NPA Process Overview

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Agenda

- NPA Overview
- Deep Dive on Key Considerations for NPAs
- Illustrative Examples of NPA Projects
- Case Studies
- NPA Candidate Review Process
- Questions

NPA Overview

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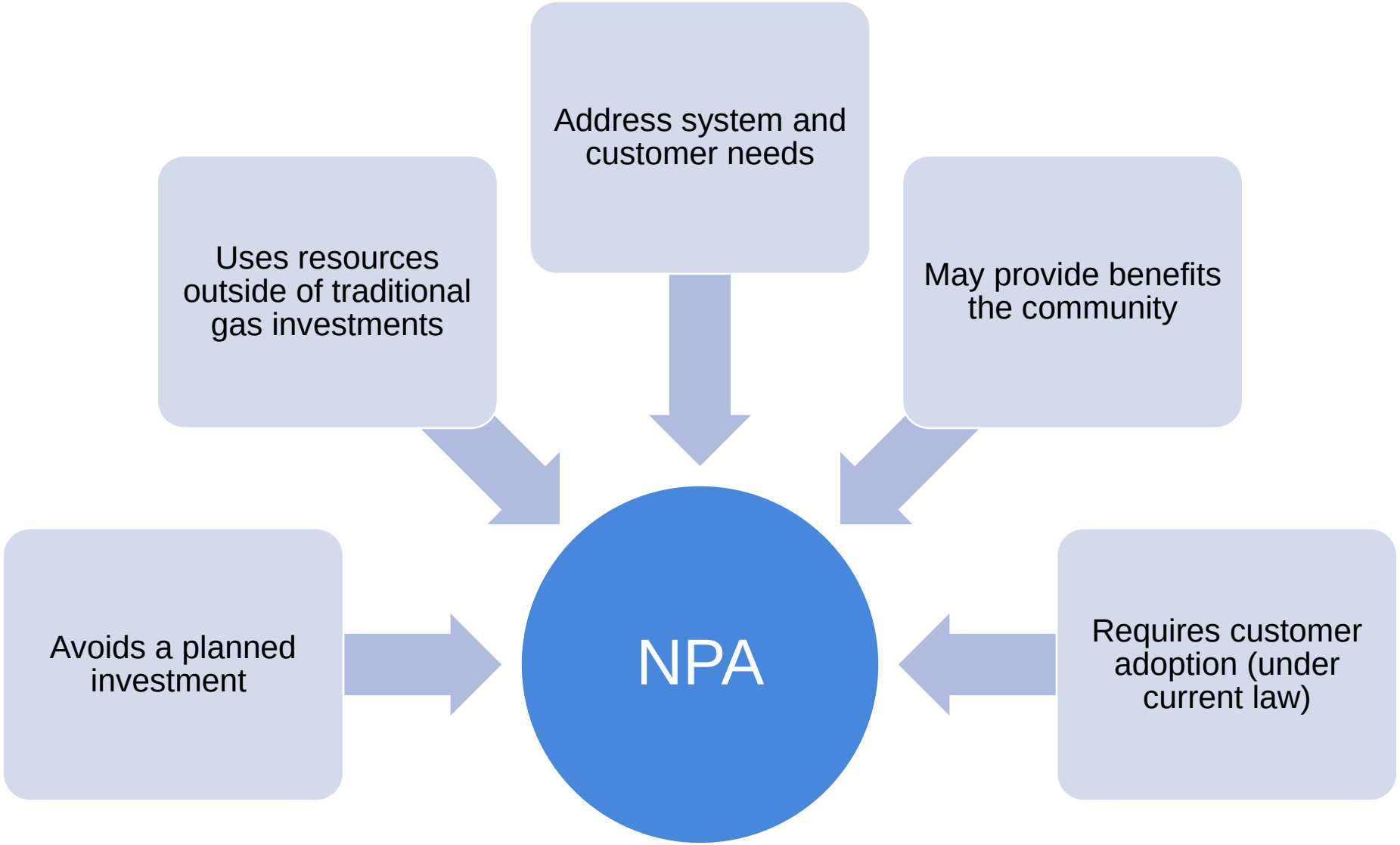
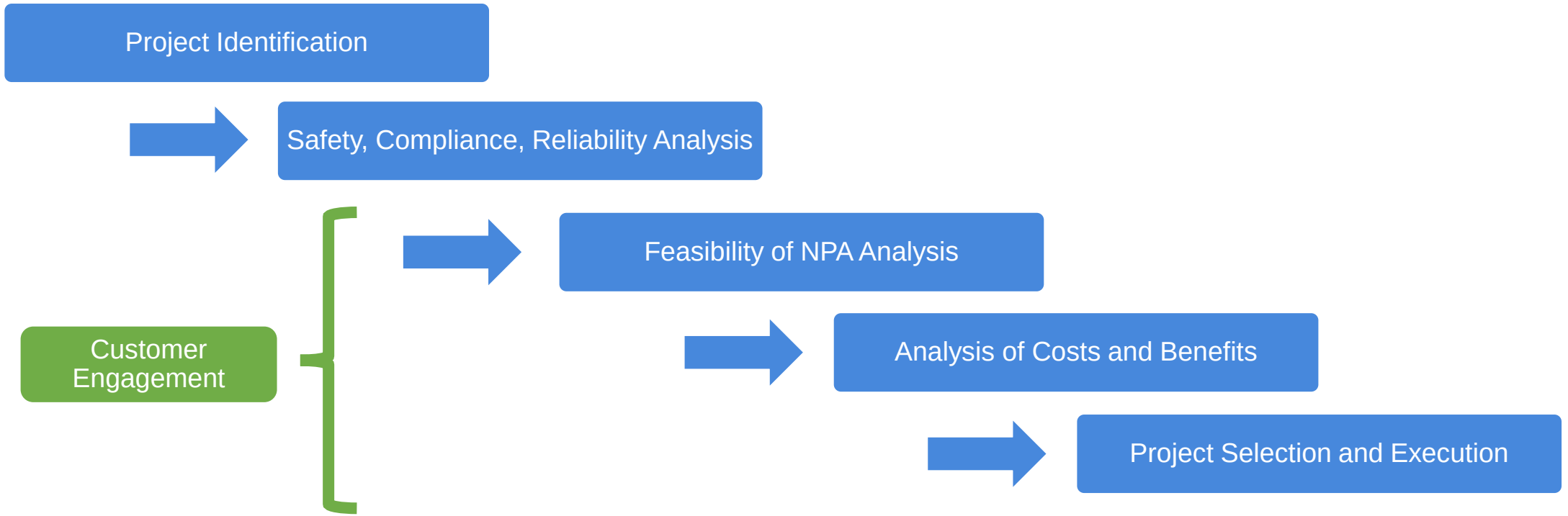
Non-Gas Pipeline Alternatives - Overview

- A non-gas pipeline alternative (NPA) is an investment or measure taken in lieu of a traditional gas system investment
- An NPA analysis or evaluation is the method by which an LDC will determine if there are viable alternatives to traditional gas system investments
- Every LDC's gas system project will be evaluated for an NPA. Considerations will include, but are not limited to:
  - Type of project – GSEP, Reliability, Pressure Regulation, New Customer
  - Reason/need for the project – Asset condition, capacity needs, reliability concerns, customer requested work
  - Timeline for the project – By what date must the work be completed to address reason/need
  - Community and customer impact and benefits
  - Gas and electric system impacts
- The NPA Stakeholder Working Group and Technical Subcommittee will provide input to inform the NPA analysis

Objectives and Considerations of Non-Gas Pipeline Alternatives



Non-Gas Pipeline Alternatives Framework – Key Steps



Promising NPA Candidates

Investment Avoided	✓
Safety Risk is Not Introduced	✓
Compliance Obligations Met	✓
Environmental Justice Benefits and Costs	✓
Timing Allows for Planning/Implementation	✓

Deep Dive on Key Considerations for NPAs

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Key Obligations and Programs for Gas Companies

- Distribution Integrity Management Program (DIMP)
  - Requires gas distribution companies to systematically assess the risks in their pipeline system and develop a plan to mitigate those risks
- Federal Pipeline Safety Act
  - Requires utilities to maintain and modernize infrastructure to prevent incidents
- Gas Safety Enhancement Program (GSEP)
  - Requires gas companies to develop plans and timelines to replace aging and leak-prone pipelines
  - Gas companies are obligated to file the pipeline replacement plan with the DPU and report progress annually
- G.L. c. 21N Emission Sub-limits for Natural Gas Distribution and Service
  - Gas companies must reduce emissions, primarily from leaks, from natural gas pipelines

Compliance Obligations

Will the introduction of conducting and implementing an NPA interfere with compliance obligations?

PHMSA Regulations

Emergency Repairs	Over Pressure Protection	Aging Infrastructure	Maximum Allowable Operating Pressure	Corrosion Control
•192.153(e)(4) •192.503(a)(2) •192.507(a) •192.509(a) •192.553(a)(2) •192.605(e) •192.703(c)	•192.199 •192.740	•192.145 •192.147 •192.275	•192.9 •192.112 •192.153(e) •192.619	•192.143 •192.238 •192.453 through 493

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

Massachusetts Regulations

Emergency Repairs	Over Pressure Protection	Aging Infrastructure	Maximum Allowable Operating Pressure	Corrosion Control
•220 CMR 101.06(2)(b)(1) •220 CMR 101.06(17)(e)	•220 CMR 101.06(2)	•220 CMR 101.09(2) •220 CMR 113.0	•220 CMR 101.06(2)(a)(6) •220 CMR 101.06(2)(a)(7) •220 CMR 101.06(14) •220 CMR 101.06(15)	•220 101.06(9)

Safety Considerations

Does deferring/avoiding the investment introduce a potential risk to people or property?

- **The LDCs are responsible and accountable for maintaining a safe and reliable system**
- **History of leaks**
  - A pipe showing a history of leaks is an indication that it is degrading and requires replacement
- **Pipe material**
  - Different pipe materials present different risk levels
- **Asset Condition**
  - Is there an opportunity to address other distribution assets on the system? (e.g., regulator stations)
  - Are there safety layers that shall be implemented? (e.g., over pressure protection)

Reliability Considerations

Will the NPA impact system pressure and/or ensure adequate supply for customers?

Maintaining system pressures and adequate supply flow

- Determined by the LDCs to ensure adequate pressure to customers to maintain reliable supply to their home or business

Prevent pressure “drooping” at gate and regulator stations

- Stations are built to handle a certain amount of load, as demand increases and stations start to approach that load, the pressures will start to “droop”

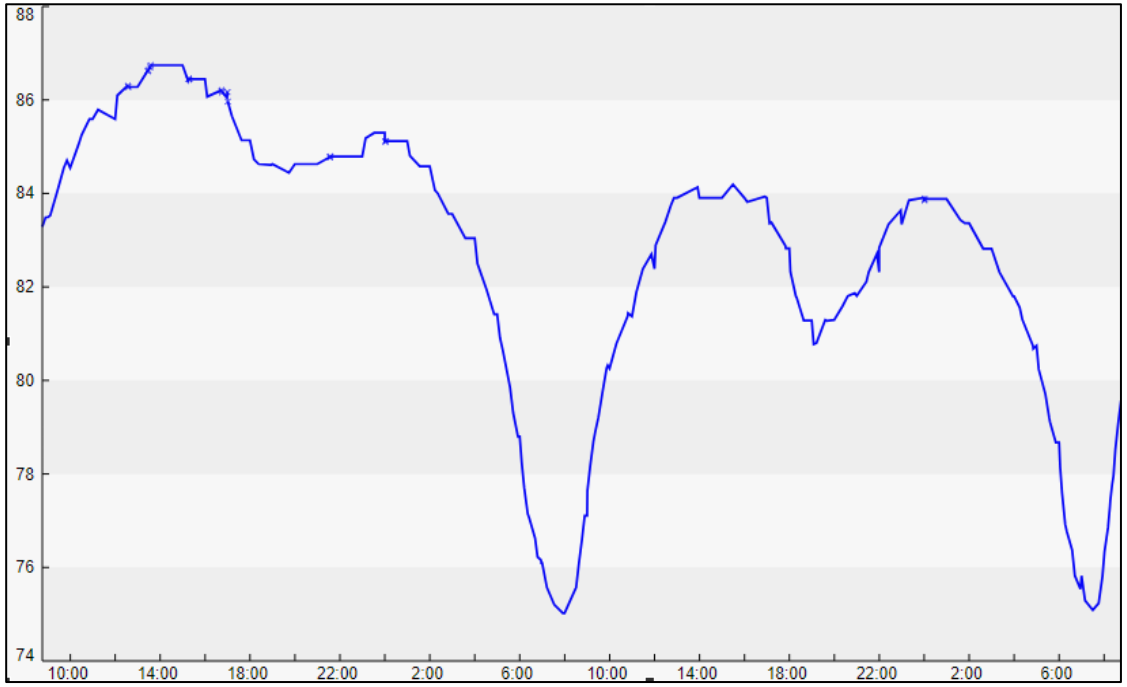
Identifying scenarios with a single source of supply

- Single sources lack redundancy and lead to a larger number of customers affected by a supply issue

Recognizing constraints to supply flow

- More gas can move through larger pipe diameters than smaller ones

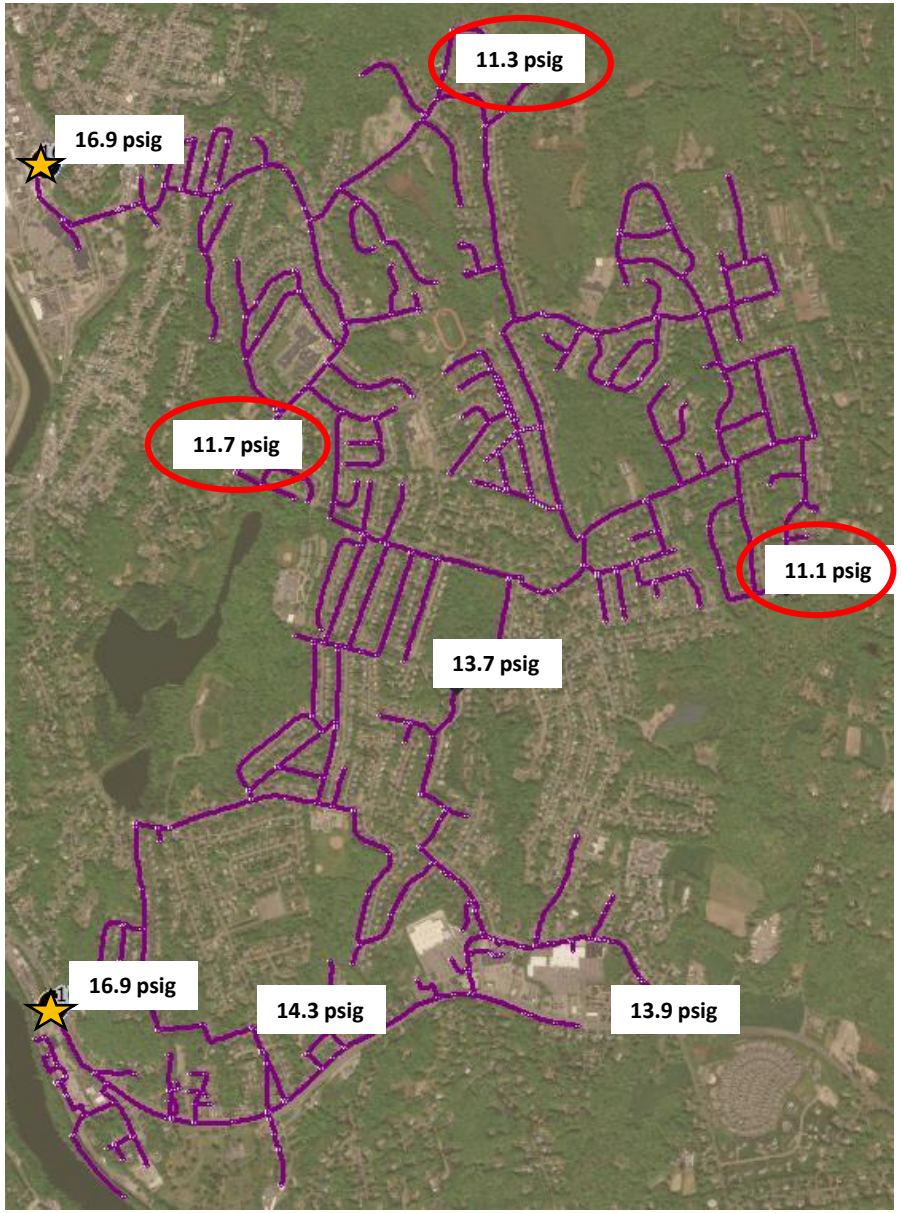
Gas system pressure change over a day



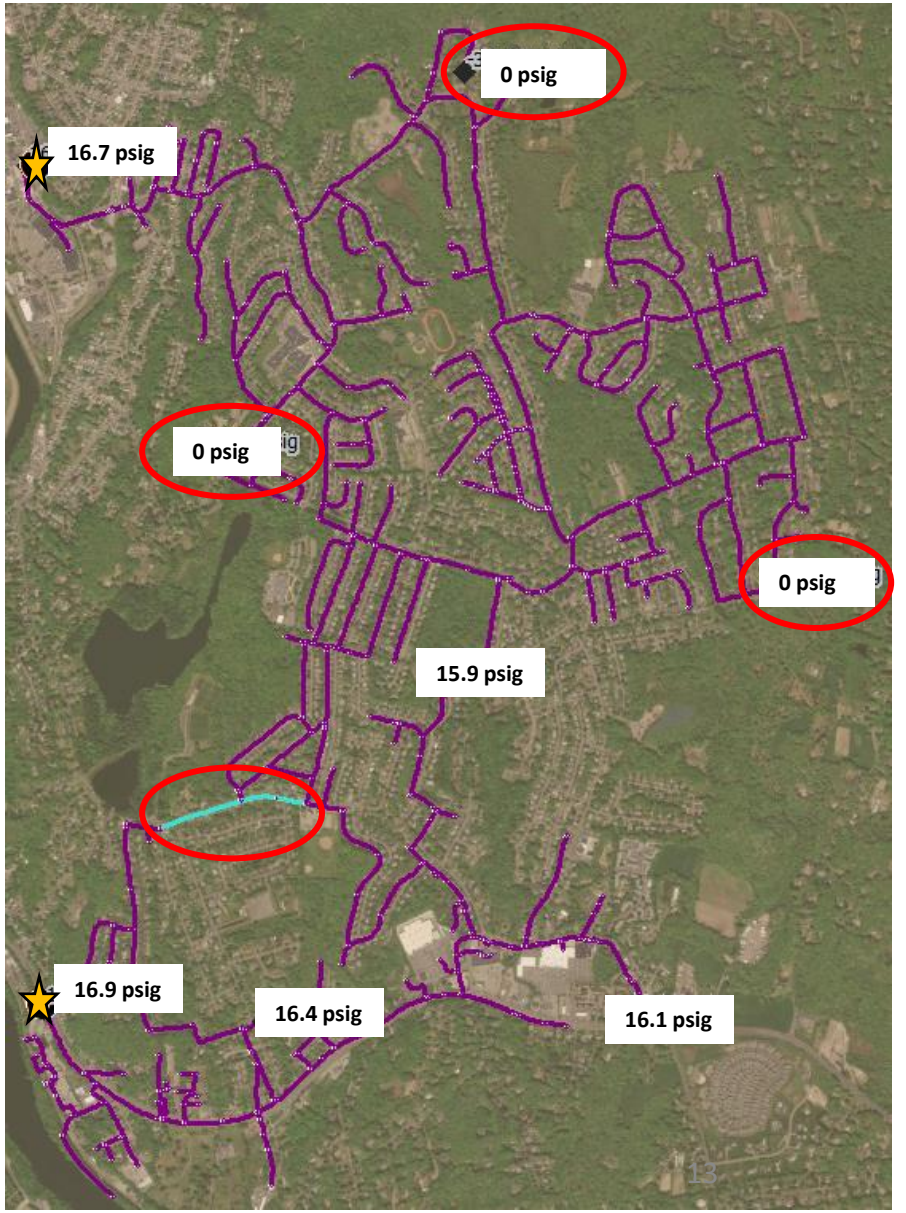
System Reliability

- Maintaining safe and reliable service is our number 1 priority
- Current State of the System:
  - Normal operations
  - Pressures in system are adequate to serve customers
- Modeled Decommissioning:
  - Blue pipe removed from service
  - Pressures are no longer adequate to serve customers
    - Appliances will not work
    - Safety risk introduced
- Pipelines in the middle of a system are not as easy to remove from service as are pipelines at the end of systems

Current State of System

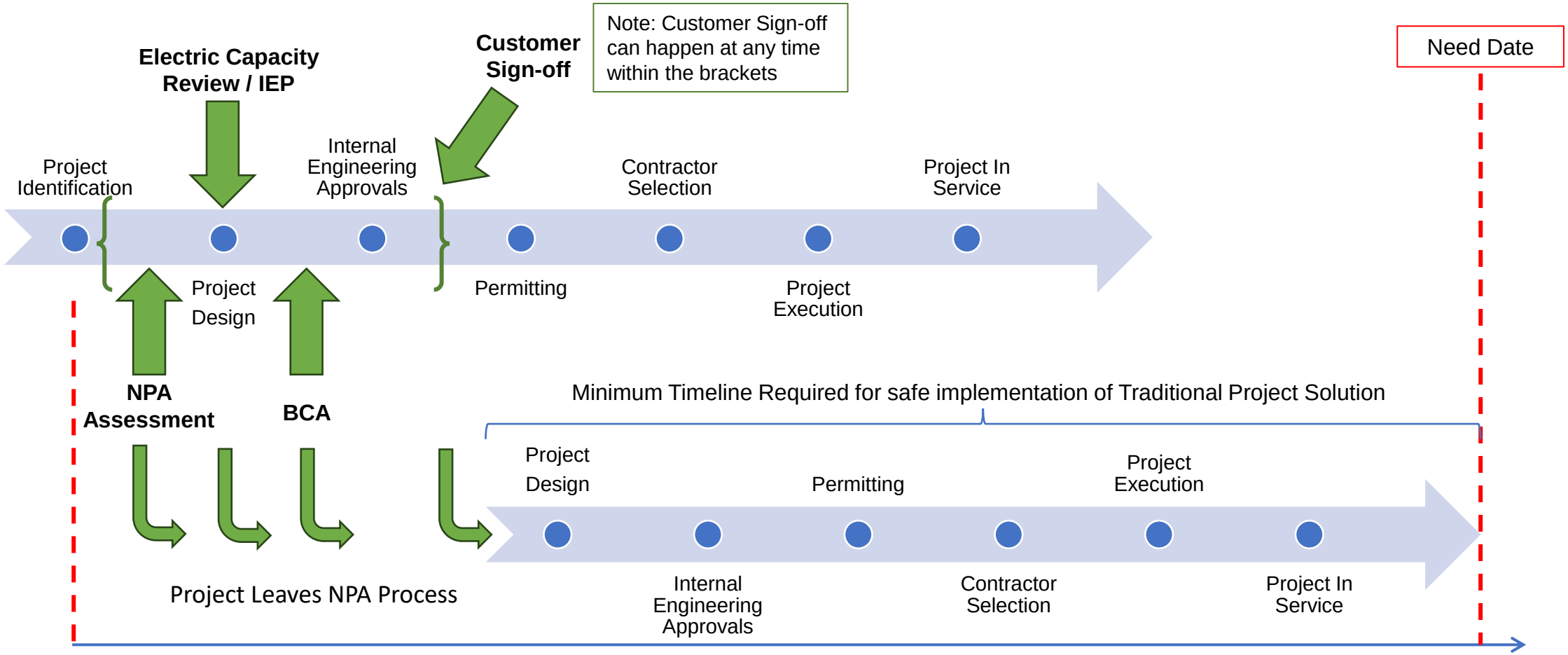


Modeled Decommissioning

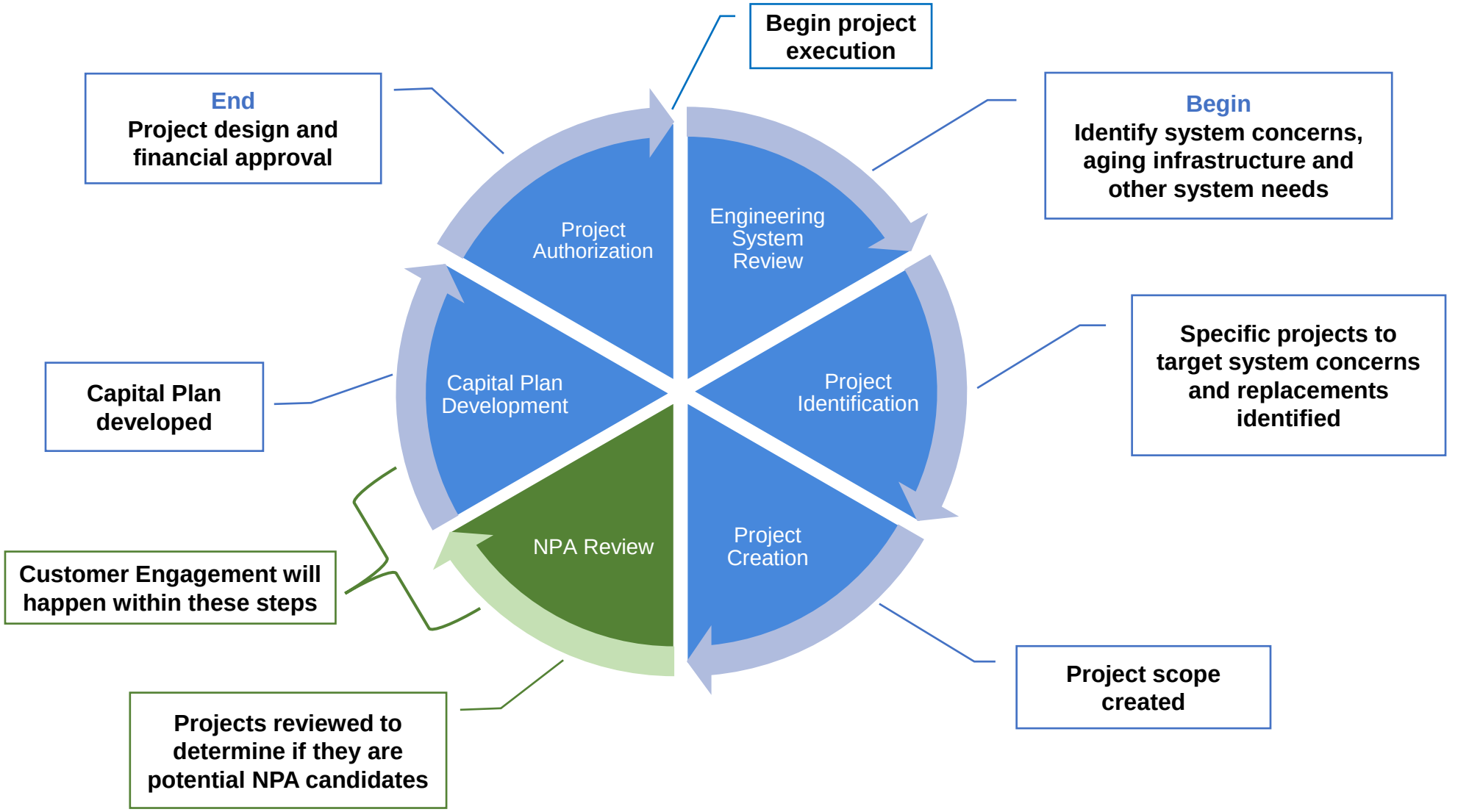


Timing Considerations

Does the timing of the project allow for analysis and implementation?



Timing Considerations: Sample Gas Planning Cycle



Environmental Justice Considerations

What are the benefits and costs for an NPA in an environmental justice community?

What is an environmental justice community?

- **Minority** – Greater than 40% minority households
- **Income** – 25% (or more) of households are below 65% of the MA median household income
- **Language Isolation** – 25% (or more) of households do not include anyone older than 14 who speaks English well
- Any combination of the above

Stabilize rates / costs to customers

- More Energy Efficiency funds available for EJ communities

Ensure that historically overburdened populations see a benefit from the NPA

- Produce environmental benefits
- Introduce new technology

Illustrative Examples of NPA Projects

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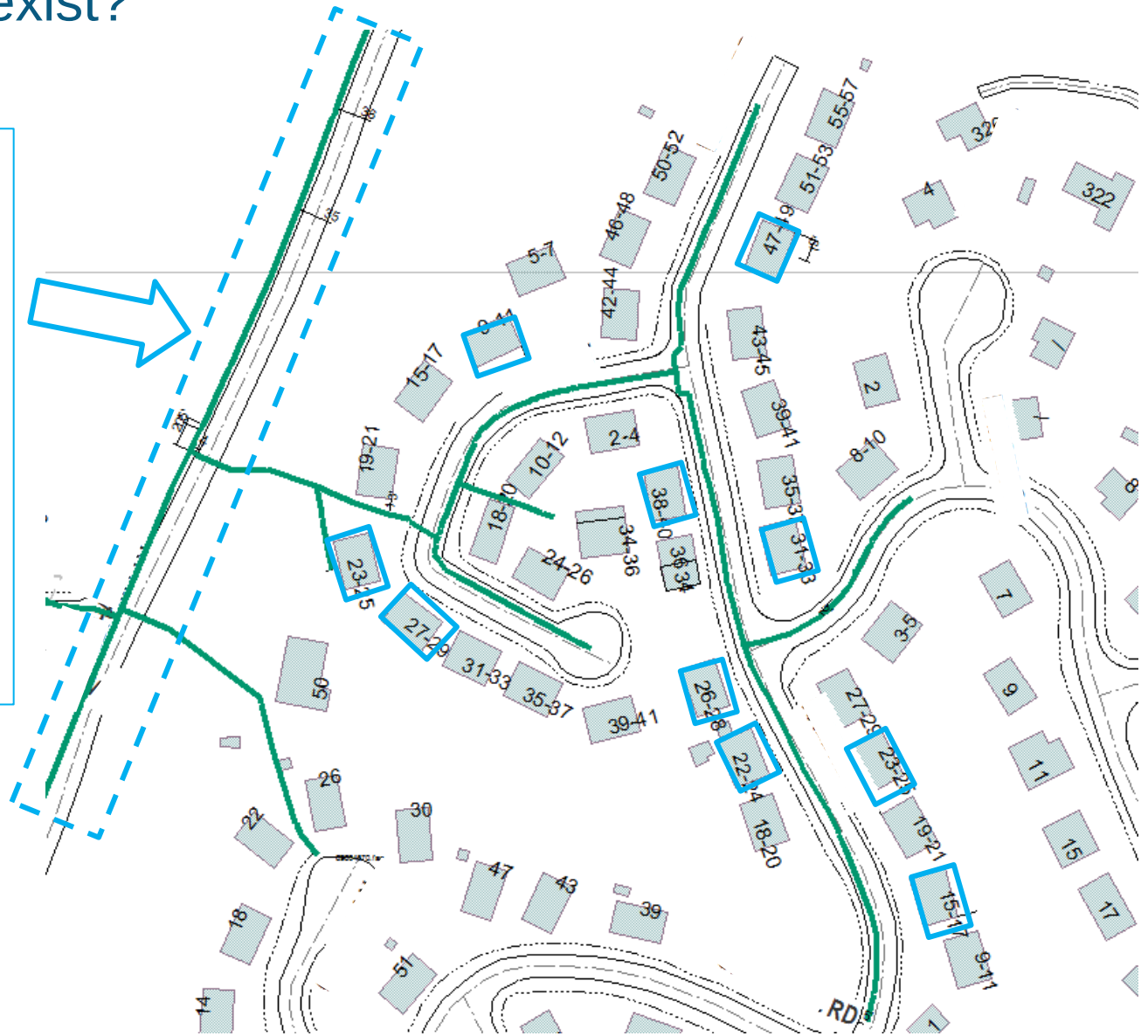
Avoided Gas Investments – Capacity Project

What types of avoided gas investments exist?

To avoid a **CAPACITY PROJECT** on this pipeline, the houses downstream of this pipeline need to reduce gas demand. This can be done by electrifying some houses or demand reductions across the neighborhood. This does not require 100% participation.

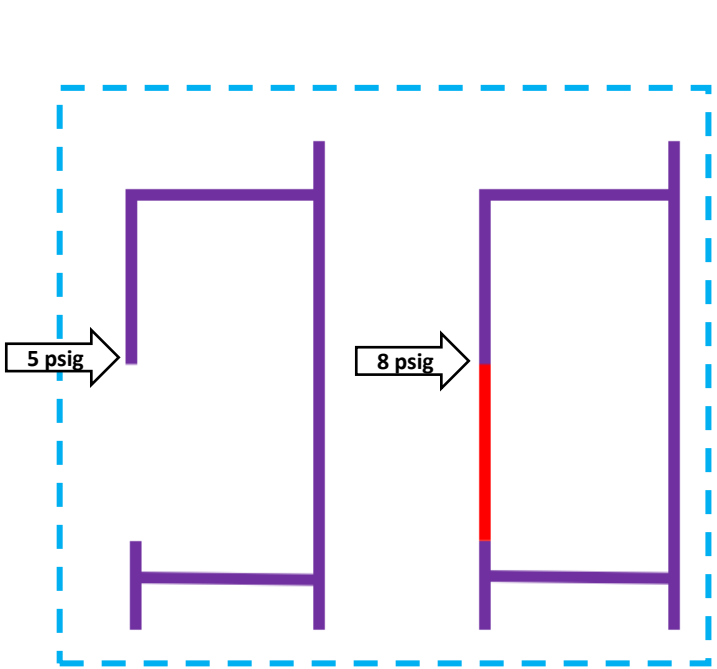
Likely NPA Technologies:

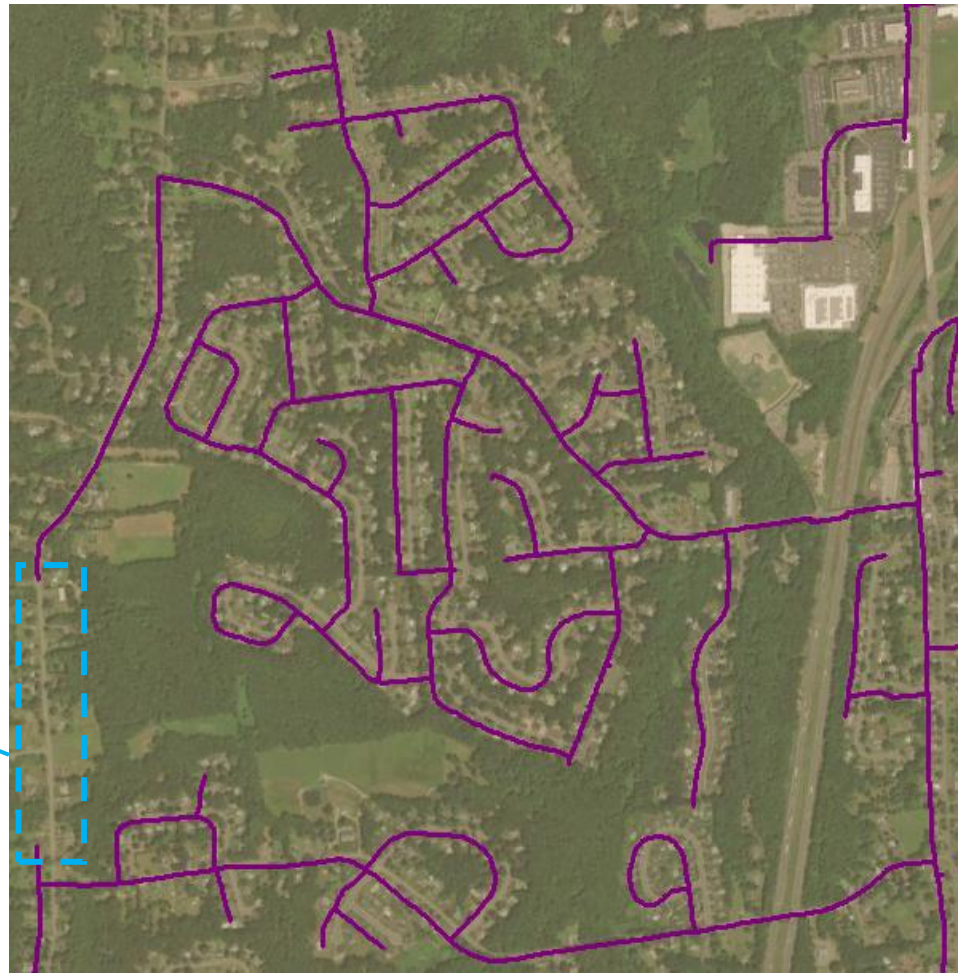
- Electrification
- Energy Efficiency and technology modernization
- Peak Shaving



Avoided Gas Investments – Capacity Project

Capacity Project

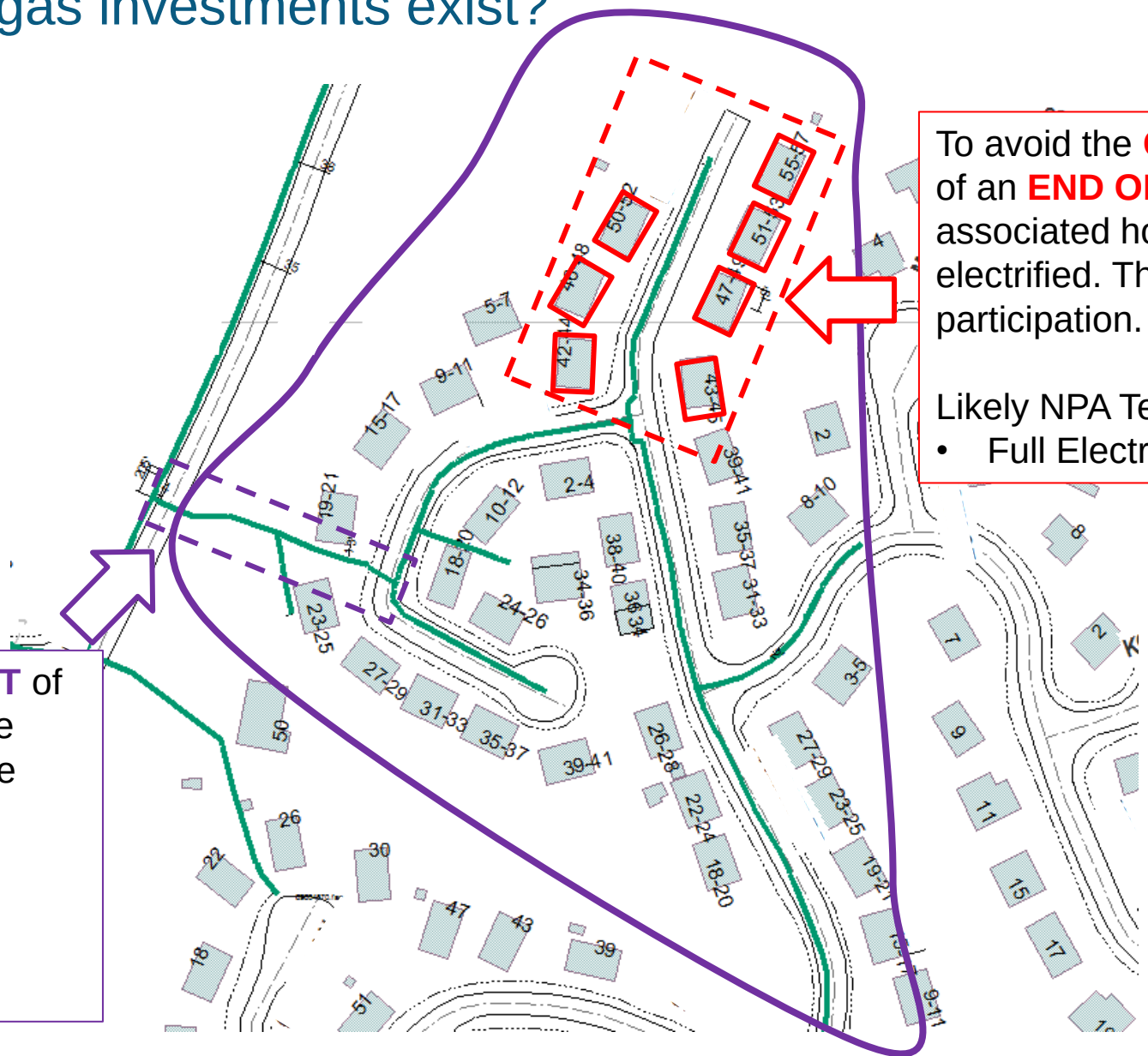




- Current end of system pressure to the north are not adequate
- Traditional Investment: Installing a gas main to loop the pipe and increase pressures in the north of the system
- To avoid the need for this investment the following options are available:
  - Energy Efficiency and technology modernization
  - Electrification
  - Peak Shaving

Avoided Gas Investments – GSEP Replacement

What types of avoided gas investments exist?



To avoid the **GSEP REPLACEMENT** of a **MIDDLE OF SYSTEM** pipe, all the associated houses would need to be electrified. This requires 100% participation.

Likely NPA Technologies:

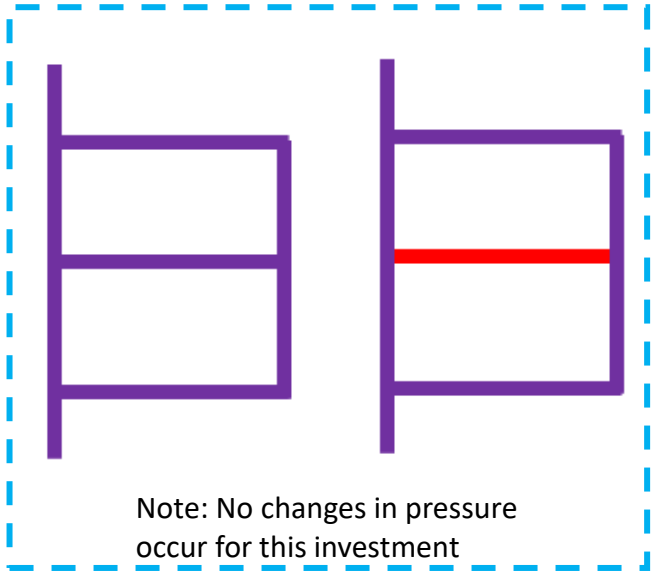
- Full Electrification

To avoid the **GSEP REPLACEMENT** of an **END OF SYSTSEM** pipe, all the associated houses would need to be electrified. This requires 100% participation.

Likely NPA Technologies:

- Full Electrification

Avoided Gas Investments – GSEP Replacement



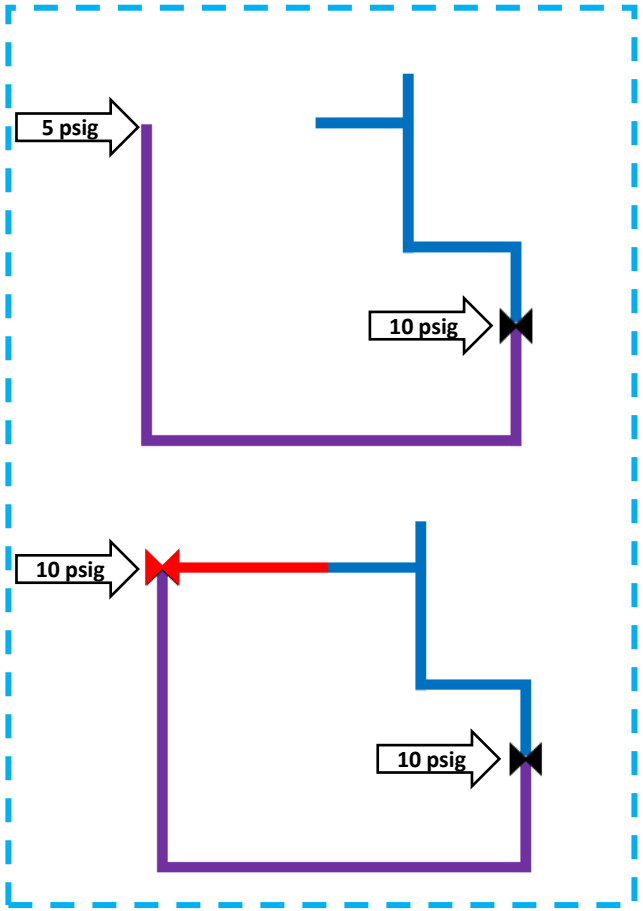
Note: No changes in pressure occur for this investment

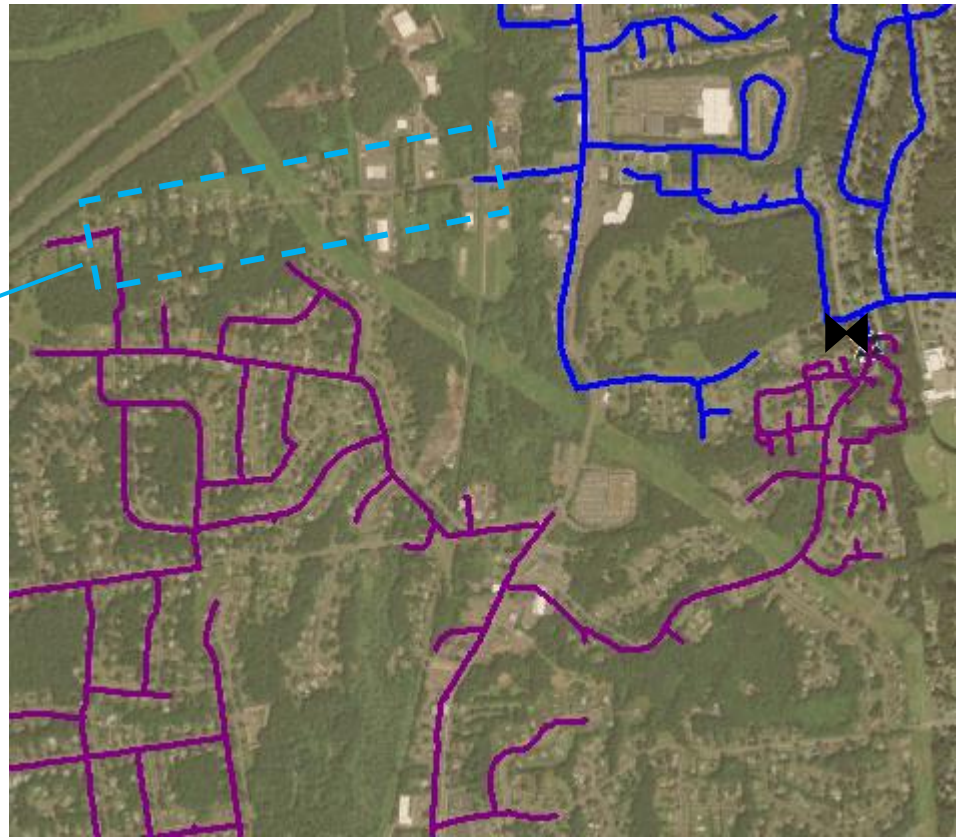
GSEP Pipe Replacement

- Pipe needs to be replaced due to being aging and leak-prone infrastructure
- Traditional Investment: Replace the pipeline
- To avoid the need for this investment the following options are available:
  - Electrification – **100% Customer Adoption**

Avoided Gas Investments – Station Work

Station Work





- Current system pressures at 5 psig are not adequate
- Traditional Investment: Install a new regulator station to increase pressures in the system
- To avoid the need for this investment the following options are available:
  - Energy Efficiency and technology modernization
  - Electrification
  - Peak Shaving

Case Studies

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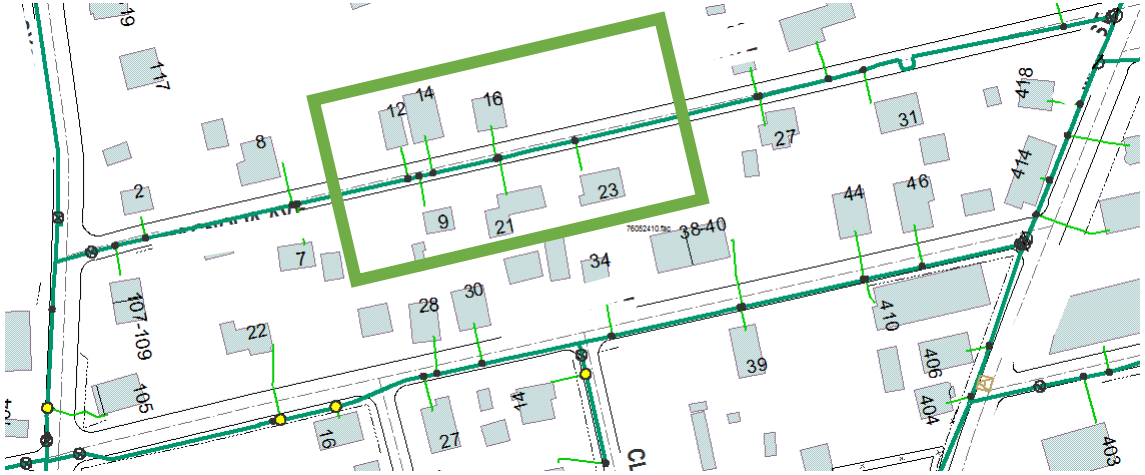
Case Study 1

Project Description: Actively hazardous leaking piece of steel

Is this a potential NPA Candidate?: No

- *Safety Considerations*:
  - Immediate risk to people or property
- *Reliability Considerations*:
  - Risk of not maintaining system pressures
- *Compliance Obligations:*
  - CFR 192.703(c)- Hazardous leaks must be repaired promptly
- *EJ Considerations*:
  - Not an EJ community
- *Timing*
  - A repair must be made immediately

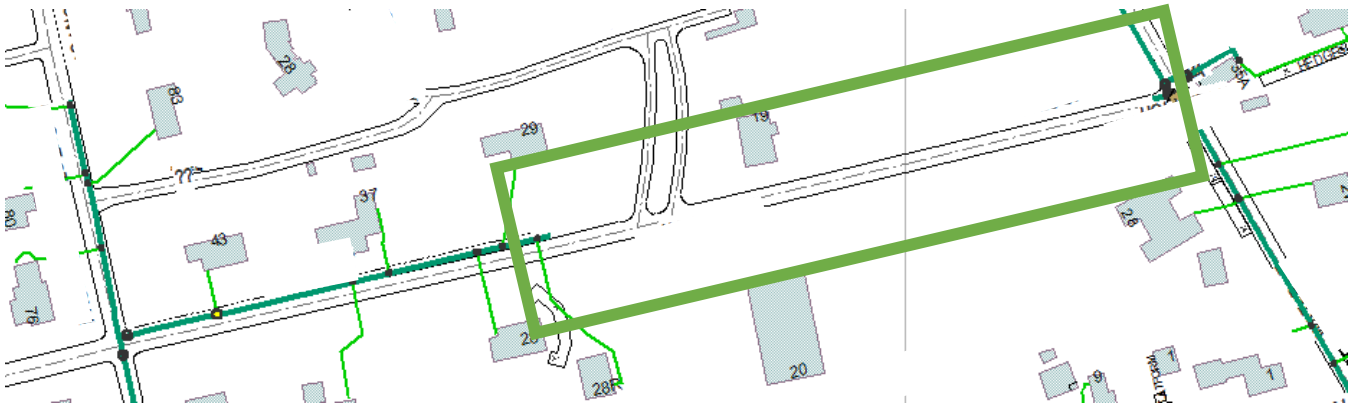


Case Study 2

Project Description: Main installation to improve system pressures downstream

Is this a potential NPA Candidate?: Yes

- *Safety Considerations*:
  - No immediate risk to people or property
- *Reliability Considerations*:
  - Improves system pressures
- *Compliance Obligations:*
  - Maintain safe and adequate pressure to customers
- *EJ Considerations*:
  - Not an EJ community
- *Timing*
  - This work can be delayed; no immediate concern of supply issues prior to the heating season



Case Study 3

Project Description: Leak-prone pipe replacement

Is this a potential NPA Candidate?: Yes

- *Safety Considerations*:
  - No immediate risk to people or property
- *Reliability Considerations*:
  - Does not negatively impact the system reliability
- *Compliance Obligations:*
  - DIMP and GSEP
- *EJ Considerations*:
  - EJ community
- *Timing*
  - This is not an immediate concern

Need **100%** customer adoption

NPA Candidate Review Process

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Project Identification

- Why is the gas project needed?
- Are there potential alternatives to the traditional gas project?

→ **Safety, Compliance, Reliability**

- Is it an emergency?
- Does it address a safety issue?
- Does it maintain system reliability?
- Does it meet a compliance obligation?

Feasibility

- Is there a time constraint?
- What infrastructure improvements are needed?
- Is the project cost effective?

Customer Engagement

- How does it benefit the community?
- How does it benefit the customer?
- Are the customers interested in alternatives?

Project Execution

- Can the project proceed as an NPA?
- What if a hazard or emergency on an asset occurs during any step of the review?

QUESTIONS?

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