CRA Insights

Energy

CRA Charles River Associates

Prove your pipes: How Non-Pipeline Alternatives are evolving gas utility planning and growth opportunities

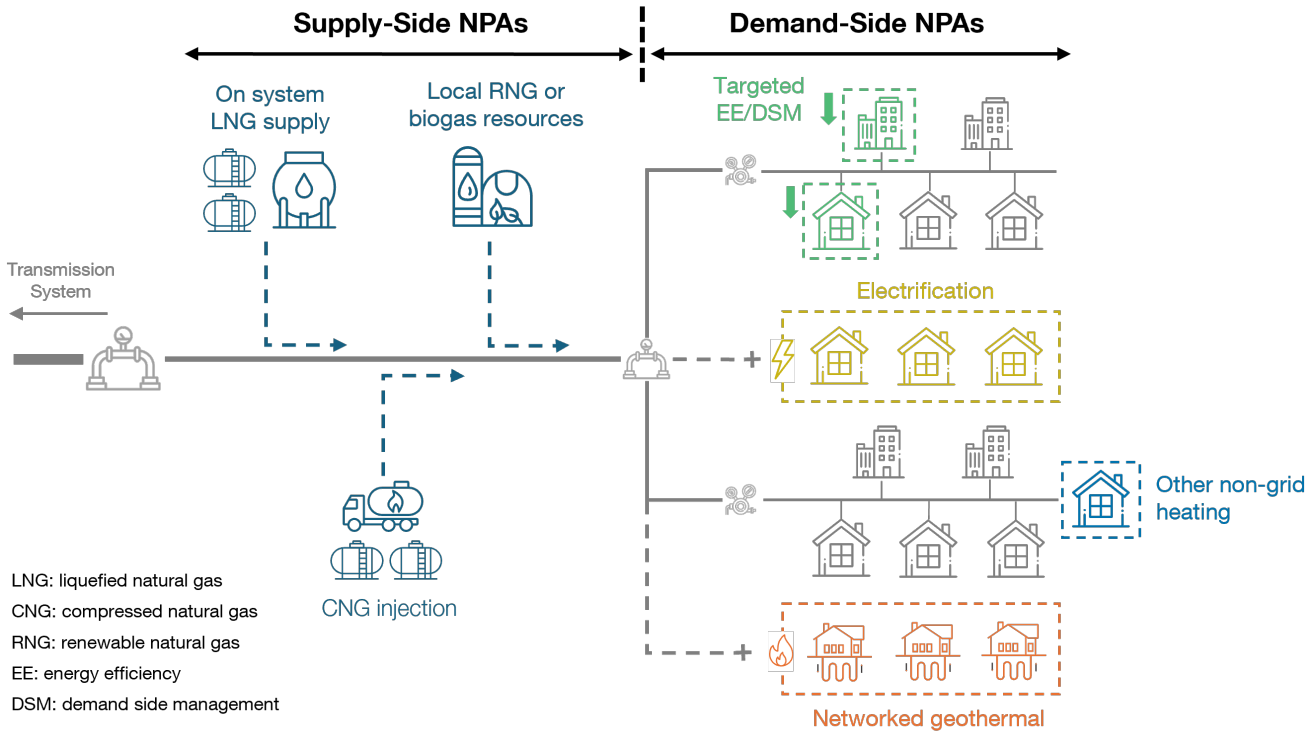
Introduction

Consideration and evaluation of Non-Pipeline Alternatives (NPAs) has emerged as a key regulatory development for gas utilities in several US states, stemming from reform efforts in natural gas planning (often dubbed “Future of Gas” proceedings). While NPA implementations to date have been sparse and largely bespoke, NPA requirements imposed on local distribution companies (LDCs) are becoming the on-ramp to reimagining gas infrastructure planning more broadly in certain US regions. The implications of NPAs for LDCs are prompting a wave of new questions and considerations such as: How might utility planning requirements evolve? What regulatory or incentive structures could encourage and reward gas utility participation in NPAs? Do NPAs represent a durable new investment opportunity, or are they simply another restrictive regulatory requirement affecting only a select few?

What are non-pipeline alternatives?

NPAs first emerged several years ago as an extension of electric “non-wire alternatives”, which were conceptualized to avoid or defer transmission-level network investments by electric utilities. NPAs refer to projects that address gas system needs by avoiding, deferring, or reducing the need to construct or replace traditional pipeline infrastructure. NPAs remain a broad category and encompass several supply- and demand-side solutions, as shown in Figure 1.

Figure 1: Examples of NPA solutions



These solutions can vary widely in their scope, costs, scale, technical feasibility or suitability, and alignment with regulatory and customer preferences. They can even be combined to collectively reduce demand or add supplemental supply capacity in a sum-of-parts fashion. However, the effectiveness of NPAs has varied widely, making it challenging to draw universal conclusions.

What is generally true is that piped natural gas service and the accompanying infrastructure are often lower cost. LDCs are highly effective at identifying and executing network upgrades for system modernization, service expansion (i.e., new customers), and capacity expansion. However, regulators, advocates, and utilities continue to explore the potential to incorporate these solutions and rethink how investments in both traditional and alternative gas infrastructure are identified, planned, evaluated, and approved in regulatory forums.

Where are NPA analyses required today?

Several states have introduced requirements for gas utilities to consider NPAs as part of their planning processes. New York, Massachusetts, California, Colorado, Washington, and Illinois have already seen LDCs submit NPA analyses to regulators. States including Maryland, Oregon, Minnesota, and Rhode Island have also begun to formalize NPA requirements. The emerging "framework" in these states generally consists of a few common steps, including technical and engineering feasibility screens, as well as an economic or cost-benefit analysis.

One area of divergence, however, is how to determine which gas capital projects should undergo an NPA analysis. Some states only apply the requirements narrowly to certain project types (e.g., capacity expansion). Other states may require proposed gas infrastructure investments above a certain capital cost threshold (e.g., $500,000) to consider and evaluate NPAs in order to be approved for cost recovery, or some combination of these criteria.

How NPAs are evolving gas infrastructure planning

The incorporation of NPA planning requirements into gas rate cases or other litigated long-term planning forums will require the LDC to "prove its pipes." Comparing traditional gas infrastructure to alternatives requires a shared or "apples-to-apples" framework for quantifying and assessing value to customers. The most obvious choice is a cost-benefit analysis that is fundamentally long term in its view and considers the full range of costs, benefits, and avoided costs for the gas infrastructure, electric infrastructure, customers, and society.

Utilities and regulators have experience developing, deploying, and interpreting cost-benefit analyses for other types of investments, particularly in the context of electric utilities. NPAs are becoming the entry point for evolving the evaluation of traditional gas network infrastructure to use a similar cost-benefit lens that goes beyond immediate gas ratepayer impacts. Evaluating NPAs often requires accounting for costs and benefits to both gas and electric utility ratepayers, including avoided investments in generation, transmission, and distribution upgrades, which is important when evaluating the impacts of electrification. Externalities like greenhouse gas (GHG) emissions (including carbon and methane) across the value chain are also valued. Quantifying reliability and the trade-offs between solutions, however, remains a nebulous challenge. For example, the value of the gas system as a seasonal energy storage asset should also be fairly valued.

Regulatory and incentive frameworks and models for LDC participation

Initial NPA pilots are under way across the US, and collaboration between gas utilities and regulators has led to the first NPA evaluation criteria. To realize the purported value of NPAs, the regulatory frameworks and incentives for gas utilities to pursue NPAs need to evolve. Utilities must have the ability to earn a fair rate of return for devoting resources to NPA investments (including financial and human capital).

NPAs tend to have several incongruencies to traditional gas infrastructure solutions, including shorter useful lives, and may include infrastructure traditionally owned by the customer rather than the utility. These are not the characteristics of assets utilities traditionally invest in. Many LDCs today are parties to energy efficiency (EE) or demand-side management (DSM) programs where these issues have been raised and addressed, at least in part.

Some regulatory solutions seek to move beyond only asset-based returns and toward performance-based, outcome-driven frameworks. It also means recognizing the value of LDCs' engineering expertise, customer engagement, and system stewardship—even if they aren't building new assets. The possible regulatory solution set is wide ranging, including:

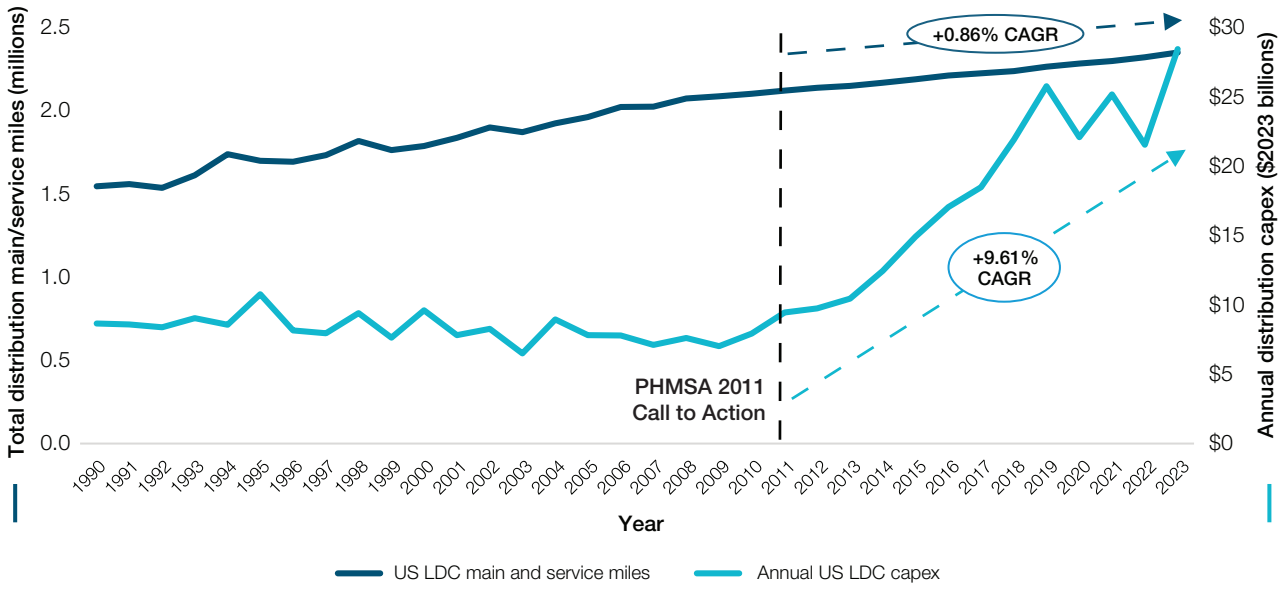
- **Performance-based incentive mechanisms:** Performance-based regulation models can reward utilities for implementing smart NPA solutions, such as return-on-equity adders or incentive payments. These incentives could value aspects such as peak demand or throughput reductions, avoided capital costs, or avoided GHG emissions, among others.
- **Capitalization or earnings treatment of certain costs:** Allow utilities to capitalize and earn a return on costs incurred for NPA programs (e.g., through regulatory asset treatment).
- **Lost revenue adjustment mechanism:** For NPA solutions that reduce natural gas sales or lead to the utility forgoing new customers, utilities can recoup lost revenues through a rider or adjustment charge so that they are "revenue neutral" to NPAs.
- **Share of savings or share of net benefits model:** Widely used in EE programs, a utility could also earn a profit or revenue share of the expected dollar savings to customers, or a share of the net benefits (quantified benefits less quantified costs), where applicable.

These and other methods have been tested and proven in other contexts, but no clear set of constructs has emerged to support LDC investment in NPAs. LDCs should evaluate what constructive mechanisms might look like for these programs and start to make this a part of the dialogue with state regulators and other stakeholders on NPAs.

Investment signal or regulatory noise?

The gas utility business in North America has evolved over more than 200 years, from the sale of manufactured gas for lighting in the 1800s to widespread natural gas distribution through the 1900s, postwar system expansion (1950s–1980s), modernization and safety upgrades (1980s–2000s), and the shale boom of the late 2010s. Total US main and service mileage in 2024 was approximately double 1984 levels, per PHMSA data (significantly above population growth). Growth in new pipeline miles, however, slowed down markedly in the 2010s, while LDC capital investment in distribution jumped in real terms as LDCs supercharged efforts to replace aging or at-risk assets in response to the PHMSA/US DOT 2011 "call to action."

Figure 2: Total US LDC distribution line miles (mains + services) vs. annual distribution capital expenditures[1]



Today, the landscape is slowly shifting. Opportunities to expand the gas distribution system to new customers, modernize aging infrastructure (such as unprotected steel or cast iron), or convert other end uses to natural gas can be more limited. Meanwhile, LDCs are looking for opportunities to deploy capital into energy delivery infrastructure at attractive risk-adjusted rates of return. In states with a regulatory emphasis on limiting gas network expansion, closely monitoring reinvestment, or improving utilization of the existing network, NPAs may become an increasingly prevalent component of gas utilities' solution set.

Many NPAs have higher capital cost requirements than traditional gas infrastructure, which is among the main barriers to implementation today. Utilities benefit from a low cost of capital and the ability to defer certain costs that can make these solutions more accessible to customers if they are found to be technically feasible, appropriate, and cost-effective. Gas utilities have the resources and expertise to contribute to planning and implementing the next phase of energy delivery infrastructure, which can include significant capital investment, but these opportunities need to be thoughtfully positioned before stakeholders and regulators.

For example, utility thermal energy networks (which can include networked geothermal systems) present an entirely new category of network investment. Several states have instructed LDCs to begin piloting these technologies, with initial network deployments under way serving a mix of residential, multifamily, and commercial customers.

[1] US LDC distribution capital spend data from AGA. US LDC distribution miles data from PHMSA.

The investment potential of NPAs depends heavily on the nature and scope of regulatory requirements and the strength of supporting mechanisms that enable LDCs to earn a competitive, risk-adjusted return. As NPAs become integrated into infrastructure plans, rate cases, or both, they will not only raise the bar for traditional gas infrastructure investments but also open new avenues for capital deployment. These investments may become more customer centric, reshaping how LDCs engage with and deliver value to their customers.

Conclusion

LDCs in several US states are likely to see an evolution in their long-term planning requirements that changes the lens through which traditional gas infrastructure is viewed and valued, requiring them to "prove their pipes" and attest to the costs and benefits of traditional solutions versus alternatives. LDCs in these states can turn a potential compliance risk into value-accretive opportunities by proactively advocating for the proper regulatory, incentive/reward, and participation structures. As LDC business and customer needs continue to evolve, utility leaders can prepare to meet the moment.

About CRA's Energy Practice

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