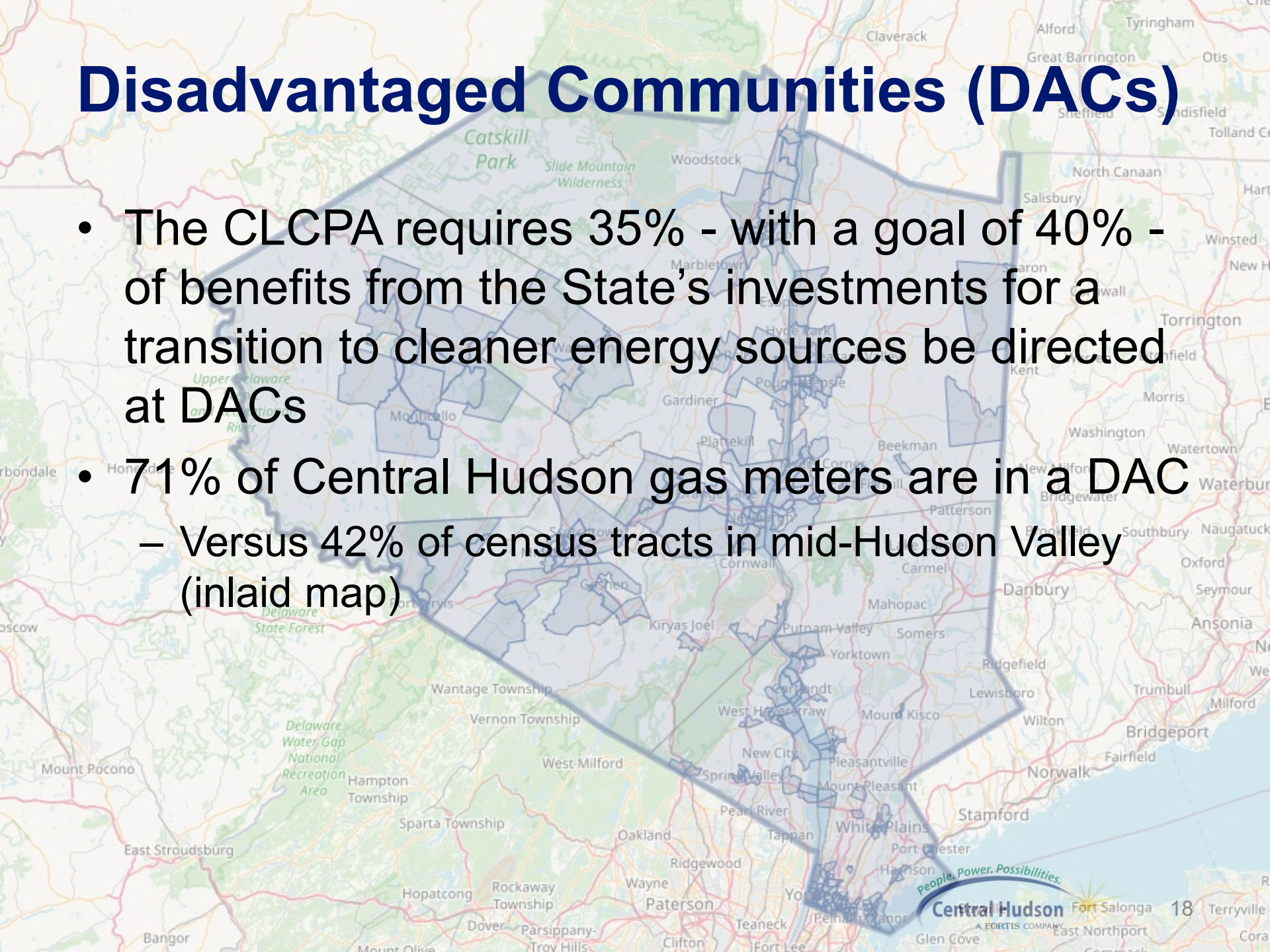
Residential - Nonheat	7,024
Residential - Heat	67,427
Commercial	11,577
Public Authority	905
Industrial	309
Interruptible	33
Large Firm Transportation (incl EG)	<u>5</u>
	87,280

2022 Gas Sales  
21,147,870 Mcf



# Disadvantaged Communities (DACs)

- The CLCPA requires 35% - with a goal of 40% - of benefits from the State's investments for a transition to cleaner energy sources be directed at DACs
- 71% of Central Hudson gas meters are in a DAC
  - Versus 42% of census tracts in mid-Hudson Valley (inlaid map)



# Energy Affordability Program (EAP)

- EAP bill discounts provided to enrolled customers
- Customers qualify through:
  - A HEAP payment applied to their account
  - Account is file matched with OTDA
  - Customer self-certifies
- ~19,500 customers; 6,500 gas accounts
- \$7.3 M in electric discounts; \$3.7 M in gas discounts provided (12 months ending November 2023)

# Our Residential Customers

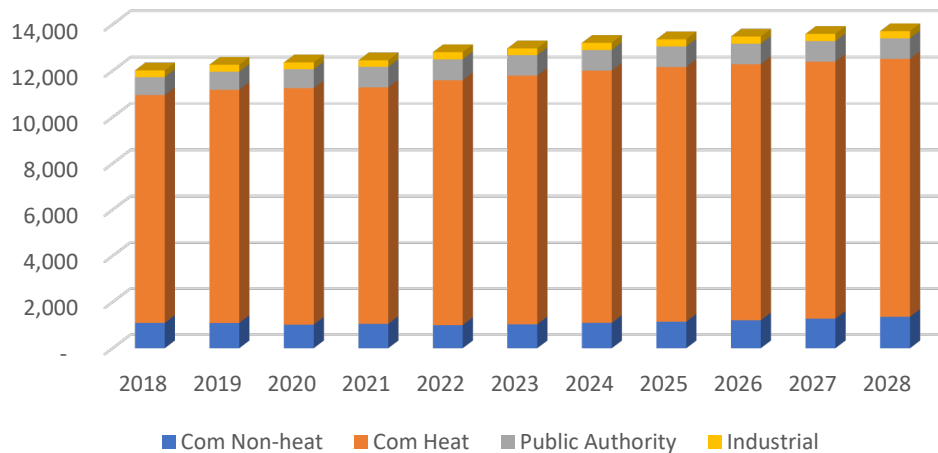
- 9% of residential customers do not use gas for heating
- By 2028 non-heating residential customers grows to 14% driven by electrification (heat pumps)



# Our C&I Customers

- Top 20 gas customers contribute to 60% of annual throughput (inclusive of interruptible, electric generators)

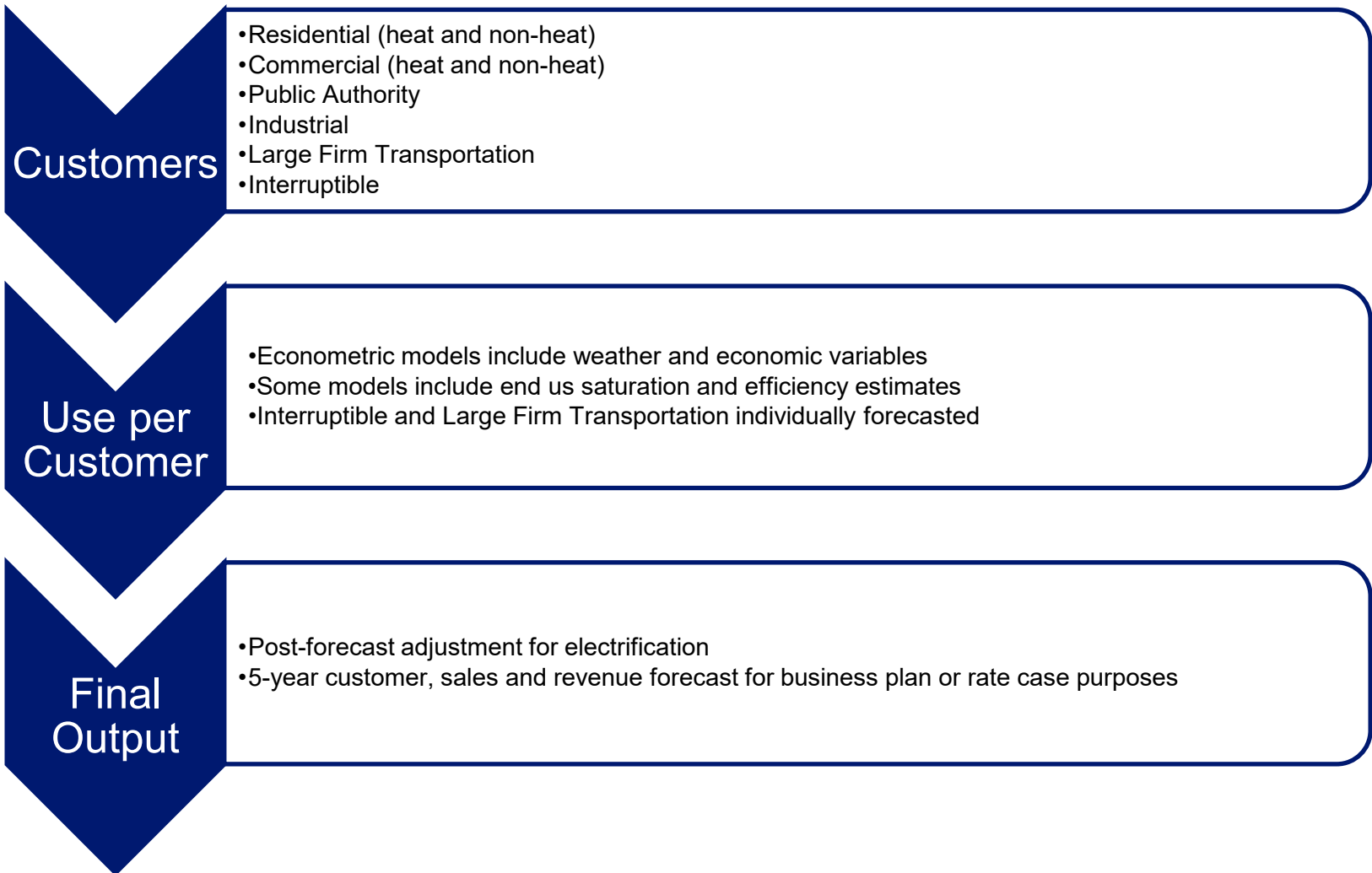
Non-residential Customers



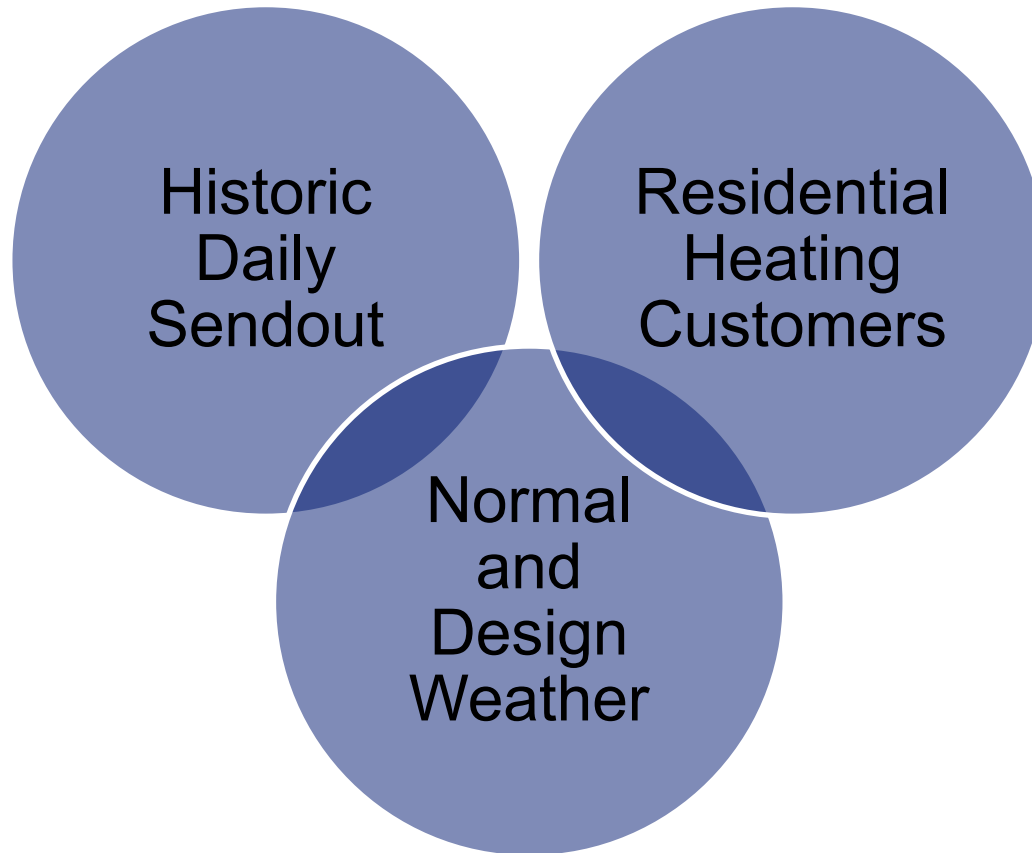
Class	Mcf/year
Com Non-heat	560
Com Heat	460
Public Authority	1,680
Industrial	1,940



# Volume Forecasting Methodology



# Peak Forecasting Methodology



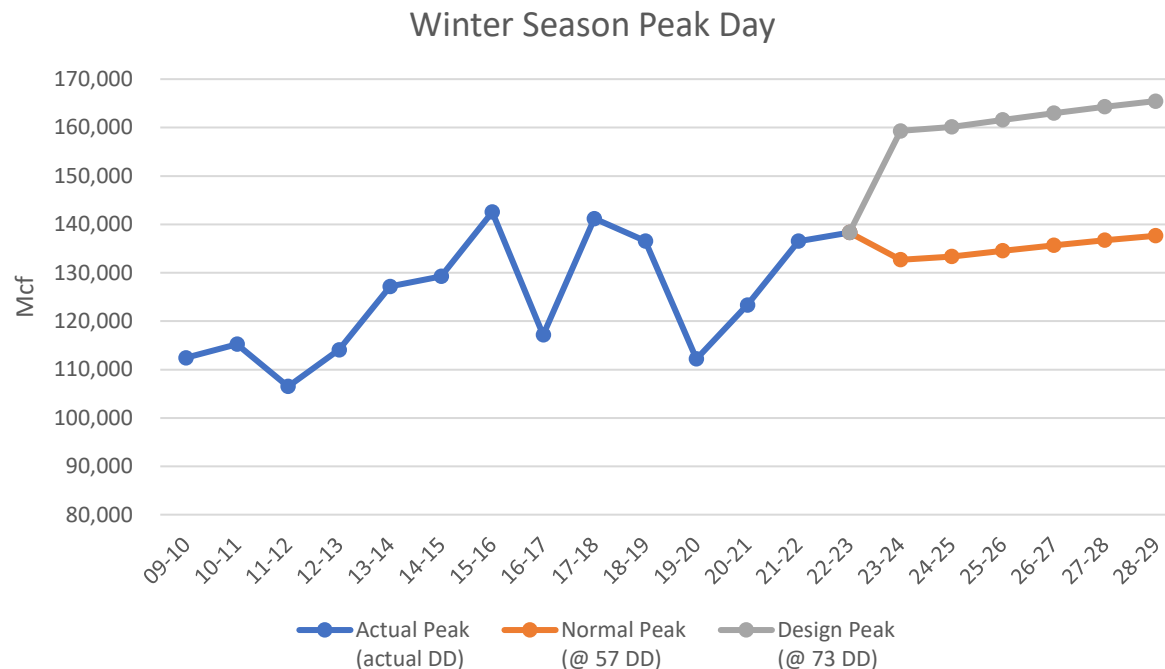
# Peak Forecasting Detail

- Firm

- Sales
- Transportation
  - Large Firm Transportation

- Non-Firm

- Sales
- Transportation





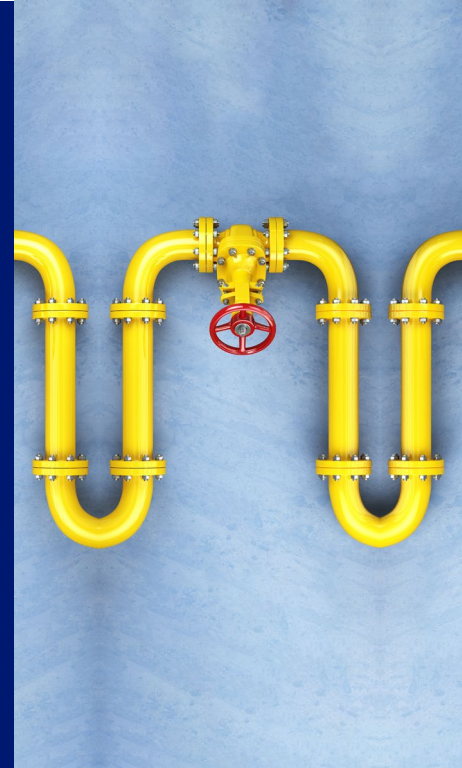
# Weather Assumptions

- Weather measured at Dutchess County Airport
- Volume forecast
  - 10 year normal
  - 30 year normal for Winter Supply Review
- Peak forecast
  - Normal – 57HDD with prior day of 51HDD
  - Design – 73HDD with prior day of 45HDD

# Gas Supply, Procurement, Transportation, and Storage

Jeffrey May

Manager – Energy Resources



# Planning: Serving Peak Demand

## Design Day Forecasting

- Annual Planning
  - Review of 12 to 15-month sales & demand forecasts
    - Upcoming winter supply requirements
    - Hedge Plan
  - Review 2 to 5-year sales & demand forecasts
    - Firm transportation or storage requirements



# Planning: Serving Peak Demand

## Firm Transportation & Storage Capacity

- Central Hudson manages a single, consolidated portfolio
- Contracts serve up to Design Day requirements plus a small reliability reserve margin
  - Long-term transportation and storage
  - Intermediate-term peaking services



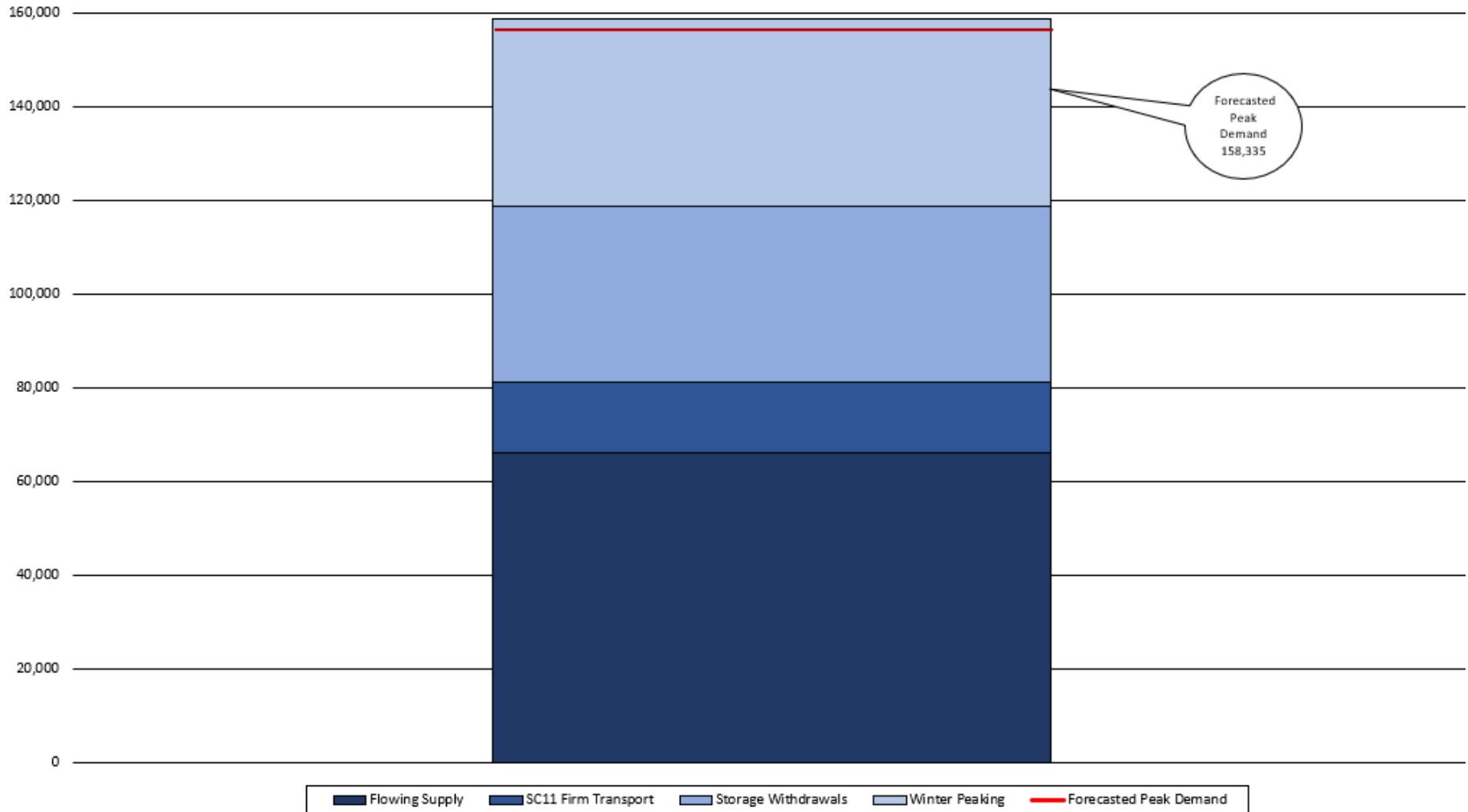
# Planning: Serving Peak Demand

## Commodity Procurement

- Central Hudson's portfolio is managed as a whole, aggregate system
- Full-service commodity customers
  - seasonal base, storage, term peaking, daily spot, balancing services
  - Diversity of liquid market hubs; Domestic and Canadian
- Delivery service customers
  - storage (WBS), balancing services
- Responsibly Sourced, Renewable, Compressed, and Liquefied Natural Gas



# Winter 2022-23 Forecast Design Day Demand and Supply



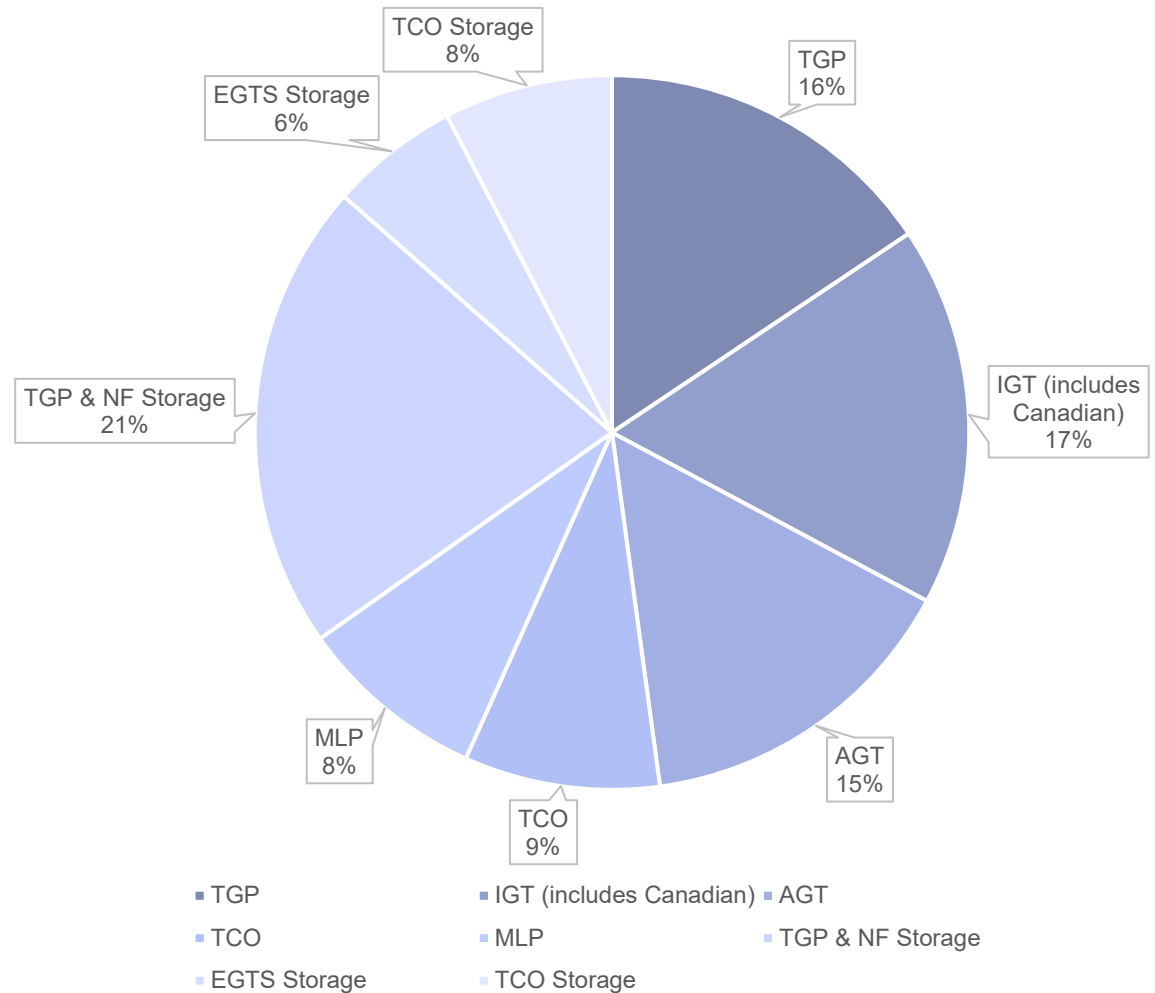
# Firm Transportation and Storage Capacity

## • Firm Pipeline Transportation Capacity

- Millennium Pipeline
- Columbia Gas Transmission
- Tennessee Gas Pipeline
- Iroquois Gas Transmission
- Algonquin Gas Transmission

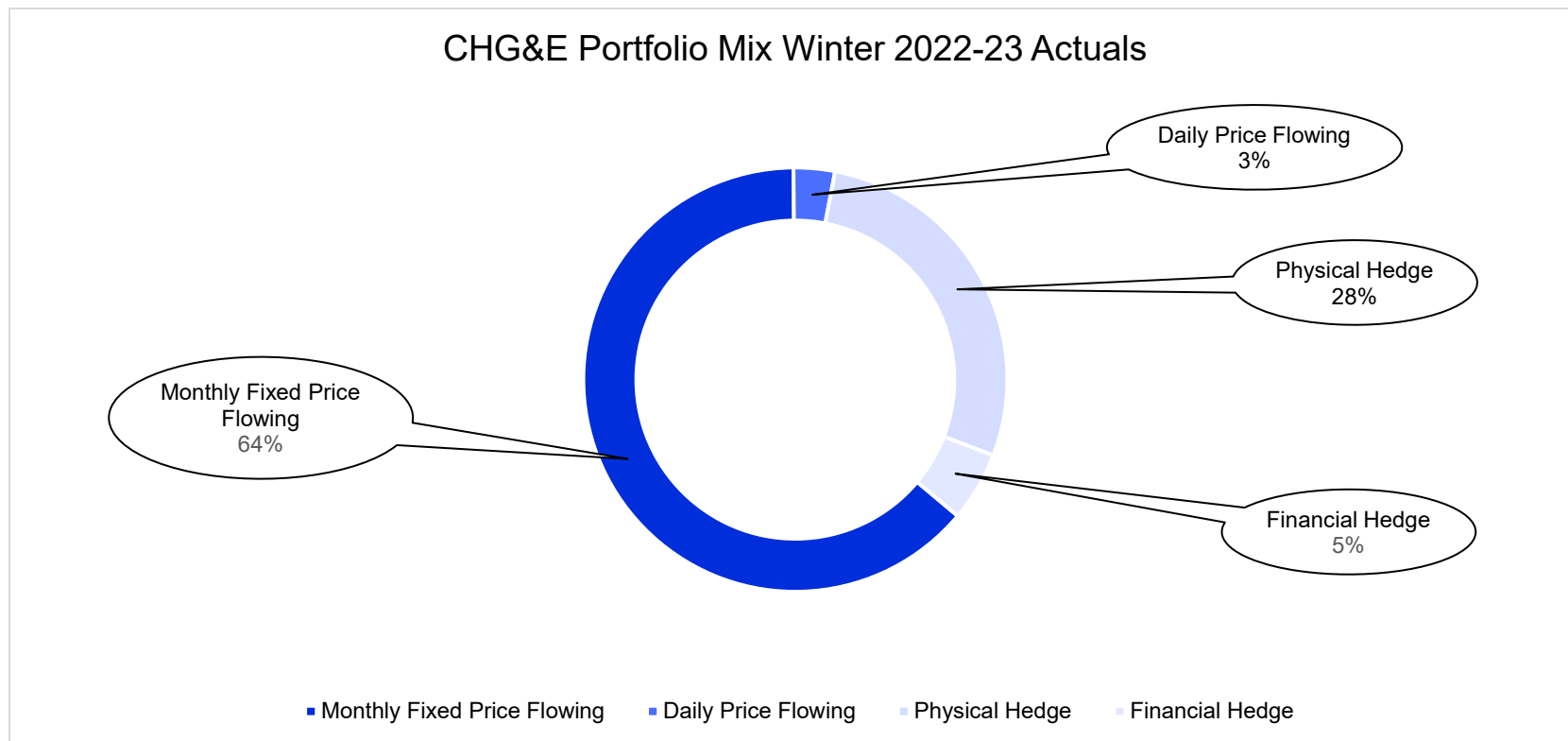
## • Firm Storage Capacity with Transportation Service

- Eastern Gas Transmission and Storage
- Columbia Gas Transmission – Columbia Storage
- Tennessee Gas Pipeline – Tennessee Storage and National Fuel Storage



# Dampening Price Volatility

- The Company seeks to hedge 40% of firm winter requirements each year
- Storage Injections in the summer are delivered to city gate stations in winter
- Financial futures and transportation basis fix monthly flowing base supplies
- Winter weather financial instrument





# Reliability Through Supply Diversification and Flexibility

## Least Cost Approach to Supply Procurement



### Firm Commodity Procurement

#### Market Area Strategy

- Aligned with transportation assets
- Robust Marcellus and Canadian supplies
- Market hub varies based on transportation path / city gate

#### Least Cost Dispatch

- Lowest cost supply delivered first
- Market analysis performed daily
- Least cost, most reliable supply sought

#### Portfolio Mix

- Monthly priced with fixed basis
- Storage
- Peaking
- Daily Spot

#### Price Volatility Mitigation

- Financial Hedges
- Storage
- Daily market analysis
- Asset Management Agreement

# Gas Engineering

Joseph Koberger  
Director of Gas Engineering



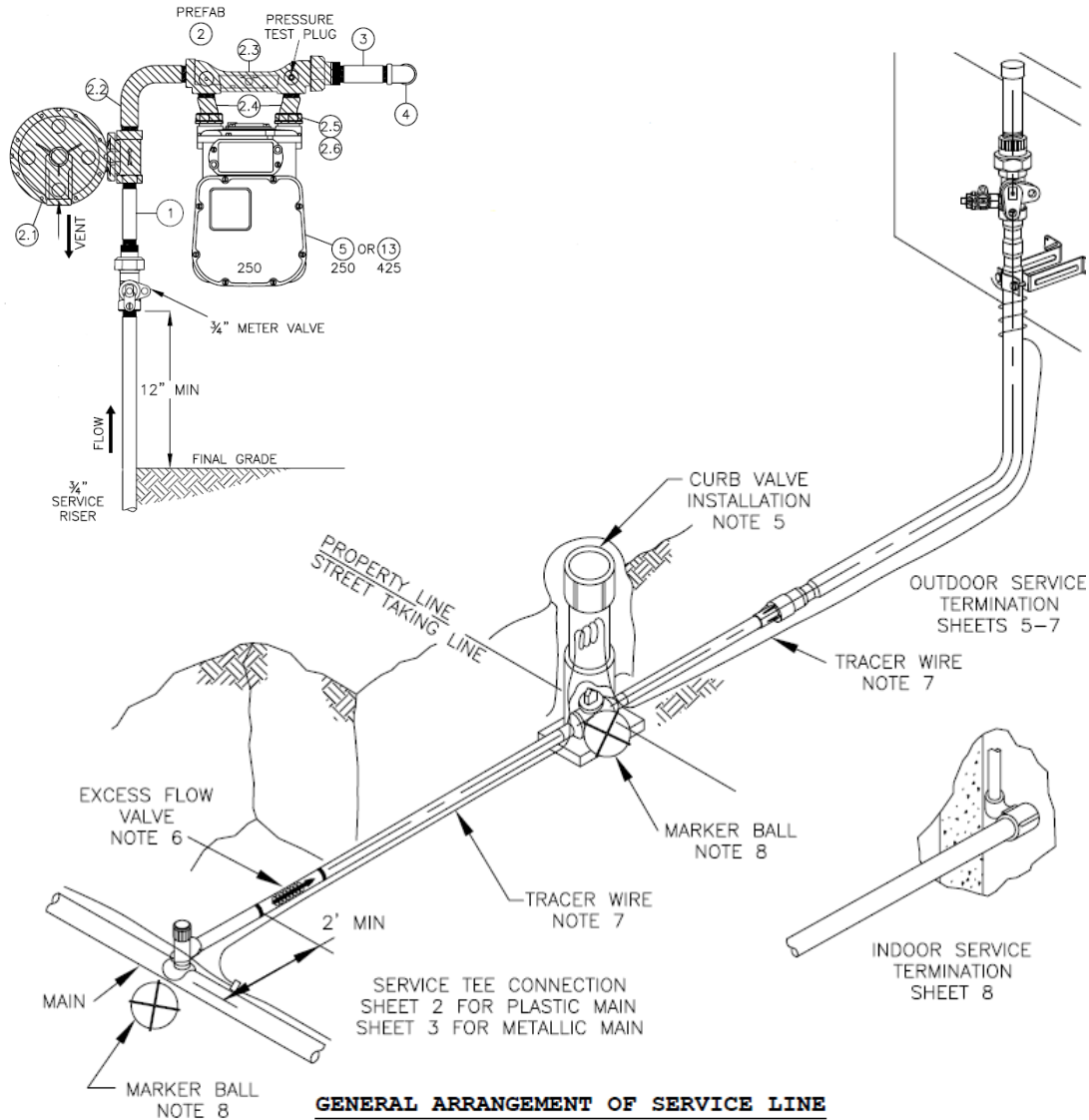
# Gas Engineering Overview

Design and plan safe and reliable natural gas system

Comprised of three areas:

- 1) Gas Transmission, Regulator Station and Electric Production
  - Project manage capital construction projects.
- 2) Gas Standards and Integrity Management
  - Responsibility for procedures, construction standards, materials
  - Ensure pipeline integrity
- 3) Gas Operations Engineers
  - Provides local district support

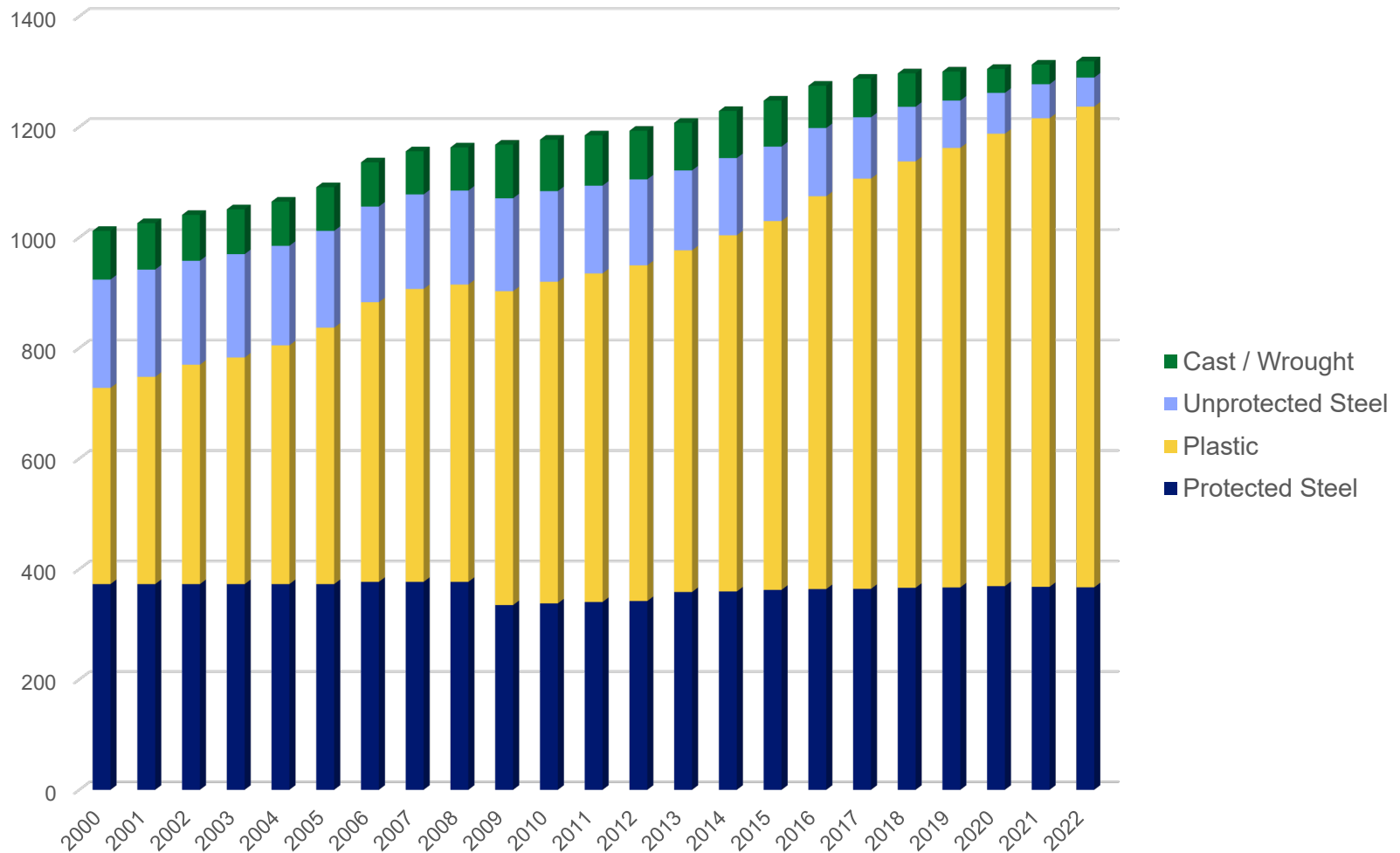
# What does a Service Look like?



**GENERAL ARRANGEMENT OF SERVICE LINE**

# Pipeline System Characteristics

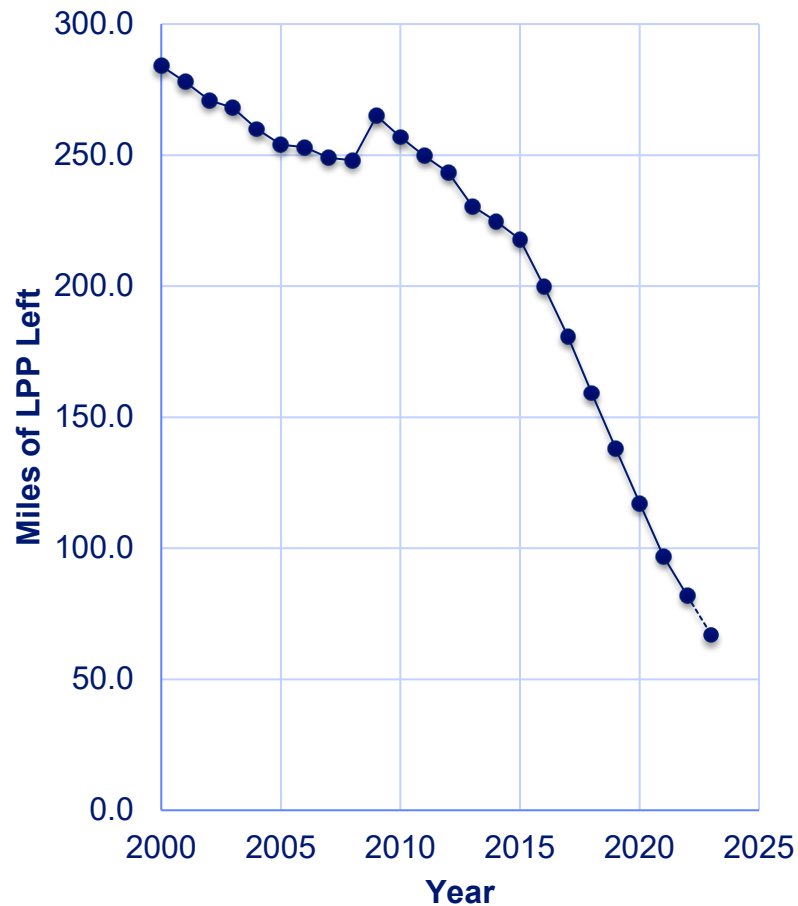
## Central Hudson Miles of Mains



# When to Replace Pipes?

- **Capital Budget Development**
  - Utilize a software “Main Replacement Prioritization” (MRP)
  - Calculates risk and condition scores associated with each pipe segment based on:
    - Leak History, Pipeline Characteristics, Building Proximity, etc.
  - Team of SME’s review and target highest risk pipes to replace. Team develops a 5-year Capital Plan based on data and Operational input
- **Operations** – Work closely with Local Municipalities to coordinate pipeline replacement projects with paving and beautification projects
- **Gas Planning** – Proactively model and study gas systems and determine if any pipe replacements are needed to support pipeline capacity

# Leak Prone Pipe (LPP) Replacement Program



- Central Hudson's current largest capital investment program
- Current target 15 miles of LPP per year
- At end of 2023, remaining Mileage will be 66.9 miles

# Safety Programs at Central Hudson

- TIMP
- DIMP
- Regulator Station Replacements
- Hands-On First Responder Training
- Leak Prone Pipe Replacement Program





# Efforts to Reduce Methane Emissions



- Methane Recapture on Transmission Projects
- Optimizing Gate Station Equipment
- Leak Prone Pipe Elimination Program
- Satellite Methane Detections

# Gas Operations

Brianna Peak  
Manager, Gas Operations and  
Engineering



# Gas Operations Overview

Operate a safe and reliable gas system for our customers

- Perform inspection and repairs for the safe operation of the natural gas system
- Construct new pipelines, replace aging infrastructure, and retire unutilized pipelines
- Respond to Gas Emergencies
- Manage workforce comprised of contractors and IBEW Local 320 Workforce
- Train and Develop internal resources
- Manage Pipeline Safety Programs and Personal Safety initiatives

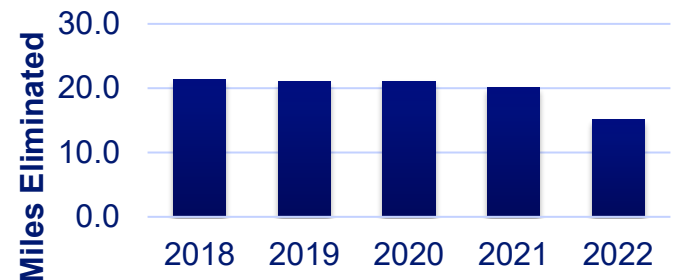
# Leak Prone Pipe (LPP) Replacement Program

- Work with Engineering and Planning department to execute projects
- LPP projects are also known as Distribution Improvement Projects (DIPs) ranging in size from 0.5 to 3 miles projects
- Modernized materials increase safety and reliability!
- Over 85% of Budget directly benefits Disadvantage Communities
- Work closely with Municipalities to replace aging infrastructure before or in conjunction with City projects



*For more info: Visit our Youtube Channel!*

## Leak Prone Pipe Miles Eliminated

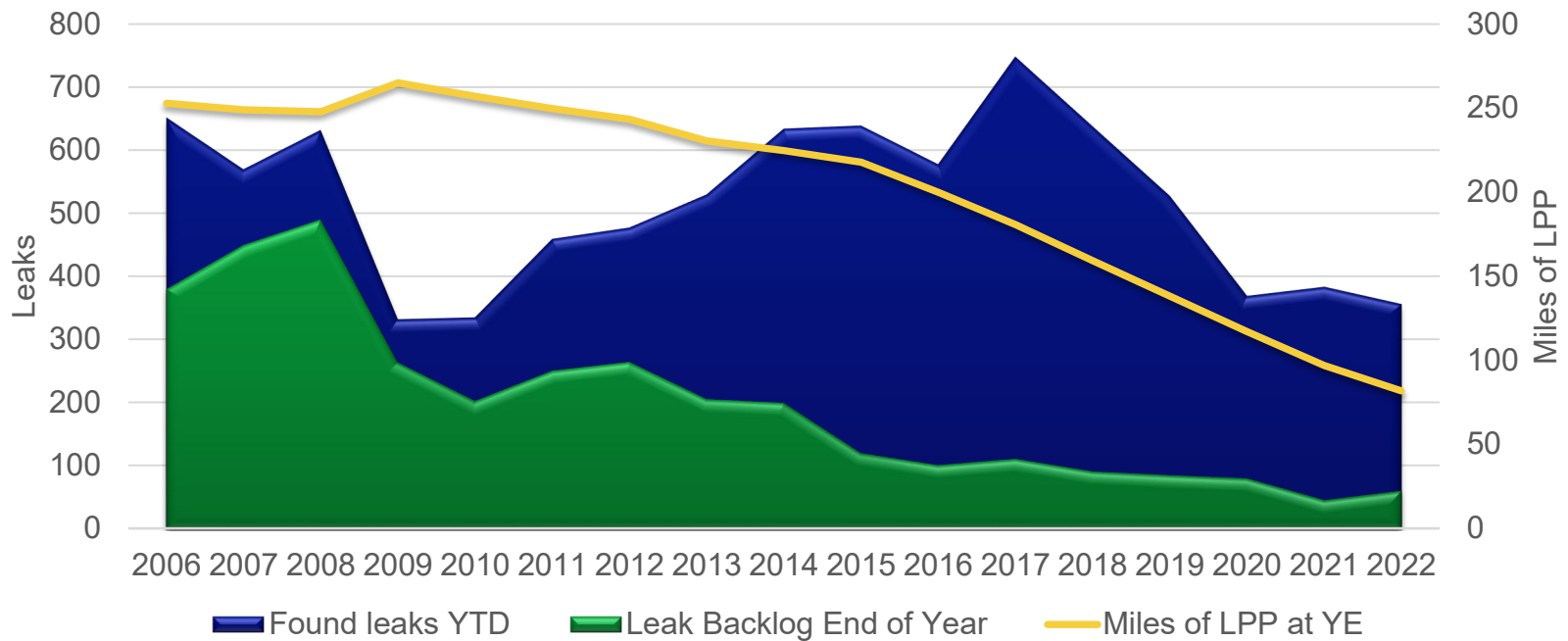




# LPP Video



# LPP Program Enhances Safety!



# Gas Leak Backlog

- Utilize LPP projects to replacing aging infrastructure before a leak is detected
- Targeted leak repairs throughout the year
- Damage Prevention efforts

	2018	2019	2020	2021	2022
Total Leak Back Log	91	87	80	47	63
Hazardous (Type 2/2As) Leak Backlog	6	1	8	1	3

# Improved Safety and Emission Reductions Through Enhanced Leak Repair Goals

To measure leak repairs, the Company developed internal KPIs that go beyond code requirements. The Company measures:

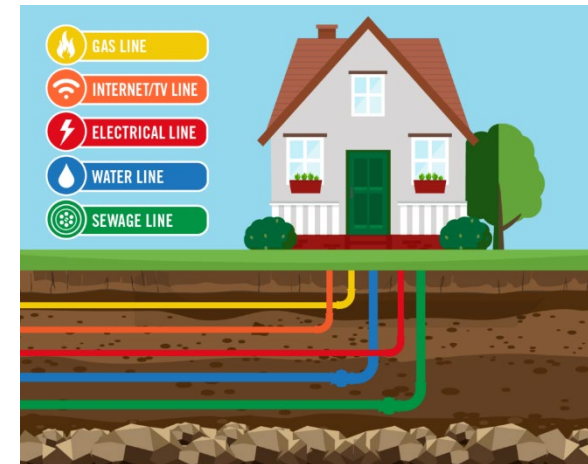
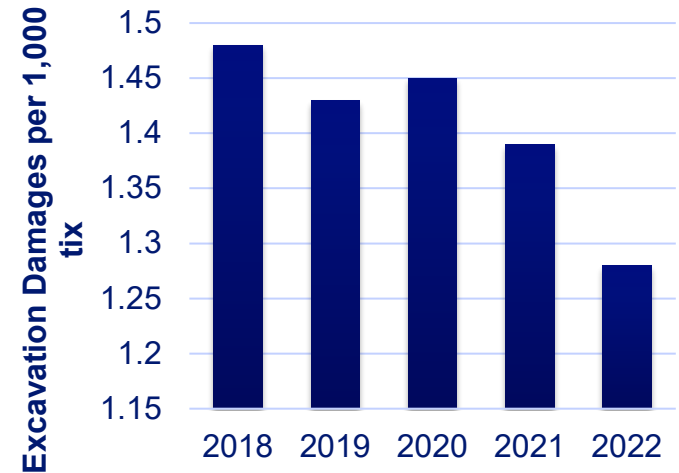
- The overall Leak Repair Success rates
- The percentage of All leaks repaired within 60 days of discovery
- The percentage of Type 2/2As repaired within 14 days and 28 days of discovery



# Damage Prevention Program

- Damage Patrollers provide enhanced education and outreach at jobsites
- Partner with Hudson Valley Damage Prevention Council
- Present at various UDigNY events
- Encourage nondestructive digging methods with internal and contract resources

## Gas Excavation Damages



# Damage Prevention – Central Hudson



# Emergency Response



Central Hudson What is that rotten egg smell?

**mercaptan**

Natural gas is colorless and odorless, so an odorant called **mercaptan**, which has a rotten egg smell, is added for easier detection in the event of a gas leak.

Central Hudson  
<https://www.cenhud.com> › my-energy › natural-gas

Natural Gas Safety - Central Hudson

**Think You Smell Gas?**

- STOP**  
STOP what you are doing
- GO**  
GO outside immediately
- LET US KNOW**  
LET US KNOW by calling our gas odor hotline (800) 942-8274 or 9-1-1

Emergency Response	2022 YTD Final	Target
< 30 minutes	85.6%	>80%
< 45 minutes	99.4%	>90%
< 60 minutes	99.9%	>95%

# Additional Safety Initiatives

- LP pipe is leak surveyed on annual basis (exceeding Code requirements)
- Community First Responder Drills
- Grassroots Safety Team – Gas Operations
- Development of Pipeline Safety Management System (API 1173)



# Key Concepts in Gas Planning

Dean Kane  
Section Engineer, Gas Planning



# T&D Gas System Planning Functions

Model System infrastructure utilizing Flow Modeling Software

Perform flow, area and integrity studies

Support Main Replacement Program (MRP)

Support Sizing Design for Distribution Improvement Projects

Complete Engineering Requests

Review Firm verse Interruptible Customer Decisions

Sizing of Main, Services, Meters

Regulator Sizing Requests

Modeling Existing and Future Loads

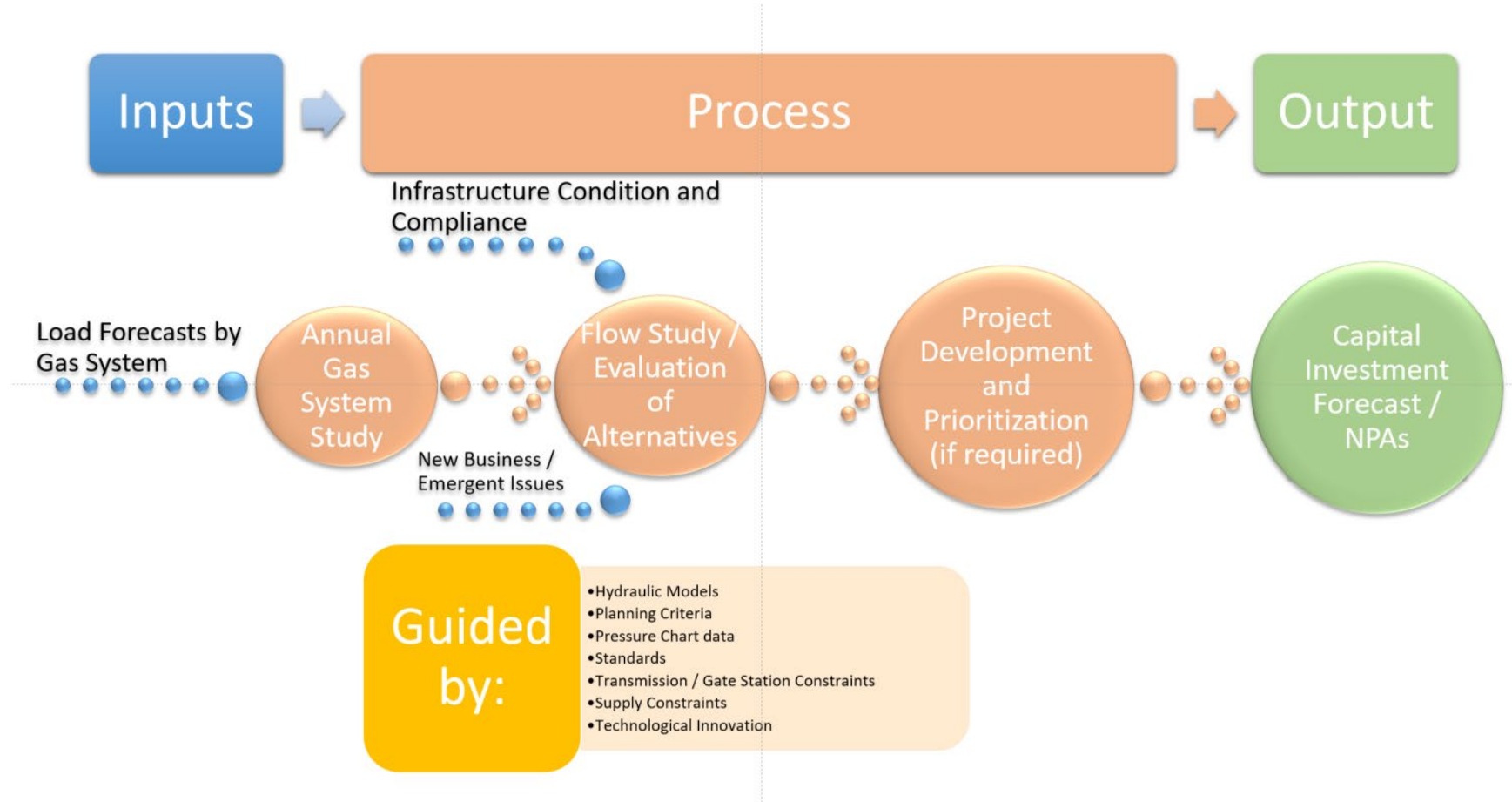
Verifying Loads

Engineering Support to Operations

Gas System Long-Term Plan

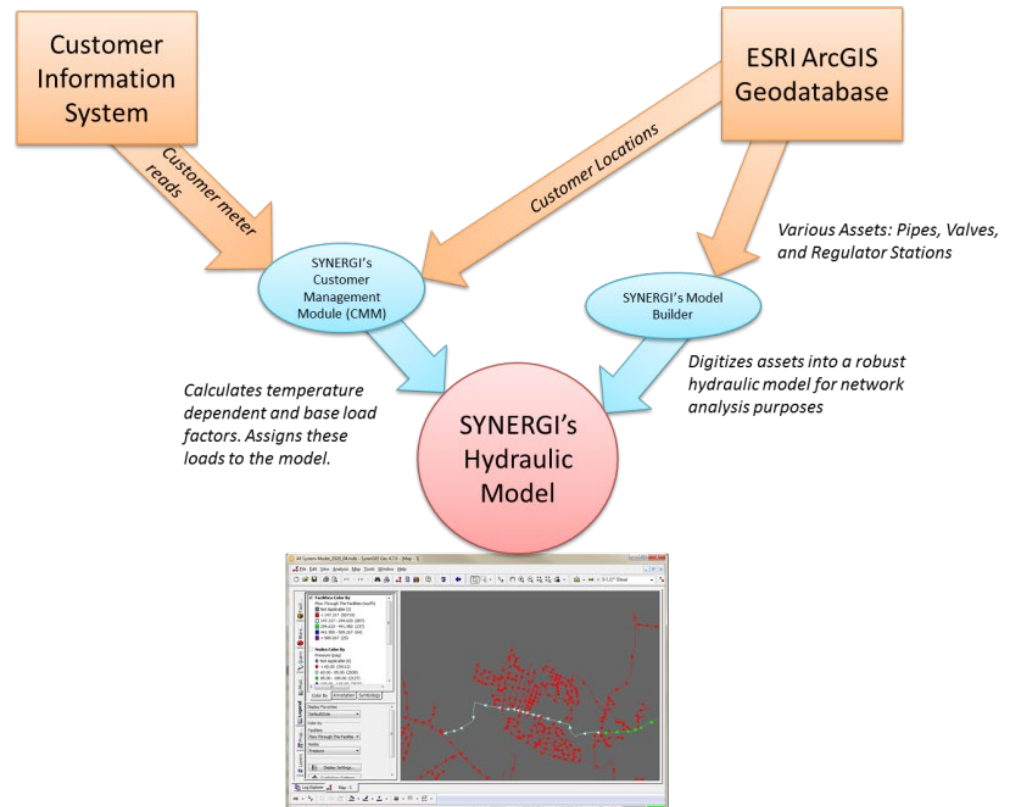


# T&D Gas System Planning Process



# Construction of a Hydraulic Model

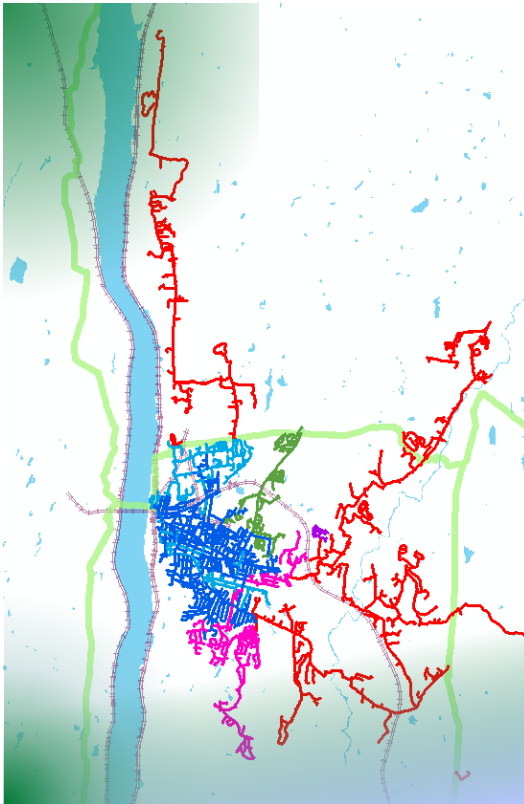
- To identify the potential Vulnerable Locations as well as analyze them in more detail, Central Hudson utilizes DNV GL's Synergi Gas hydraulic modelling software along with the software's extension modules: Customer Management Model (CMM) and Model builder in conjunction with the Company's own Customer Information Systems (meter readings, ArcGIS modeling, weather data) for building gas hydraulic models. The figure to the right provides a visual representation of how the source data is used to build a hydraulic model for network analysis purposes



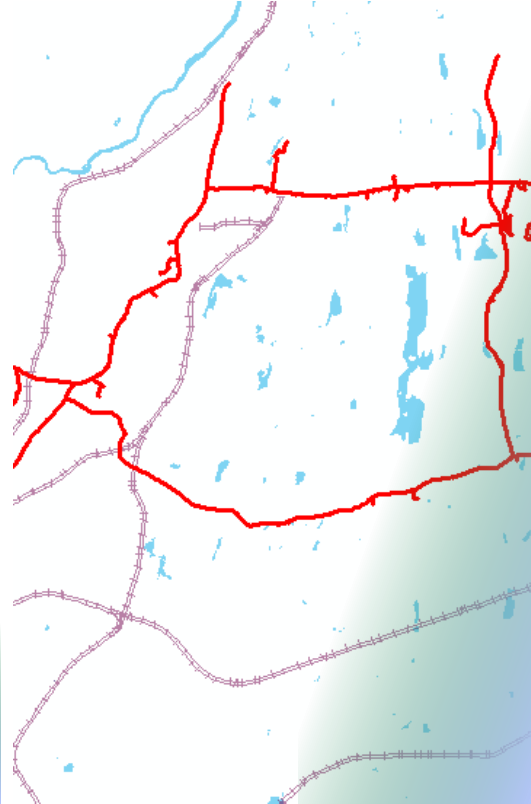


# System Studies

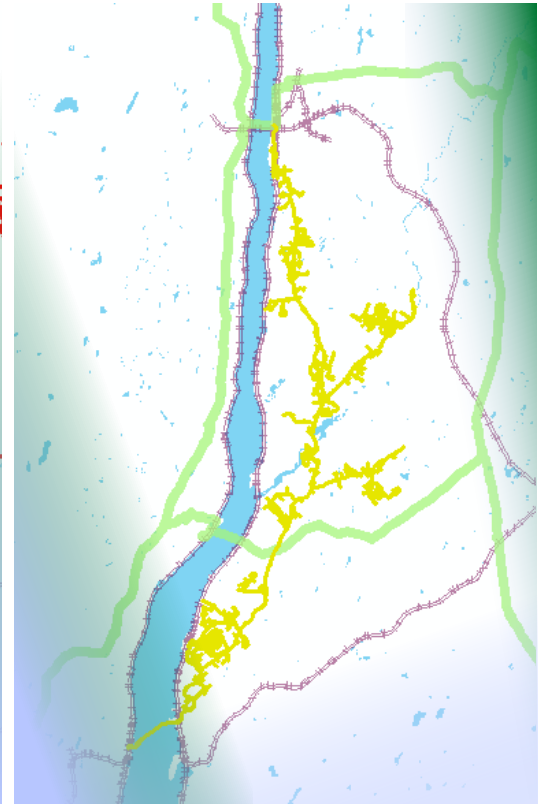
TVPV Line



CH Line



PN River Crossing



# 2020 Vulnerability Study

- As identified in the Company's July 17, 2020 Filing Central Hudson has identified (4) vulnerable locations as part of its total distribution system. Central Hudson's four vulnerable locations serve 3.4% of the customer base, Where necessary, Central Hudson has identified cost effective solutions to serve existing and new customers via load transfers, replacing leak prone pipe with pipe meeting current standards, and enhancing reliability through the looping of gas systems and NPA's
- HH continues to be monitored with no projects identified in the 2023 Rate Case Capital Budget
- The PN Line – This line is included in the 2023 rate case filing. More specifically, the 'PN Line' projects listed in the Company's Capital Budget will address the delivery reliability concerns
- The TVPV Line was previously addressed (Hartstone Reinforcement 2021)
- HM Line continues to be monitored with no projects identified in the 2023 Rate Case Capital Budget

Vulnerable Location	Municipality	Peak Day Usage (2020-2021)	Affected Customer Count (2020)	System Serving the Vulnerable Location	Downstream Implication
Location A	East Fishkill & Hopewell Junction, Dutchess County	131.506	1696	HH	No
Location B	Town of Poughkeepsie, Dutchess County	43.226	742	PN	No
Location C	Town of Poughkeepsie, Dutchess County	88.792	400	TVPV	Yes - SP
Location D	Highland Mills, Orange County	18.133	244	HM	No

# Utility Emissions

Karen Lo – Sustainability Coordinator



# Greenhouse Gas Classifications



## Scope 1

Direct Emissions  
from company  
owned and  
controlled  
resources

- Mains and Services
- Metering  
and Facility  
Heating
- Fleet Vehicles



## Scope 2

Indirect Emissions  
released from  
consumption of electricity

- Corporate and  
Field Offices
- Metering and  
Regulator  
Stations



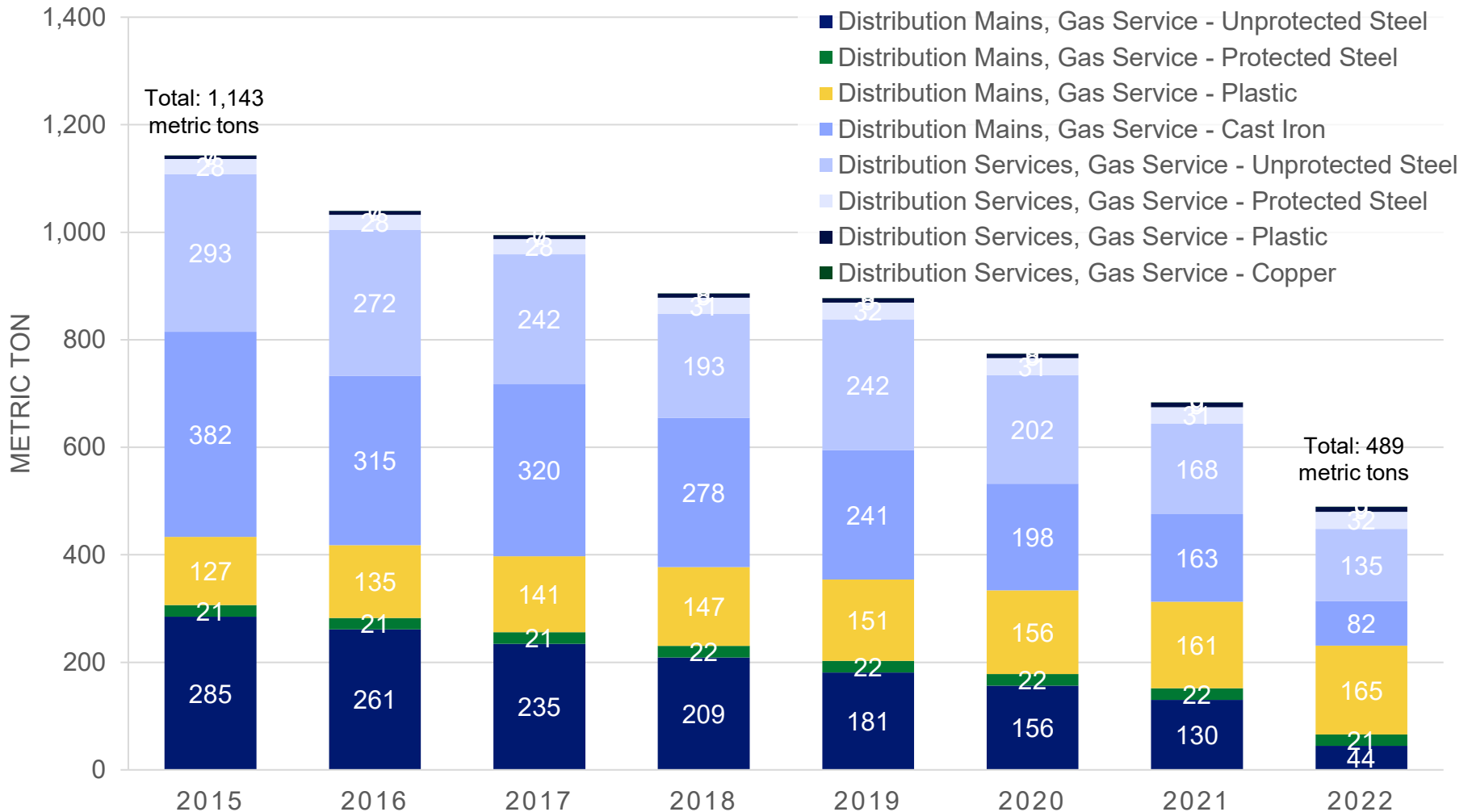
## Scope 3

Indirect emissions  
from non-company  
owned upstream  
and downstream  
services

- Customer  
Usage  
Electric and  
Gas Usage
- Aircraft

# CHGE's Leak Prone Pipe Replacement Program Emissions Reduction

## TOTAL CH<sub>4</sub> EMISSIONS

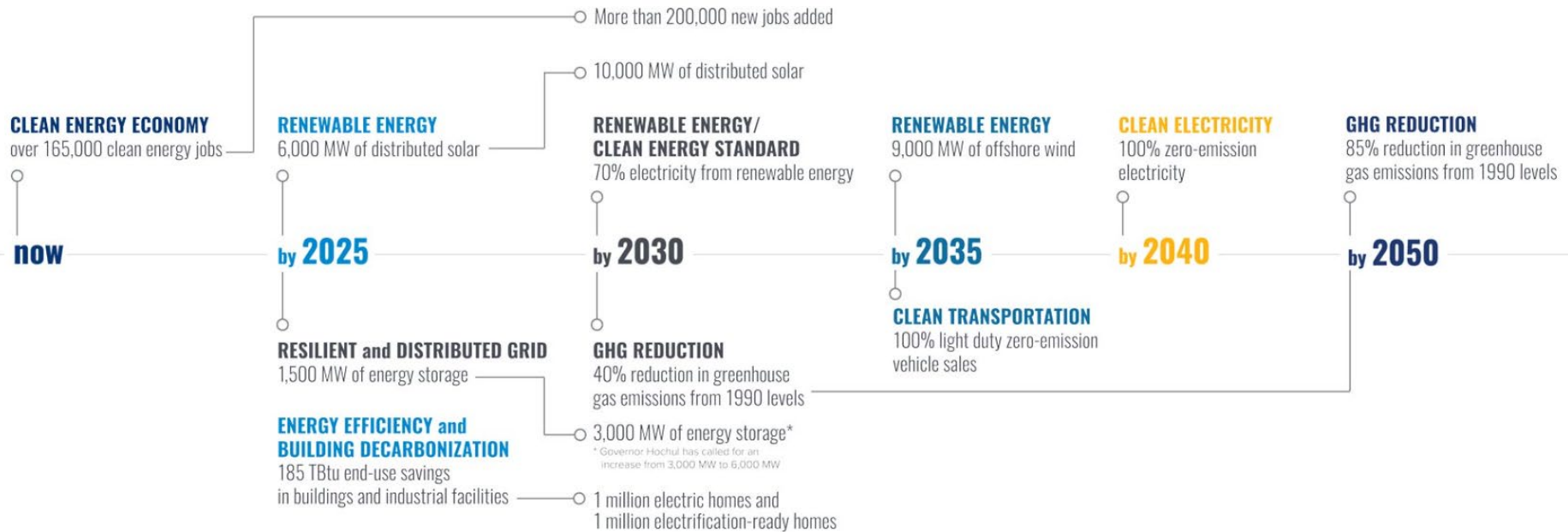


# Additional Initiatives to Reduce Emissions

- **Examples include:**
  - Purchase Responsibly Sourced Gas (RSG)
  - Fleet electrification
  - Non-Pipes Alternatives (NPA)
- **Investment and supporting R&D initiatives on alternative technologies:**
  - Methane recapture technology
  - Proposed Thermal Energy Network pilot project-Project Youth Opportunity Union (YOU)
  - Completion of a Renewable Natural Gas Feasibility Study
  - Completion of RSG gas procurement pilot

# Climate Leadership and Community Protection Act (CLCPA)

## New York's Nation-Leading Climate Targets





# Supporting CLCPA

- Reduction of GHG emissions from updates made to CHGE's natural gas operations complement GHG savings from the electric business and transition to renewable generation
- Projected GHG emissions reduction from gas programs are 175,000 metric tonnes of CO<sub>2</sub>e by 2030, and 325,000 metric tonnes when conversions of oil and propane heat to electric heat pumps are included
- Nearly 70% of CHGE's natural gas side GHG reductions are estimated to benefit Disadvantaged Communities

# Demand-Side Management

Cory Scofield  
Director, Demand Side Management



# Gas Energy Efficiency Programs

## Overview

- Central Hudson's gas energy efficiency (“EE”) and heat pump programs are part of the New Efficiency: New York (“NE:NY”) portfolio
- Program budgets and targets are set through 2025
- The Public Service Commission and Staff are in the process of an Interim Review evaluating the statewide NE:NY portfolio
- The Order Directing Proposals was released in July 2023 requiring utilities to propose budget bounded portfolio proposals and targets through 2026 – 2030
- An Order concluding the Interim Review may be issued in late 2023 or early 2024



## Residential

- Residential HVAC
- Efficient Products
- Behavioral
- Weatherization (Sealed)

## Commercial & Industrial

- Prescriptive
- Custom

## Low- to Moderate Income

- Empower LMI Program
- Affordable Multifamily Energy Efficiency Program
- Community Outreach

Save Energy & Money: <https://www.cenhud.com/en/my-energy/save-energy-money/>

# Clean Heat

## Overview

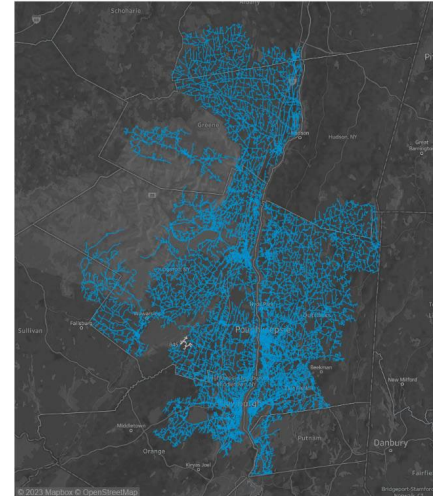
- NYS Clean Heat Statewide program
- Launched in 2020 and authorized through 2025
- Certified NYS Clean Heat contractors install
  - Air-Source Heat Pump
  - Ground-Source Heat Pump
  - Heat Pump Water Heaters
- Residential and commercial customers
- Rebates based on system capacities

## Progress

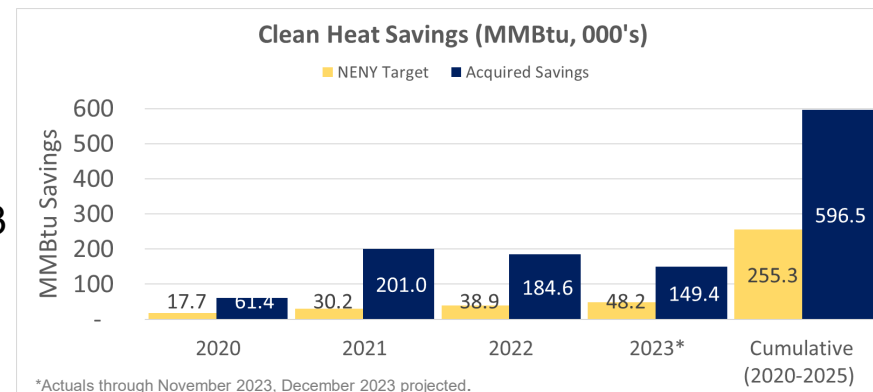
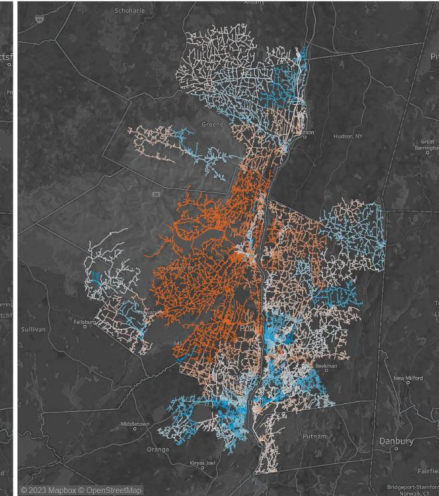
- One of only 2 utilities to have already achieved NENY 2020-2025 cumulative savings target
- 596k MMBtu vs. 255k MMBtu NENY target
- Savings achieved at half the derived unit cost
- Additional Funding Petition approved June 2023
- 9,000+ completed projects
- 6,000+ buildings fully electrified
- Full displacement of legacy fossil fuel system
  - Projects approximately; 50% fuel oil, 17% natural gas, 11% propane, 22% Other (electric, wood, coal)



Heat Pumps - 2018



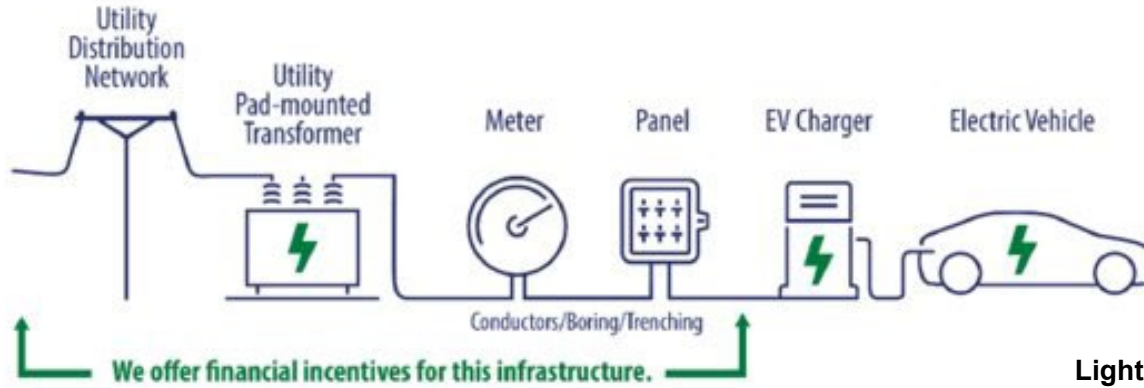
Heat Pumps - 2023



Clean Heat Program: <https://www.cenhud.com/en/my-energy/save-energy-money/residential-incentives/heatpumpincentives/>

# Electric Vehicle Charging Initiatives

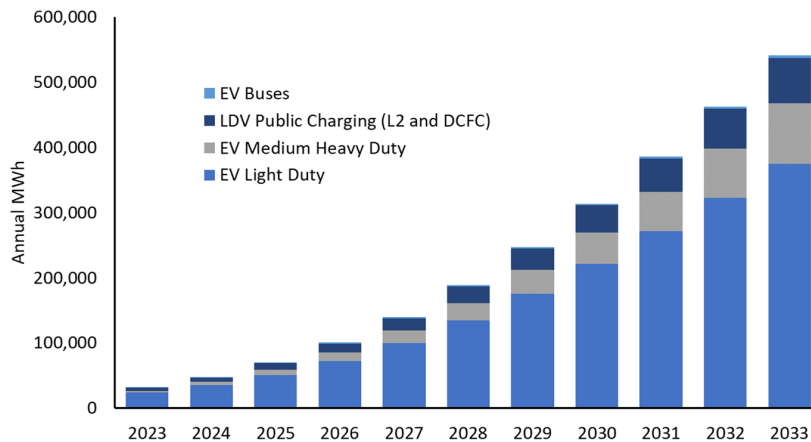
**Make Ready Program:** One-time customer incentives covering the utility-side and customer-side make-ready infrastructure costs associated with Level 2 (L2) and direct current fast charging (DCFC) installations



Goals:

L2	2,037
DCFC	416

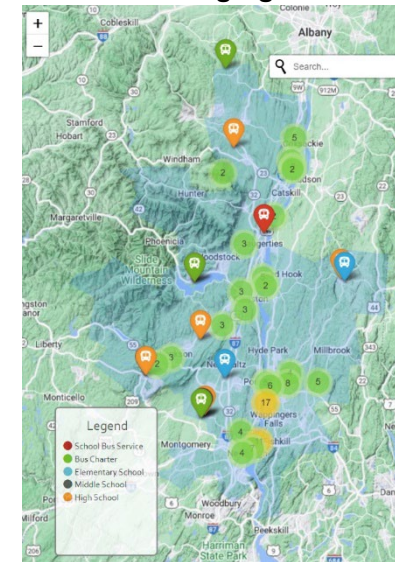
## EV Forecasted Growth & Adoption



Light Duty EV Adoption



DCFC & Public Charging



Make Ready: <https://www.cenhud.com/en/my-energy/electric-vehicles/EV-make-ready-program/light-duty-make-ready-program/>



# Non-Pipeline Alternatives

## Overview

- Alternative to traditional main replacement
- The Company proposed to incorporate NPA projects into its system planning process in its 2017 Rate Case
- The Company has a target of at least 15 miles of Leak-Prone Pipe (LPP) replacement per year

## Whole Home Beneficial Electrification Program

- No cost to the customer
- Gas using equipment (heating and appliances) replaced with electric devices.
- Includes “make-ready” costs (i.e. panel and wiring upgrades)
- 100% participation of gas using customers required in each location
- Ideal for low saturation areas with high replacement cost



Heat  
Pump  
Space  
Heating

Heat  
Pump  
Hot  
Water  
Heaters



Heat  
Pump  
Clothes  
Dryer

Induction  
Stoves &  
Convection  
Ovens



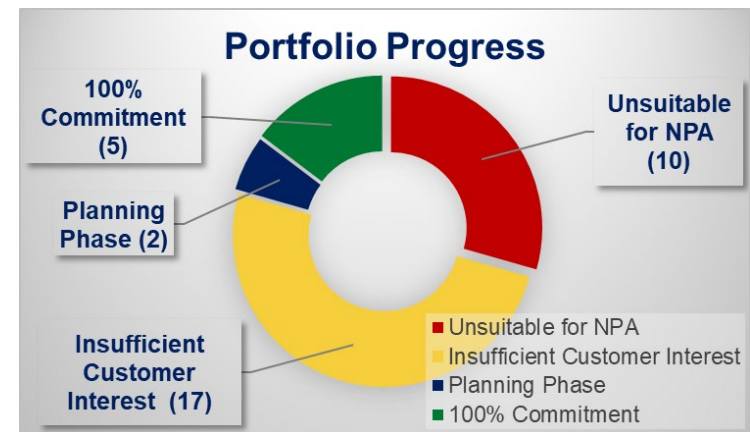
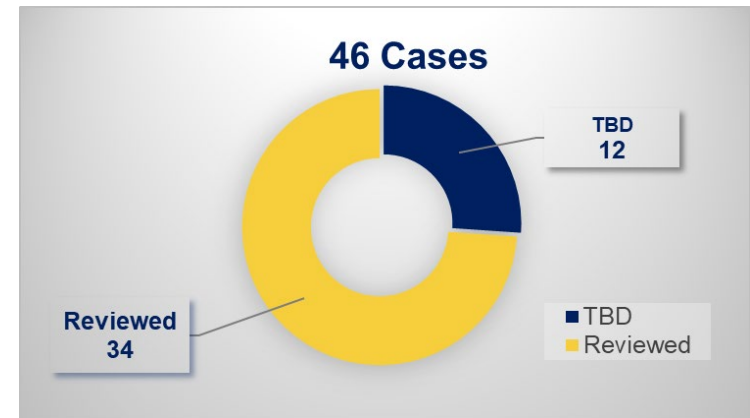
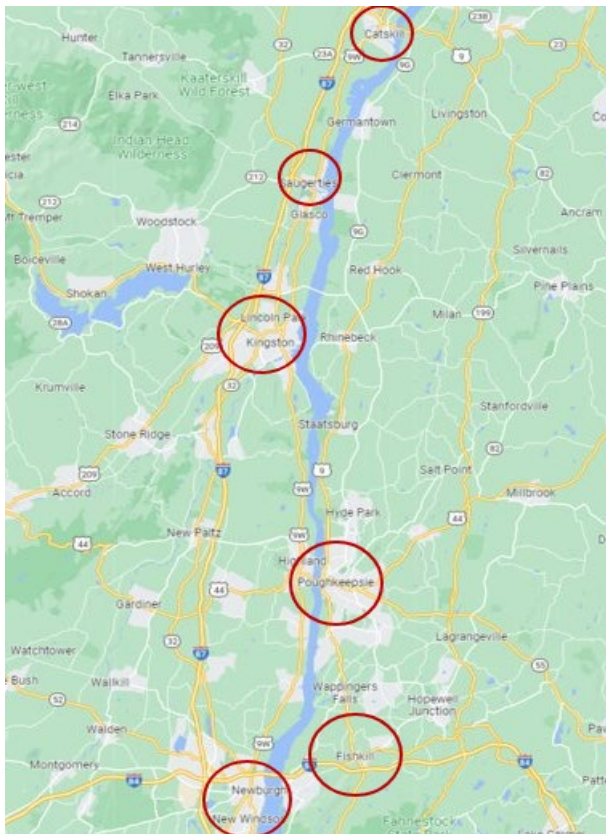
2023 Central Hudson Non-Pipes Alternative Annual Report:  
<https://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=316971&MatterSeq=54153>

Natural Gas-to-Electric Incentive Offer: Whole House Beneficial Electrification Program: [Invitation Only \(cenhud.com\)](https://cenhud.com)

# Non-Pipeline Alternatives

## Progress

- 46 potential cases identified in 11 municipalities
- 34 cases fully reviewed with Benefit Cost Analysis
- Marketing and outreach conducted on 24 cases
- 5 cases, 10 homes converted to full electrification
- 80% of converted locations fall within DACs
- 2,140 feet of LPP eliminated





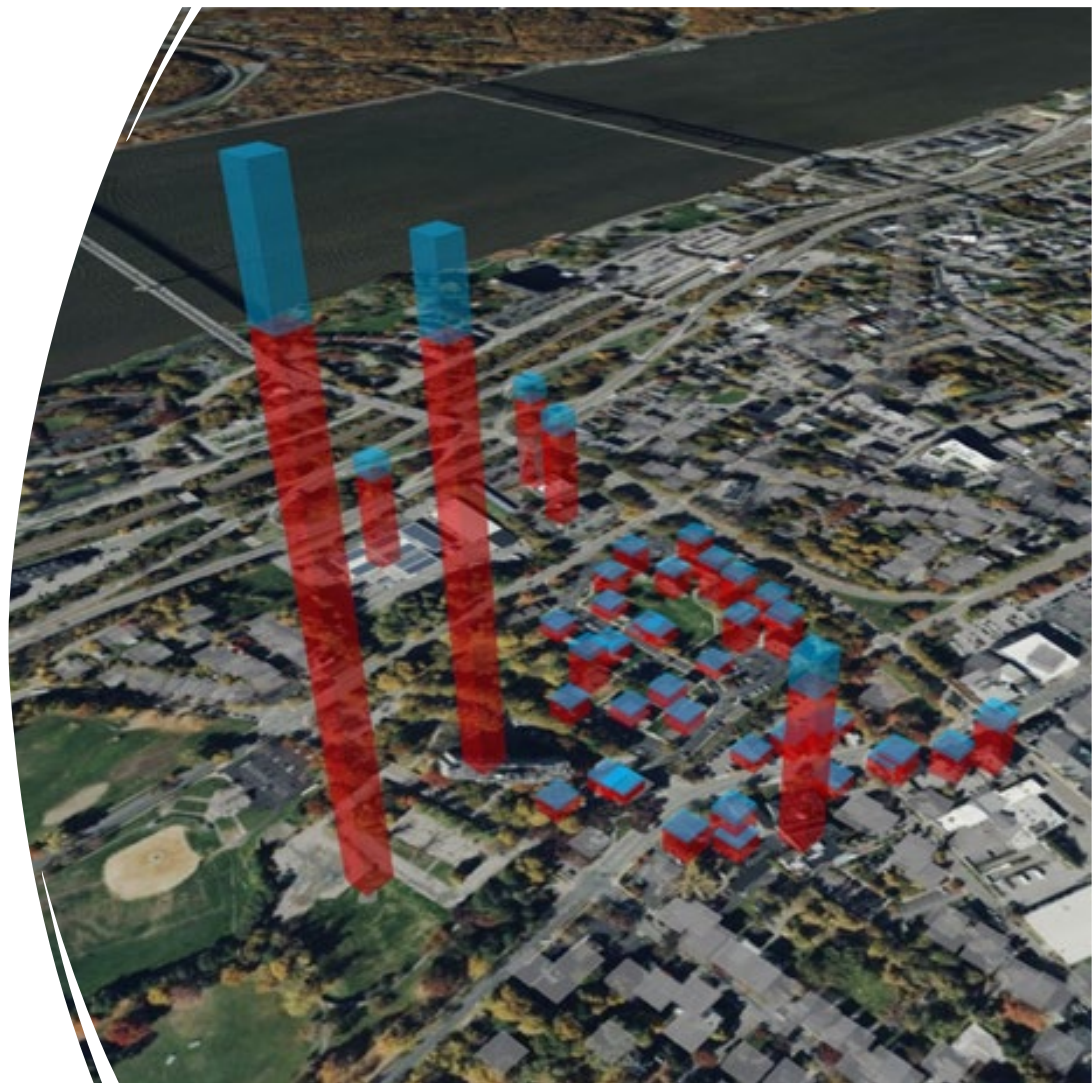
# Utility Thermal Energy Networks

James Keating  
Director, Gas Transformation and Planning



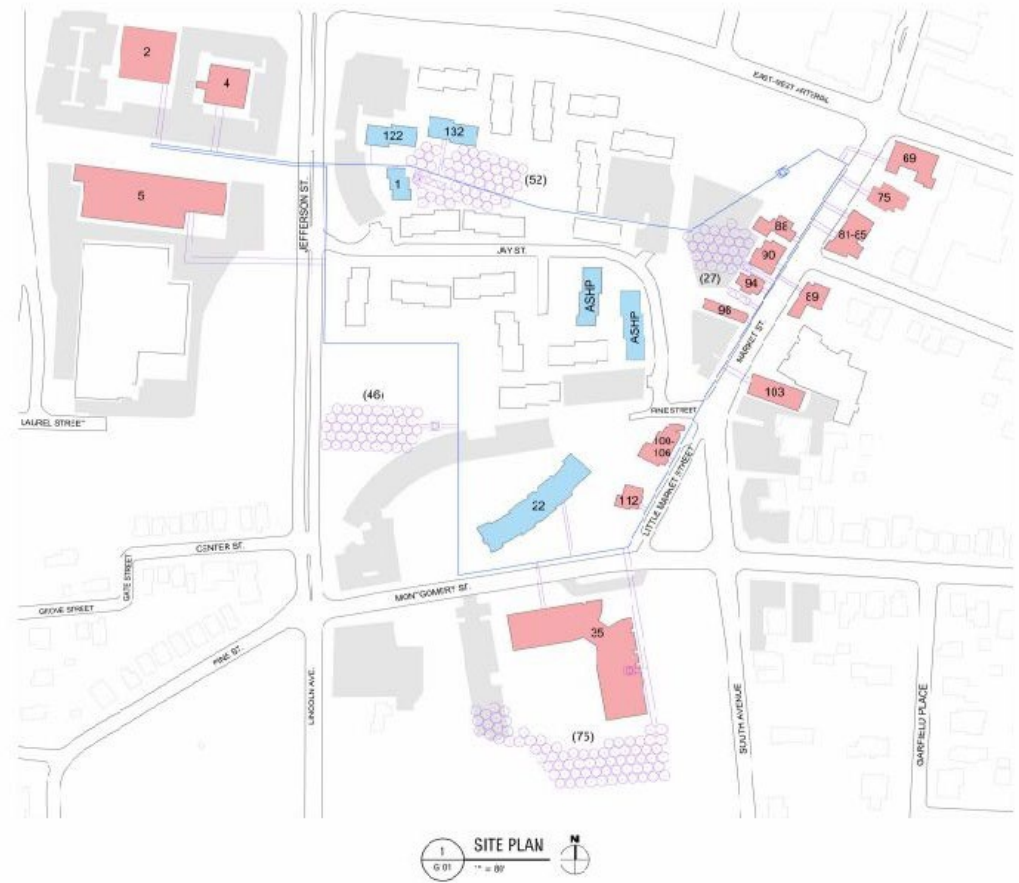
# Utility Thermal Energy Network and Jobs Act

- Decarbonize building emissions with utility scale thermal loops.
- Provides pathway for utility investment / ownership.
- Utilization of skilled craft persons.
- CH designing Pilot Project anchored with New Youth Community Building (The You) and Low-Income Housing in Poughkeepsie.
- Serving DAC and collaborating with a Community Coalition.
- Final Stage 1 Pilot submitted on December 15<sup>th</sup>.

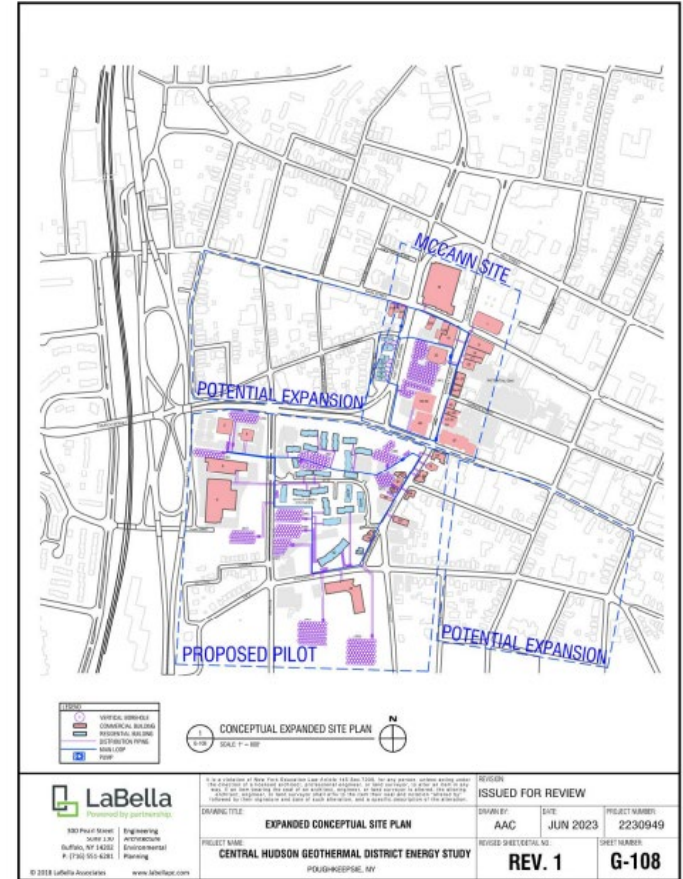
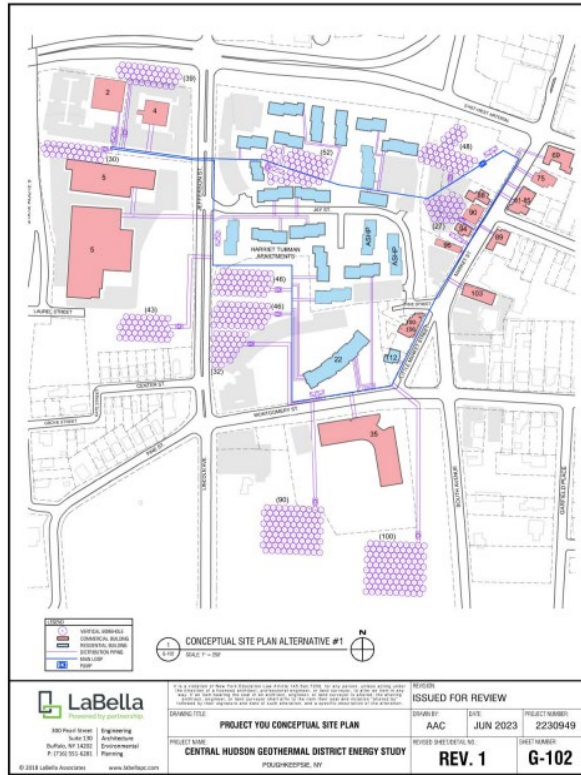


# Preliminary Design

- Single 12" Pipe Ambient Loop
- Potential to Serve 17 Non-Residential and 38 – Residential buildings.
- Serve heating and cooling needs
- Bore fields around the distribution network.



Design that  
Evolves  
and Grows  
into the  
Community





# Next Steps

- Initial Long-Term Plan will be filed on January 16, 2024.
- Technical Conference will be held in February 2024.
- For more information  
[Long-Term Gas System Plan  
\(cenhud.com\)](https://cenhud.com)

# Questions

