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Considerations for an NPA Framework in Massachusetts

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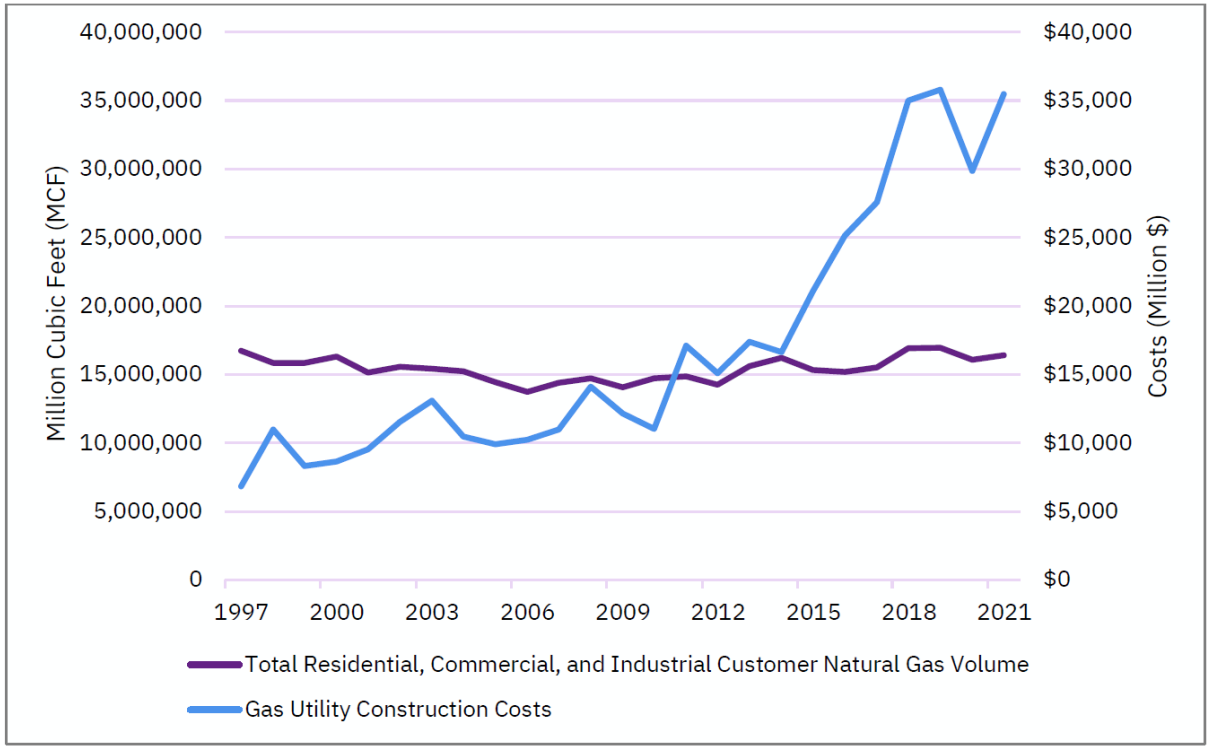
Agenda

1. Why nonpipeline alternatives (NPAs)
2. Benefits of NPAs
3. Project Identification and Feasibility
4. Examples of NPAs
5. Issues to Consider

Why NPAs?

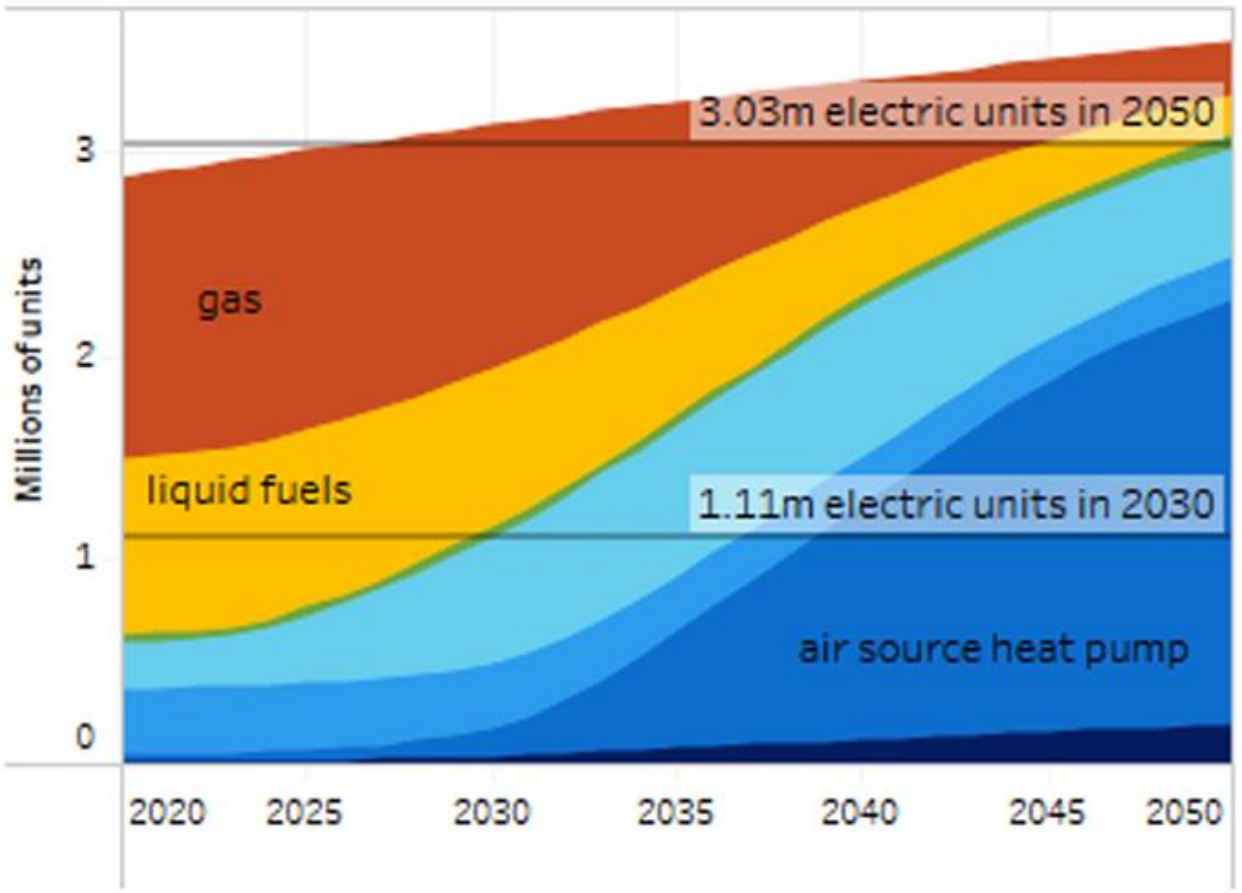
Why NPAs? Investments in gas delivery system are costly and risky

- New gas investments have ~35 – 60 years of useful lives
- Nationally, gas capital investment spending is growing rapidly
- According to National Grid's GSEP, its annual net plant will increase 6% annually from 2022 through 2025
- Assets are at risk of being underutilized or stranded, and customers (largely) carry that risk



Source: Cebulko, B. & Van Hentenryck, T "A Regulator's Blueprint for 21st Century Gas Utility Planning" A Strategen Report prepared for Advanced Energy United. December 2023

Massachusetts climate goals envision a largely electrified building sector



Massachusetts Clean Energy and Climate Plan for 2025 and 2030, June 2022

"The Commonwealth's dominant building decarbonization strategy is electrification. This is currently expected to be the least-cost and lowest-risk pathway compared to approaches with high demand for renewable liquid and gaseous fuels."

- Massachusetts Clean Energy and Climate Plan for 2025 and 2030

"*As the Commonwealth strives to achieve its 2050 climate targets, we envision that the long-term use of the natural gas distribution system generally will be limited to strategic circumstances where electrification is not feasible for all natural gas applications.*"

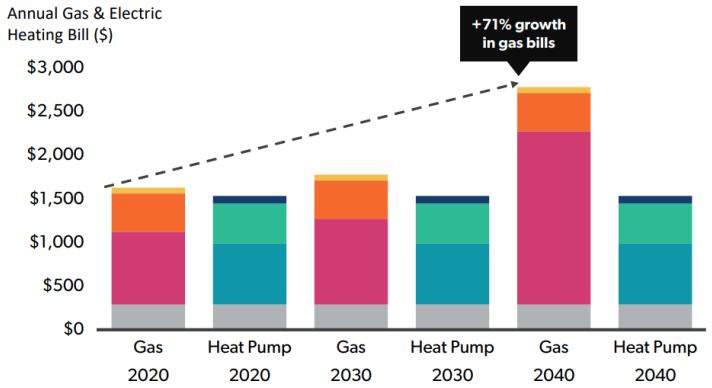
- Massachusetts DPU Order 20-80-B

When gas utility capex spending increases, and demand declines, customer bills spike

ASSESSING RISK

Death Spiral for Gas Utilities: An Illustrative Example

RATES IMPACT FOR GAS AND ELECTRIC CUSTOMERS
– GAS UTILITY NO-ACTION "DEATH SPIRAL" SCENARIO



There is a large potential for non-participant gas bill to grow, which will further increase remaining gas customer's propensity to switch to electric. Impacts are likely to fall disproportionately on low- and moderate-income customers, requiring utility intervention or offsets.

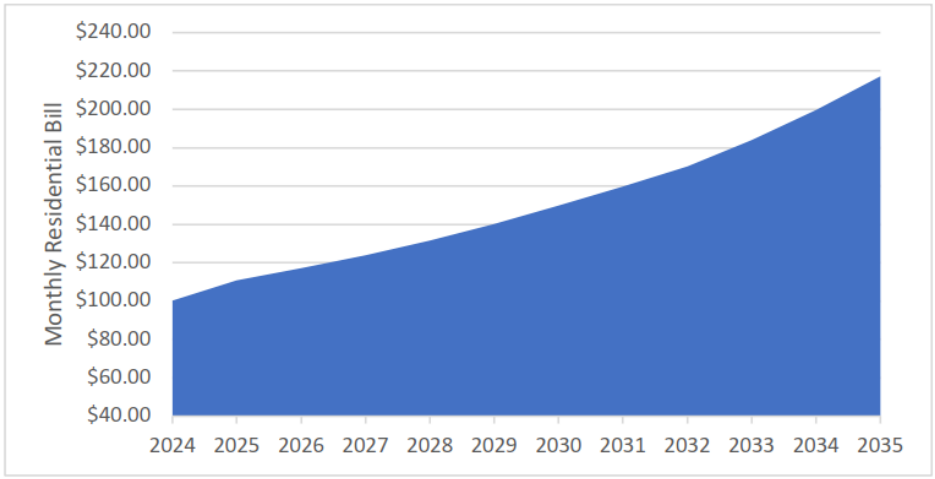
- Gas Surcharges
- Gas Commodity Charges
- Gas Variable Delivery Charges
- Electricity Surcharges
- Electricity Commodity Charges
- Electricity Variable Delivery Charges
- Gas Fixed Delivery Charge

Source: CCIS NYISO forecast and The Brattle Group analysis. | Note: Rate impacts for a gas furnace and air source heat pump customer.

brattle.com | 18

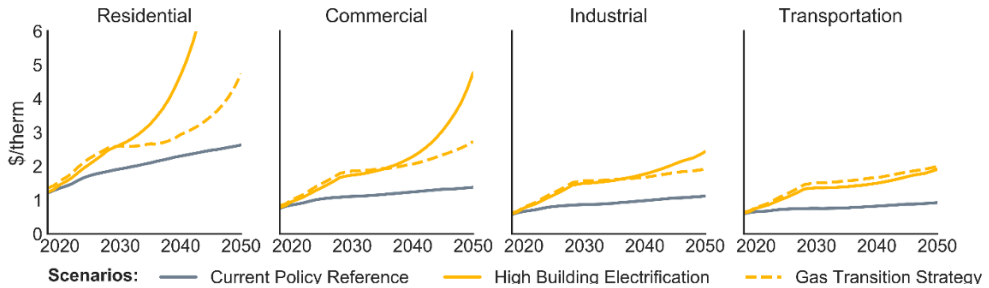
Source: Graves, F et al. "The Future of Gas Utilities Series: Transitioning Gas Utilities to a Decarbonized Future" Brattle, August 2021.

Figure 9: Average Monthly Residential Customer Bill Forecast – Electrification Sensitivity



Source: Cebulko, B. Direct Testimony, The Peoples Gas Light and Coke Company, May 2023. Docket No. 23-0068 & 23-0069

Figure 36: Customer Rates After a Gas Transition Strategy in the HBE Scenario



Source: Aas, D. et al. "The Challenge of Retail Gas in California's Low Carbon Future" Prepared by E3 for California Energy Commission

What are the benefits of NPAs?

A (partial) list of NPA benefits

- Cost reductions
  - Commodity costs
  - Capital expenditures
  - Operational expenditures
- Risk reductions
  - Gas commodity price volatility
  - Underused or stranded assets
  - Future environmental or climate policy
- Emissions reductions
  - GHG emissions compliance
  - Air pollutants reduction
- Customer non-energy benefits
  - Customer comfort
  - Health

Identifying NPA Project Eligibility and Feasibility

An NPA Framework

A preliminary screening of capital projects identifies NPA projects that are more likely feasible and executable. Safety, cost, and timeline thresholds set minimum requirements for project eligibility. For NPAs to be considered, capital projects must meet a minimum cost and there must be enough time to implement a solution.

NPA portfolios can consist of demand-side resources and supply-side resources. Resources vary in cost and emissions impact and are often subject to regulatory eligibility rules. Requests for Proposals (RFPs) are a commonly used method to solicit resource portfolios and costs. Utilities may also develop internal estimates in specific use cases. After identifying eligible NPA resources, utilities construct portfolios to assess whether an NPA project can meet project requirements.

Quantitative and qualitative evaluations of NPA portfolios determine if a project can be implemented. Benefit-cost analysis is a critical component of the evaluation process that compares the societal cost of NPAs against the traditional capital solution. Qualitative factors, including third-party implementation risk, are important considerations in the evaluation process.

Source: Nelson, R. Cebulko, B. et al. "Non-Pipeline Alternatives: A Regulatory Framework and a Case Study of Colorado" A Strategen Report prepared for Lawrence Berkeley National Laboratory

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Identifying NPA Opportunities - Traditional Capital Expenditure Categories

- Categories change by jurisdiction
- Some utilities may divide a category into several subcategories (e.g., new customer requests could separate service and main lines)

Emergency/safety

New customer requests

Mandatory relocations/government request

Capacity expansion

Reliability/pipeline replacement/GSEP

Stations

Gas capex investments other than Emergency/Safety (Grade 1 leaks) should be NPA eligible

- Emergency/safety
- New customer requests
- Mandatory relocations/government request
- Capacity expansion
- Reliability/pipeline replacement/GSEP
- Stations

Cost Thresholds and Timeline Criteria Inhibit NPA Selection

- NPA analysis is reactive and time consuming
  - Identify a capex project
  - Screen for safety/compliance
  - Feasibility assessment
  - Cost-benefit analysis
- PUCs screen for cost and timeline to reduce resource burden
- **Proactive analysis will increase odds of NPA selection**

LDC	Cost		Timeline		Size		
	Large Project	Small Project	Large Project	Small Project	Large Project	Small or Large Project (could go either way)	Small Projects
NFG	> $2 million	< or equal to $2 million	36-60 months	24-36 months	Covers a larger geographic area; associated with significant regulator station upgrades or larger high-pressure mains	Involves several streets or a small neighborhood	Involves a limited number of streets or only a few services
ConEd	> $2 million	< or equal to $2 million	36-60 months	24-36 months			
O&R	> $2 million	< or equal to $2 million	36-60 months	24-36 months			
Central Hudson	> $2 million	< or equal to $2 million	> 24 months	12-24 months			
KEDLI and NMPC*	> $2 million	$500k to $2 million	> 36 months	24-36 months	Covers a larger geographic area; associated with significant regulator station upgrades or larger high-pressure mains	Involves several streets or a small neighborhood	Involves a limited number of streets or only a few services
KEDNY*	> $3 million	$750k - $3 million	> 36 months	24-36 months			
Corning	Project costs equal to or greater than 2% of utility plan less than depreciation reserve and deferred income tax	Project costs less than 2% of utility plan less than depreciation reserve and deferred income tax	36-60 months	24-36 months			
SLG	> $500k	$100k - $500k	36-60 months	24-36 months			
NYSEG and RG&E	> $2 million	< or equal to $2 million	Minimum 12 months to start of construction		No commentary provided		

Source: Nelson, R. Cebulko, B. et al. "Non-Pipeline Alternatives to Natural Gas Utility Infrastructure: An Examination of Existing Regulatory Approaches" A Strategen Report prepared for Lawrence Berkeley National Laboratory

Portfolio development: Both demand- and supply-side resources can be used individually or as part of a portfolio to create an NPA

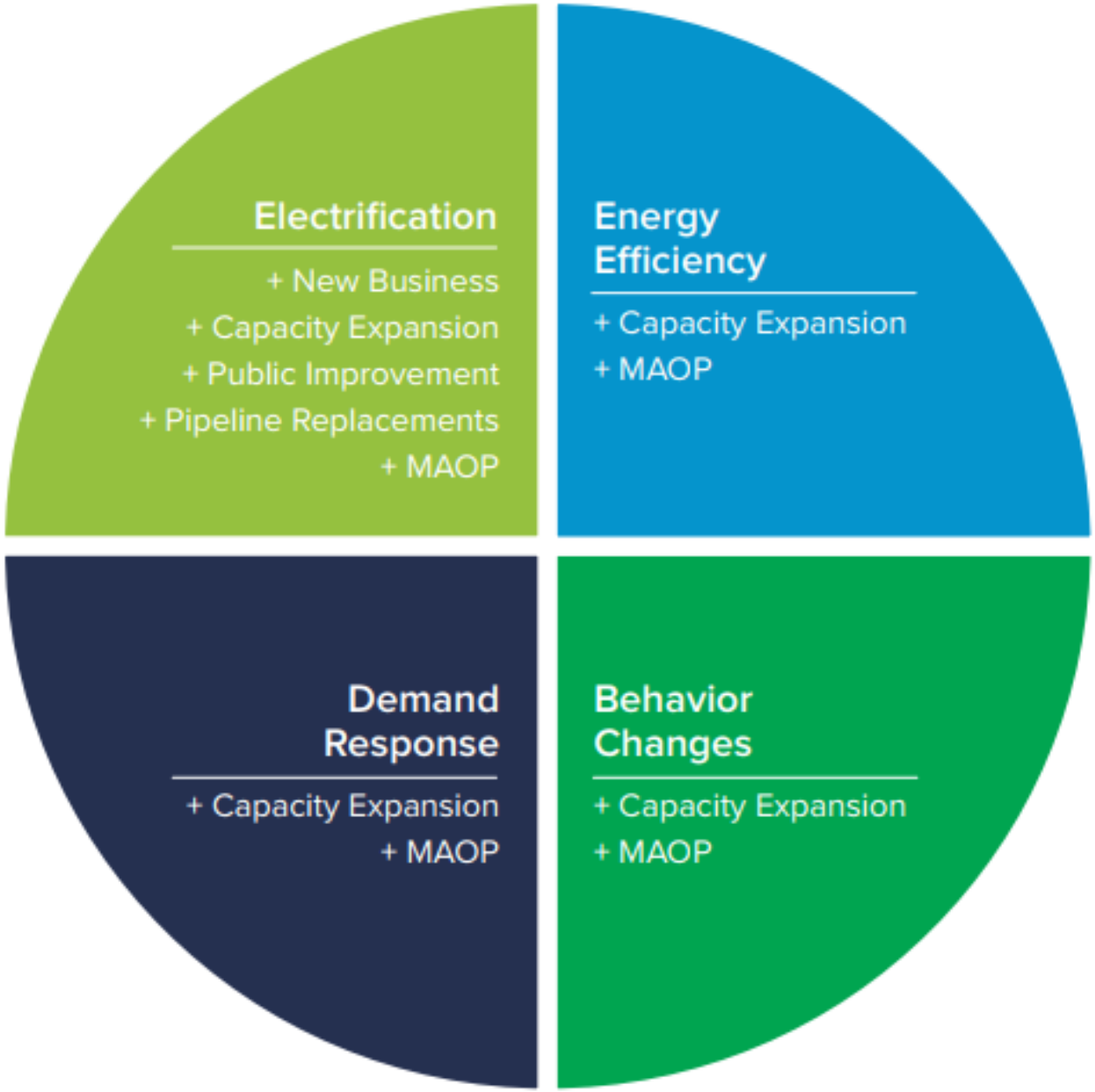
Demand-Side

- Demand response
- Energy efficiency
- Electrification
- Behavioral programs
- Networked geothermal
- District heat

Supply-Side

- On-system liquified natural gas
- Compressed and liquified natural gas trucking
- Propane air peak shaving
- Customer-sited propane
- On-system gas storage

- Certain demand-side resources are best suited as NPAs to specific project categories.
  - New business extensions, pipeline replacements, and mandatory relocations can only be avoided through full electrification.
  - Capacity expansion and MAOP projects can be avoided through any measures that reduce demand sufficiently.



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NPA Examples

Case Study: PG&E CSU Monterey Bay Project

- The CSU Monterey Bay zonal electrification project is PG&E's largest to date, electrifying over 600 campus housing units.
- 8 miles of pipe serving the CSU campus identified through DIMP for replacement through 2025. The cost of the traditional pipeline project would have been $16.5 million.
- Instead, PG&E will conduct an $17 million full electrification project that will install heat pumps, heat pump water heaters, and electric resistance stoves in campus housing.
- Project is ideal for zonal electrification as nearly all housing units are owned by one customer (CSU), so obligation to serve is not a barrier.
    - Electrification project supports CSU campus sustainability goals

Case Study: Xcel Mountain Energy Project

- The Mountain Energy Project is required to mitigate forecasted capacity shortfalls in Breckenridge, Keystone, and Grand Lake, Colorado.
- Gas infrastructure option is estimated to cost between $115 million and $328 million over 3 years.
  - Would require building multiple LNG and CNG assets, plus MAOP remediation in Rollins Pass
- Instead, Xcel is proposing a hybrid NPA approach:
  - $42 million of electrification and efficiency incentives.
  - Two modular LNG sites totaling $13 million for peak shaving in Breckenridge and Keystone.

Case Study: Puget Sound Energy Duvall Targeted Electrification Project

- Puget Sound Energy is proposing a residential targeted electrification pilot in Duvall, Washington, as there is currently insufficient system capacity to meet demand in this geographic area on an extreme cold weather day.
- Through 2028, the electrification project will target up to 1,000 residential single-family customers currently using gas space heating.
- The traditional pipeline capacity expansion project would have cost $11 million and would take place in difficult wetland terrain.
- The electrification alternative will cost $8 million.

Issues for Future Discussions

Questions to explore in future meetings

- Individual NPA analysis requires significant resources (time and money), which inhibit the number of projects that can be examined. How can we take a more proactive approach for NPA analysis?
- How do we assess the impacts (costs and benefits) for projects located in Environmental Justice Communities? Is there a role for qualitative analysis?
- Which energy and nonenergy costs and benefits should be included in a cost/benefit analysis?
- If the state creates a proactive NPA framework, what assumptions does it make about the impacts to the electric system?
- Standard in Order 20-80-B: “Adequately considered and found to be non-viable or cost prohibitive.“ How does Massachusetts define adequately considered and non-viable/cost-prohibitive?

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Thank you.

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