



The Current State of Natural Gas Utility Line Extension Policies

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Table of Contents

List of Figures	ii
List of Tables	ii
Executive Summary	iii
1. Background and Context	1
2. The Public Service Nature of the Franchise Monopoly, Universal Service, and the Policy Framework	7
2.1. Origins of the Public Service Company, The Obligation to Serve and the Regulatory Bargain	10
2.2. Financing The Obligation	19
2.3. Administrative Framework to Support Universal Service	22
2.3.1. Cost of Service Regulation	22
2.3.2. Extension of Service	24
2.3.3. Earnings Test	25
2.3.4. Abandonment of Service	26
2.3.5. Rate Design, Service Conditions, and Undue Discrimination	27
3. Natural Gas Line Extension Policies at the US State Level	30
3.1. Historical Context	30
3.2. Pricing Applications	31
3.3. Survey of Natural Gas Utility Line Extension Policies	34
3.4. Summary of Findings	37
4. Conclusion	38
References	39
Glossary	46
Appendix 1: Specific Gas Utility Line Extension Practices	50

List of Figures

Figure 1: Natural Gas Prices and Consumption by Sector	1
Figure 2: CO2 Emissions by Major Sector	3
Figure 3: The Policy Framework of Public Service Company Regulation	10

List of Tables

Table 1: Line Extension Approaches and Policy Levers for Natural Gas Utilities	34
Table 2: States with Statewide Line Extension Policies	35
Table 3: States with Non-uniform Line Extension Policies	36

Executive Summary

This report examines the existing relationship between public service companies and public policy in the natural gas industry, focusing on the regulatory framework that guides the provision and expansion of essential utility services. Of particular interest are natural gas utility line extension policies governing the responsibilities of customers and utilities in expanding the natural gas infrastructure to accommodate new customers. Line extension allowances, which offset some or all costs of connecting a customer to the natural gas system, have been crucial for ensuring fair access and economical pricing of these essential services. Yet pressures from shifting sensibilities, policies, and regulations are calling into question the current methods of setting prices for line extensions. Removing or otherwise limiting line extension allowances may result in additional upfront costs for new customers and a shifting of the benefits of new natural gas connections from new customers to the existing customer base (i.e., cross-subsidization).

We document the changes, or potential changes, to these policies as regulators in a few jurisdictions begin to contemplate changes in longer-term planning for natural gas utilities in response to evolving public policy to reduce greenhouse gas emissions while also addressing expanding energy consumption and the need to maintain the safe, reliable, resilient energy systems that provide non-discriminatory service at reasonable cost.

The report provides vital insights for stakeholders involved in examining these policies, offering a comprehensive analysis that supports informed decision-making and strategic planning in the utility sector.

Report Highlights

Utility services underpin our economy and way of life. Without *utility* services, basic living standards today might not differ markedly from two hundred years ago. The mass provision of infrastructure services—transportation, water, energy, and communications service—supports and in many ways defines economic growth and activity, indeed, the entire modern lifestyle.

The entities providing these services are commonly called utilities or *public service companies*. Yet the provision of those services and the public service companies providing those services continue to evolve. For example, the communications services industry today has little in common with the industry that merely forty years ago was dominated by one public service

company. Natural gas, and to some extent electricity, is now sold in liberalized markets, though the basic delivery networks operate much like the networks of years past.

These infrastructure industries, however, did not develop and evolve solely by private means. Public policy supported access to essential energy sources and economic development largely enabled by the expansion of utility infrastructure networks. Public policy also implemented regulation and, eventually, liberalization of that regulation over time when it was found to support the public interest and not diminish access to energy or utility services. This report focuses on the juxtaposition of the public service company and public policy, namely as it pertains to the natural gas industry.

This research begins with an examination of the development of the public service company's legal duty to provide service to the community. We find that the regulatory framework has its origins in English common law, as applied by U.S. courts of the nineteenth century. By the early twentieth century, the concept of the public service company was codified by legislation preserving common law principles and laying out in a more ordered and particular manner the duties of public service companies including, notably, the obligation to serve, charge reasonable prices, and provide non-discriminatory service in a safe, reliable, and resilient manner. In return, the utility receives fair compensation and a protected service territory.

This framework continues to this day as a means for governments and regulators to implement legislation and regulation to provide necessary services for citizens to live a modern life. The obligation to extend service is one part of an integrated regulatory framework (which includes the provision of safe, reliable, resilient, nondiscriminatory service at reasonable cost) emphasizing the obligation to serve as many citizens as technically and economically possible.

We categorize four primary principles of the public service obligation:

- (1) service and service extension.
- (2) service abandonment.
- (3) pricing, including, and importantly, ensuring avoidance of long-term cross-subsidies between customers; and

- (4) ensuring utility access to adequate capital to support service provision (this report terms this the *earnings test*)

These principles all have a direct effect on the core question of this research, namely the provision of natural gas utility service and its extension to new customers. Regulators have developed line extension policies that are designed to:

- Treat new customers in a non-discriminatory manner by creating a transparent compensation scheme for extension of service.
- Treat existing customers and the utility fairly by avoiding long-term cross-subsidies by requiring new customers to compensate the utility for costs that exceed the likely revenues from providing the service.
- Provide economic incentives for rational expansion of the utility system while avoiding uneconomic expansion.

The report then presents a survey of line extension policies. *Line extension* is defined as the expansion of natural gas utility service to new customers where the utility must install additional facilities to connect a customer. Most line extension practices in the U.S. for natural gas utilities use some form of an allowance process that offsets some or all costs of connecting a customer to the natural gas system. Typically, the allowance is calculated as a physical extension (e.g., 100 feet) or a dollar amount. A dollar amount is generally calculated on future expected revenues, a fixed level of cost in dollars, or a multiple of expected revenue (or margin) over a set number of years.

Once the allowance is calculated, if the line extension cost exceeds the allowance, this *excess portion* is charged to the customer either as an upfront payment to aid the construction of the extension or as a surcharge recovered over a set period. This approach to line extensions is largely an implication of the basic pillars of the regulatory framework, namely the earning test—revenues from new customers should provide reasonable assurances of cost recovery—and the

policy of providing service to customers based on reasonable prices, which includes avoiding cross-subsidization of the new customers by other customers on the system.

While line extension policies vary among natural gas utilities, traditionally, the guiding principle is to ensure that extending service to new customers benefits existing customers through spreading fixed costs among a larger customer base. Line extension policies were designed to help ensure that this beneficial cost-spreading effect occurs without cross-subsidies from existing customers to new customers while allowing the utility to provide equitable non-discriminatory service with a level of investment commensurate with the incremental revenues from the new customers. Therefore, the removal or reduction of line extension allowances may lead to a shift of benefits from new customers to the existing customer base and, paradoxically, government-imposed inequitable service, access to energy and the potential for economic growth.

The report documents the changes, or potential changes, to these policies as regulators in a few jurisdictions begin to contemplate changes in longer-term planning for natural gas utilities in response to evolving public policy to reduce greenhouse gas emissions.

Today regulation and the public service company itself are under pressure to evolve. The concern over greenhouse gas emissions has led to changes and innovations in policy, regulation, and technology. This could also potentially change the focus of the delivery portion of the natural gas utility industry as changes in policy, technology, and consumer preference lead to shifts in market demand. While some of the impetus for fuel source switching undoubtedly lies in the cost structure of the most recent vintage of renewable energy sources, it is indisputable that government policy has nudged the industry in this direction.

As a result, current policy discussions in some jurisdictions are contemplating an evolution of the role of natural gas utilities in providing delivery of energy. In a few cases, stakeholders are proposing a reexamination of the purpose of the public service company and its role in providing mass-scale, necessary natural gas utility services to both existing customers and new customers. Such proposals should consider how the pillars of regulatory service, including safe, reliable, resilient service provided in a non-discriminatory manner at a reasonable cost, will

continue. This is of particular importance to those who may still wish to obtain natural gas service either because the service is lower cost or higher quality than the alternative. This report is intended to provide a basic starting point for future discussions of the role of line extension policies in the natural gas industry.

1. Background and Context

The natural gas industry has undergone meaningful change since the late 1970s energy crisis. In its third annual report to Congress in 1979, the Energy Information Administration sounded an alarm concerning the future of natural gas:

In the middle oil price series, natural gas production declines slowly through the rest of this century. After 2000, depletion of the resource coupled with increased competition of synthetic fuels causes natural gas production to fall more rapidly...The reemergence of gaseous fuels made from coal begins midterm period (1985 to 1995) and becomes an important fuel in the long term (2000 to 2020). (EIA, 1979, pp. x-xi).

By the 1990s, natural gas production was less of an issue with the expectation that the Alaskan Natural Gas Transportation System (ANGTS) would deliver over 800 billion cubic feet of gas per year by 2005. (EIA, 1990, p. 25). Despite the availability of natural gas, the high cost of ANGTS gas was expected to increase the wholesale price to as much as \$6.09 in 1989\$ (\$15.50 in 2023\$) per mmbTU by 2010. (Id.) The ANGTS, of course, did not provide the expected supply, yet natural gas prices, while volatile, have been remarkably moderate over the long term with two notable price spikes occurring from 1979 to 1985 and a second, more extreme spike lasting from 2003 to 2008. (See Figure 1)

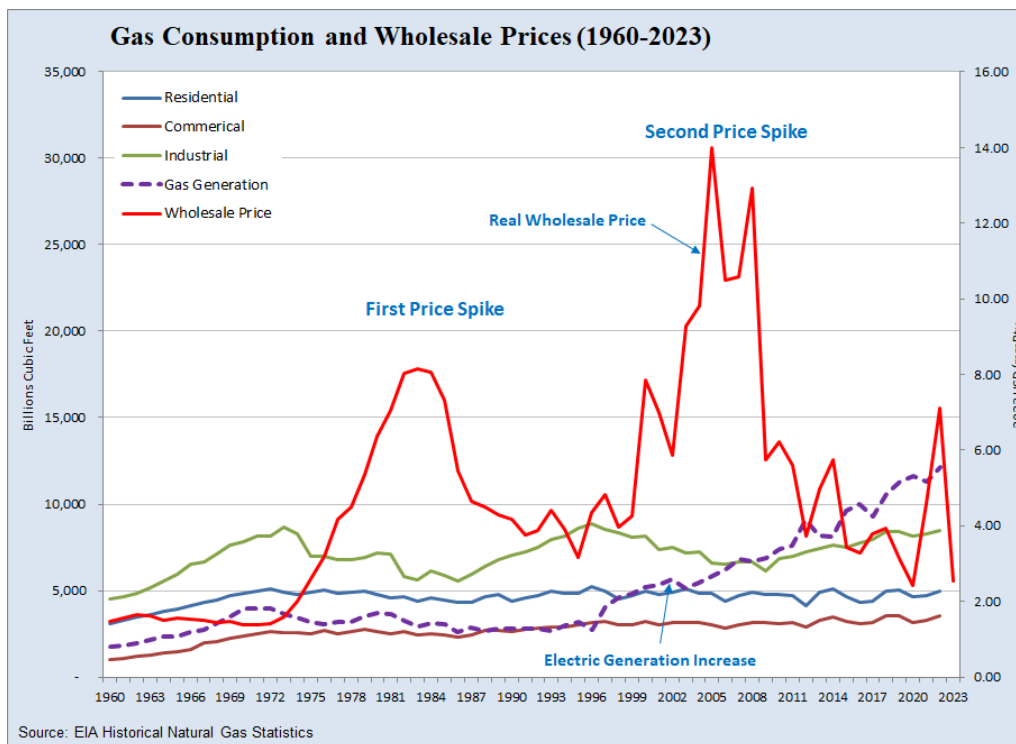


Figure 1: Natural Gas Prices and Consumption by Sector

By the early 2010s, and with the growth of shale gas, the (real) price of natural gas fell back to the post-FERC Order 636 historical levels and, except for geopolitical disruptions in 2022, has largely remained there.¹ Even as the external costs of energy production began to influence policymaking in the early 21st century, namely through the movement away from coal-fired electricity production, natural gas was largely considered a *bridge fuel* that would usher in a *transition period* of reduced emissions due to a switch from coal to natural gas—buying public policymakers additional time to catch up with the serious issues of constraining carbon emissions. A 2013 study stated the proposition this way:

Environmental experts and advocates have long viewed natural gas as a critical driver of the shift from coal toward lower-carbon energy sources. Widely referred to as a “bridge fuel,” natural gas proponents argue it is one of the lowest-cost and most easily substitutable alternatives to coal. Because it produces roughly half the CO₂ emissions of coal, natural gas has been embraced as a bridge fuel to zero-carbon energy supplies by Al Gore, the Sierra Club, the Natural Resources Defense Council (NRDC), Resources for the Future, former Environmental Protection Agency head and Obama climate chief Carol Browner, and energy experts across the political spectrum. (Trembath Et al., 2013, p. 11, cited by Costello, 2017, footnotes omitted)

Indeed, this appears to have happened quite dramatically and quickly. Figure 2 illustrates the extraordinary decline in emissions from coal. Emissions from coal-fired generation fell from its maximum in 2007 to more than 1,100 million metric tons by 2022. Over the same time, natural gas-fired generation increased by less than 300 million metric tons, illustrating the “bridging fuel” strategy noted above.²

¹ FERC Order 636 (1992) separated the pipeline delivery business from the sale of commodity. While the wholesale price of natural gas had been liberalized in the late 1970s, the pace of liberalization was slow. Pierce (1995) provides a brief history of gas policy through FERC Order 636.

² Data from [EIA Monthly Energy Report](#).

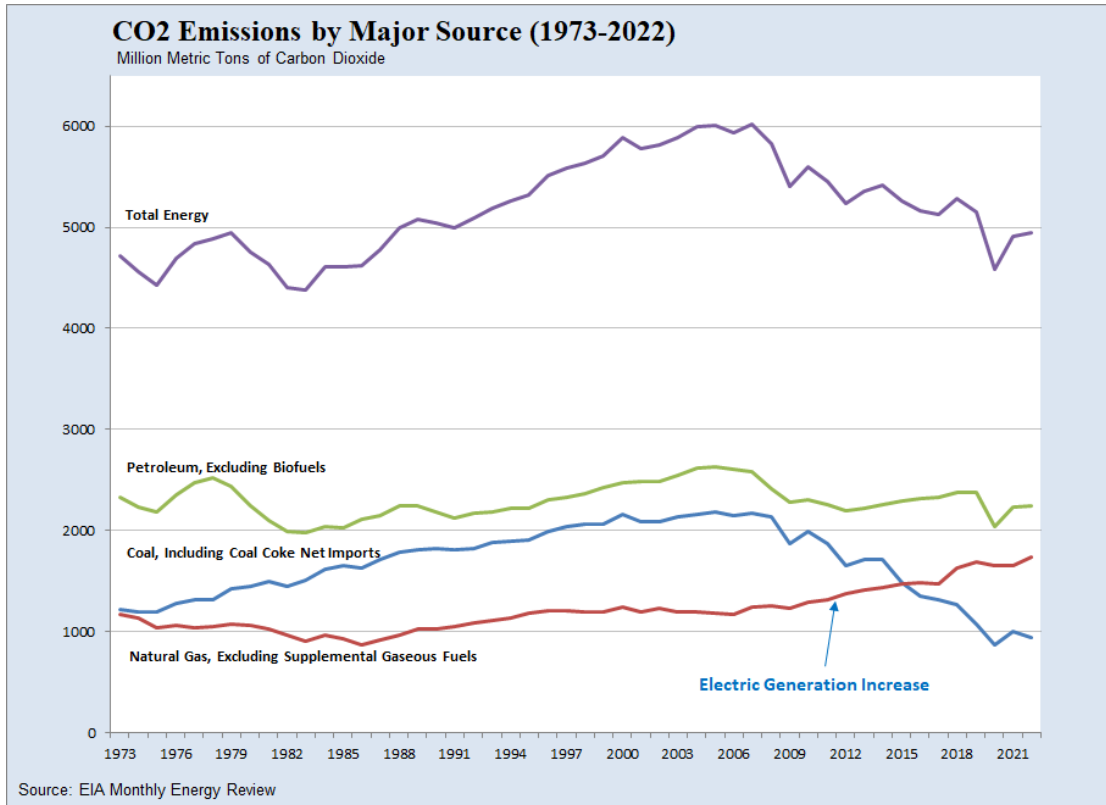


Figure 2: CO2 Emissions by Major Sector

By the early 2010s, many, including natural gas delivery companies and regulators, saw gas as a viable energy supply alternative to higher carbon or higher cost fuels. Costello (2013a) even noted that:

...the low price of natural gas in the U.S. has sparked interest in growing the use of this energy source. One example of this growth is residential, business, agricultural, and industrial energy consumers wanting to switch from oil, propane, and other fuels to natural gas. Many of these consumers reside in urban and suburban areas that previously had no access to natural gas, while others live in rural areas that still do not have access to natural gas.

At the time, some analysts saw natural gas serving two useful purposes: helping the transition to a cleaner energy economy while providing consumers with a valuable public utility service relative to alternative fuels. Over the next decade, however, attitudes toward natural gas

functioning as a *bridge* fuel began to evolve.³ Driven by concerns over climate change, the dramatic reduction in emissions from coal sources, and the long-term nature of gas infrastructure, some advocates now reject the bridging hypothesis in favor of absolute decarbonization. (See *e.g.*, Alter et. al, 2021).⁴ Questions concerning natural gas planning, emissions reductions from end use applications of natural gas, and policy toward line extensions have been, or are currently being, addressed by some regulators through so-called *Future of Gas* proceedings. These proceedings also often address the implications for affordability when using regulatory policy to reduce emissions from end-use gas applications.⁵ California regulators have recognized the balancing act required between addressing the serious concerns regarding the issue of climate change and mitigating the effect of fluctuating energy prices on the ability of consumers to affordably meet their basic needs.⁶ Part of the issue with affordability must certainly lie in the very reason for regulated monopoly service provision. In practice, utilities, and especially natural gas utilities, spend significant sums on infrastructure that, for all practical purposes, are sunk. Public policy—the granting of a franchise monopoly—presumes that rates

³ The concept of a *bridge* fuel is largely associated with the reduction of emissions from the power sector, though fuel switching from oil, or other fuels, in gas end-use applications is also part of the bridging strategy. Whether that strategy was intended as an end or a means is a different question. Many current electrification policies are aimed broadly at the transportation sector though some federal and state policies include or may lead to fuel switching for end use applications such as water and space heating.

⁴ It seems likely that electrification policies, including those aimed at the natural gas industry, are, at least in part, motivated by the substantial decrease in emissions from the electric sector over the past decade. See *e.g.*, Holland Et. al (2020) for evidence of the decrease in emissions and Davis and Hausman (2022) for a general discussion of the movement toward electrification.

⁵ In the US Department of Energy’s 2020 Residential Energy Consumption Survey 27 percent of consumers reported some energy insecurity and nearly 20 percent reported reducing or eliminating spending on basic necessities to pay energy bills. (<https://www.eia.gov/todayinenergy/detail.php?id=51979>) Davis and Hausman (2022) estimate the effect of a shrinking asset base from the gas transition on remaining customers. Aas Et. al (2020) model electric and gas retail rates based on various decarbonization policies for California. The Massachusetts Department of Public Utilities recognize the potential negative effects on customers of transitioning away from natural gas. To address the problem, first the costs of transition are quantified with resulting impacts on customers evaluated then innovative solutions are developed—including solutions that the regulator currently has no statutory authority to implement—for addressing both energy justice and alternative methods of cost recovery are evaluated. See *Massachusetts D.P.U 20-80-B*.

⁶ On August 31, 2023, the California Public Utilities Commission (“CPUC”) authorized a substantial increase in the natural gas storage at the Aliso Canyon storage facility to “guard ratepayers from...natural gas price spikes.” (“CPUC Takes Action to Enhance Energy Affordability For Ratepayers in Southern California.” Press Release, CPUC.) This step was taken while the CPUC related its intention to release a plan to “reduce the state’s reliance on Aliso Canyon.” (Id.)

are minimized, and service offerings maximized, when these costs are spread over a larger number of units, whether number of customers or the quantity of sales. Expanding the customer base, when priced correctly, contributes to this *cost-spreading effect*.⁷ Reversing the trend by incenting the natural gas utility customer base to shrink, naturally, leads to *higher* short-run average costs and, consequently, prices.⁸ Squaring the circle on affordability questions is a primary concern of natural gas policy today.

The remainder of this report focuses on one issue in this great debate: line extension policies. Line extension policies refer to the expansion of natural gas utility service to new customers where the utility must install additional facilities to connect a customer. These policies may prescribe a specific approach to hooking up new customers or create a process by which an evaluation is completed as to whether service is economic to extend to new customers and at what price. Presumably, one reason line extension policies fit into the *Future of Gas* is that new customers consume additional natural gas which fuel switching, if the new fuel source is renewable-heavy electricity, could avoid.⁹ A second, more practical reason, concerns the recovery of utility infrastructure costs. If the natural gas industry is in a transition period, which may result in significant reductions in natural gas sold at retail, existing and future expansion of infrastructure is at risk of becoming stranded if the price of gas delivery increases and customers begin to switch to other fuels. As played out in the restructuring of the electric industry in the 1990s, utility investment, when prudently incurred, has a strong claim on cost recovery.¹⁰

⁷ The *cost-spreading effect* is a short-run phenomenon that refers to the reduction of short-run average cost as output increases. This is distinct from *economies of scale* which is a long-term concept related to the technologies of production and the shape of the long-run average cost curve.

⁸ As Davis and Hausman (2022) show “...utilities add pipelines but rarely remove them...” This is not particularly surprising since the sunk investment in pipelines typically has no practical alternative use.

⁹ If the fuel switching includes market driven technology shifts (e.g., heat pumps for forced air gas heating) and low-cost renewables enter the market in the coming years then the switch to electricity could produce significantly lower carbon emissions. See e.g., Pistochini et al. (2022)

¹⁰ Hammond and Rosi (2017, p. 658-659) summarize the practical approach to stranded cost recovery by noting that “...courts were not receptive to legal claims that the Constitution required full compensation...[yet]...regulators found ways to help mitigate the standard costs impacts on firms...” This practical approach dates back centuries. See e.g., *infra* note 21. For a contra approach, see *Proprietors of the Charles River Bridge v. Proprietors of the Warren Bridge*, 36 U.S. 420 (1837).

Recently, the Massachusetts Department of Public Utilities reinforced this notion as it applies to the *Future of Gas* while putting utilities on notice that future investment will face greater scrutiny.

As we chart the path for this transition, we emphasize that nothing we do here is intended to jeopardize the rate recovery of the billions of dollars of existing investments in natural gas infrastructure by the LDCs operating within the Commonwealth. Traditional notions of the regulatory compact continue to apply to those investments and, accordingly, there generally must be some demonstration of imprudence before recovery of existing investments can be challenged. At the same time, however, it is fair to say that a different lens will be applied to gas infrastructure investments going forward. The Department will be examining more closely whether such additional investments are in the public interest, given the now-codified commitment toward achieving Commonwealth's target of achieving net-zero GHG emissions by 2050 and the urgent need to address climate change. (Massachusetts D.P.U *supra note 5*, p.14)

The purpose of this report is to provide stakeholders and the broader regulatory community with a factual recitation of the basic nature of the regulation of public utilities as it has developed in the United States to provide a public policy foundation for understanding why natural gas line extension policies exist in current form. The report then provides a survey of the existing policies for line extensions by categorizing the approaches and providing a database of policies at the state (or utility) level. The intention of this report is not to advocate for a particular approach to line extension policy, rather it is to provide a level-setting document that can serve policymakers and stakeholders as these important issues continue to receive attention. To begin this discussion, however, the report starts with the essential nature of the public utility concept and the regulatory policy framework that developed in support of providing universal service to customers.

2. The Public Service Nature of the Franchise Monopoly, Universal Service, and the Policy Framework

As cited above, Costello (2017) contends that some customers, who would otherwise prefer to use natural gas, may have no *access* to natural gas. Jones (1979, pp. 426-427) relates this principle of *access* to the concept of a public service company:

[A public service company is]...financed by private capital and managed by private individuals, engages in commercial activities subject to distinctive public constraints...[T]he core of the concept is that the public service company will make its services available on fair and equitable terms to all customers in the area it undertakes to serve.

This *core concept* of the public utility company distinguishes it from purely private firms. The obligation to serve is integral to the policy of supporting economic development and the general welfare of the public. As Justice Frankfurter observed:

No task more profoundly tests the capacity of our government ... than its share in securing for society those essential services which are furnished by public utilities. Our whole social structure presupposes ... dependen[ce] upon private economic enterprise. To think of contemporary America without the intricate and pervasive systems which furnish light, heat, power, transportation, and communication is to conjure up another world. (Frankfurter, 1930, p. 81)

Indeed, as discussed in more detail below, universal service has a long history in the United States predicated on the belief that progress and economic development required access to basic services on terms that would not arbitrarily exclude broad portions of the public. In its early years, the newly independent United States government was short on capital, yet leery of the corporate entities granted privileged monopoly by the monarchy.¹¹ Adams (1887) documents

¹¹ After all, in December 1773, tea owned by the East India Company, originally formed as *Governor and Company of Merchants of London trading into the East Indies* under a royal charter granted in 1600 by Queen Elizabeth I, found its way into Boston harbor. This distrust of monopolies, especially those that provide necessities of life, is probably no more obvious than in a Connecticut Law from 1776 which states “[M]onopolizers, the great pest of society, who prefer their own private gain to the interest and safety of their country, and which if not prevented threaten the ruin and destruction of the state.” (Cited in Khan, 2011). Letwin (1965) documents the early mistrust of privileged entities granted special rights and

the concern of the first century of the American experiment as a contradictory, or perhaps complementary, fear of powerful corporate interests and government that becomes corrupt. As a result, grants of monopoly and privileged corporate status were limited to entities dedicated to *public* service.

It is not hard to understand why the public service company was charged with an obligation to serve customers on a non-discriminatory basis. If a company provides a service central to modern living, such as basic infrastructure, it becomes incumbent upon the state to regulate the provision of the service such that service is provided to all.¹² If this were not the case, some customers, e.g., those in more rural or suburban areas or in moderate- or low-income areas might not have uniform access to this modern necessity. Moreover, the providers may charge different prices or use different terms and conditions to otherwise similar customers. Society accepts that some customers might not have ready access to a Michelin Star restaurant or a Major League Baseball team since these services are not crucial to *promote the general welfare*. Yet society has an interest in ensuring that basic services of modern life are available to the public at large. To achieve these ends, policies were developed regarding all aspects of the provision of public services to assure that the public, to the extent possible, did not suffer adverse effects from less than adequate and widely available service.¹³ These policies include extension of service into new or unserved areas along with abandonment of service and avoidance of cross-subsidies, unless explicit policy goals are met, combined with the policy toward assuring that the provider was offered an opportunity to receive fair compensation for the cost of providing services meeting these goals, including the cost of obtaining the necessary capital. This set of

relates this to the focus on regulating the practices and behaviors of these entities which ultimately led to passing of antitrust laws aimed at minimizing the harms from concentrated ownership of resources. *Also see* Maier (1993) or Wright (2010).

¹² In *Munn v. Illinois* (1876) the US Supreme Court enshrined the practice of allowing regulation of certain private property “when necessary for the public good,” since the property owner “grants to the public an interest” in the property when it is devoted “to a use in which the public has an interest.”

¹³ The “Internet for All” initiative, for example, is designed to address the issue of the expansion of broadband access to a large sector of the American public currently either underserved or unserved based on the premise that internet access is essential for participation in the modern economy.

policies constitutes the basic framework for the regulation of the public service company. Figure 3 illustrates this policy framework along with the outcomes.

The *Cost-of-Service Regulation (COSR)* method of ratemaking, including the foundational *regulatory equation* relating the total cost of providing service—operational costs, overhead, and capital costs—to the overall allowed revenue was developed to implement the practical aspect of setting prices for the provision of services and, as such, has implications for the obligation to serve. (See Section 2.3.1).

Regulatory Equation:

Revenue Requirement = Rate Base * Weighted Average Cost of Capital + Operations and Maintenance Expense + Administrative and General Expenses + Other Allowed Expenses including Taxes

The cost aspect of the regulatory equation is predicated on the utility meeting the policy goals of the framework in Figure 3 while supplying the necessary services in an efficient manner by prudently managing the company and investment of resources. The revenue side of the equation is recovered through the rates. Over the past one hundred years, the COSR framework evolved into a comprehensive mechanism to coordinate investment, return, services, and expansion to all potential customers. Pursuant to its obligation to serve, the public utility cannot limit supply only to the most profitable customers. As a result, regulators generally use *postage stamp* pricing at average cost to support community-wide service by grouping similar customers together in *rate classes*.¹⁴ By supporting fair total returns, utilities have access to the necessary capital allowing the build out of the system to serve all citizens and enabling the utility to bear the responsibility of providing territory-wide service.

¹⁴ The term *average cost* is not meant in its strict economic sense. Generally, the average cost that regulators use is the revenue allocated (i.e., a portion of the revenue requirement) to a particular customer class divided by the units sold. The units are generally the number of customer bills, the volume throughput and, for some customers, the maximum throughput. The final rates are typically a customer charge, a volumetric charge, and for some customers, a demand charge.

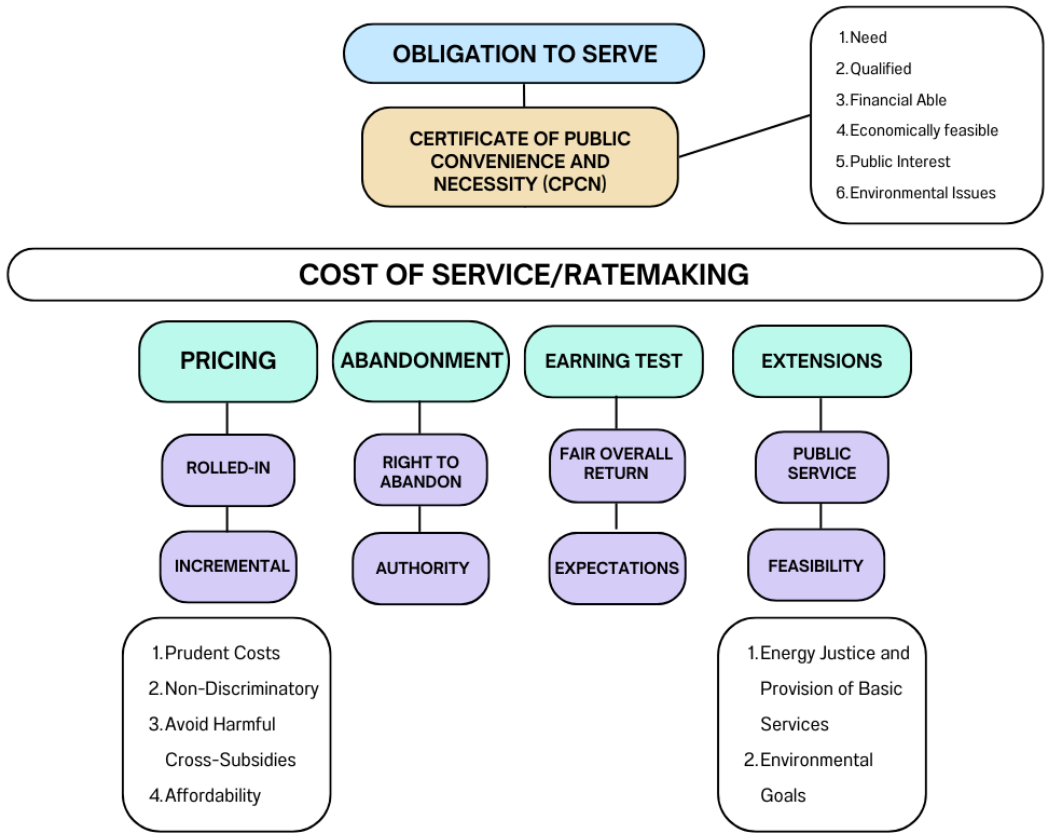


Figure 3: The Policy Framework of Public Service Company Regulation

2.1. Origins of the Public Service Company, The Obligation to Serve and the Regulatory Bargain

Historically, the law treated those entities with a *common calling* differently from those that were merely private entities. A common calling referred to those engaged in a common occupation, e.g., innkeeper, as opposed to those who did not possess the common skills of the occupation. Sir William Blackstone summarizes the English common law on this point:

[T]here is also in law always an implied contract with a common innkeeper, to secure his guest's goods in his inn; with a common carrier or bargemaster, to be answerable for the goods he carries; with a common farrier, that he shoes a horse well, without laming him; with a common taylor, or other workman, that he performs his business in a workmanlike manner; in which if they fail, an action on the case lies to recover damages for such breach of their general undertaking. But if I employ a person to transact any of these concerns, whose common profession and business it is not, the law implies no such general

undertaking; but, in order to charge him with damages, a special agreement is required. Also, if an innkeeper, or other victualler, hangs out a sign and offers his house for travellers, it is an implied engagement to entertain all persons who travel that way; and upon this universal *asstumpsit* an action on the case will lie against him for damages, if he without good reason refuses to admit a traveller.¹⁵

This implies a duty to serve, to provide adequate service on reasonable terms, and in a non-discriminatory manner. (Burdick 1911a, p. 515). Singer (2020, p. 622-623) notes that Blackstone was the source for much of the nineteenth century American understanding of common law and, as such, the American common law of the time imposed these obligations when one engaged in a *common calling* by “holding oneself out as ready to provide services...” As for the case law, Singer (1996, p.1304) cites an early case, the 1586 *White’s Case*, holding that innkeepers had a duty to serve when their inns were not full but suggests the “leading English case cited...in the nineteenth century in the United States, is *Lane v. Cotton*.” This 1701 case concerned the liability of Sir Robert Cotton, post-master general, for the loss of eight Exchequer bills in the post. Lord Holt, in a dissenting opinion, found a duty to serve in public employment similar, if not stronger, than the common calling:

...whenever any subject takes upon himself a public trust for the benefit of the rest of his fellow-subjects, he is *eo ipso* bound to serve the subject in all the things that are within the reach and comprehension of such an office ... If on the road a shoe fall off my horse, and I come to a smith to have one put on, and the smith refuse to do it, an action will lie against him, because he has made profession of a trade which is for the public good ... If an innkeeper refuse to entertain a guest where his house is not full, an action will lie against him...and so against a carrier, if his horses be not loaded, and he refuse to take a packet proper to be sent by a carrier... one that has made profession of a public employment, is bound to the utmost extent of that employment to serve the public. 88 *Eng. Rep.* 1378-1865

Burdick (1911a, pp. 521-522) argues the duty of a public official to discharge their office for the benefit of the public in a prudent manner led English courts to impose upon common

¹⁵ This quote from Blackstone’s *Commentaries on the Laws of England* appears in many papers on this topic. See e.g., Burdick, 1911a.

callings a duty like that of a public servant. This idea of the *common carrier* being in the public employment dates further back.¹⁶ For our purposes here, *Jackson v. Rogers (1683)*, is an important case since it relates to a carrier of goods with some market power. Due to the risk inherent in carrying goods between regions of England at that time, goods were transported by carriers who were able to mitigate these risks.¹⁷ The costs of doing so, however, gave the carrier a virtual monopoly and, as such, users of these services could not rely on competitive markets to assure services were provided at a reasonable price and turned to the law for protection.¹⁸ Probably the most well-known articulation of these principles comes from the pen of Sir Matthew Hale, Chief Justice of the King's Bench, near the end of the seventeenth century. While summarizing the common law on this topic, he notes that if a business, in his example a wharf or crane, has either a franchise granted by the *Sovereign* or is a monopoly, "...there cannot be taken arbitrary and excessive duties for crantage, wharfage...neither can they be enhanced to an immoderate rate, but the duties must be reasonable and moderate...[F]or now the...[entities]...are affected with a publick interest, and they cease to be *Juris privati* only." It is probably not an overstatement to suggest that *affected with a public interest* is the single most important concept in the regulation of public utilities.¹⁹ Changes in the economics and

¹⁶ A series of cases extended common carrier liability to barge operators (*Rich v. Kneeland*, Cro. Jac. 330, 79 Eng. Rep. 282 (K.B. 1612), masters of ships (*Mors v. Slew*, 2 Keb. 866, 84 Eng. Rep. 548 (K.B. 1672), and stagecoach operators (*Lovett v. Hobbs*, 2 Show. 127, 89 Eng. Rep. 836 (K.B. 1680). Cases cited in Kaczorowski (1990).

¹⁷ This discussion relies primarily on Beale and Wyman (1915, pp. 7-8).

¹⁸ The question of whether market power was the prime motivation behind the common law imposing duties on common carriers is beyond the scope of this discussion. Some argue that the *monopoly* aspect was the key to the obligation to serve and other duties of a common carrier that, today, seem more like the public utility concept. See e.g., *Allnut v. Inglis* (1810).

¹⁹ Lord Hale's summaries appear to have had negligible effect on English legal opinion until the early nineteenth century. Blackstone, writing nearly one hundred years after Hale's original manuscript was authored, makes no mention of Hale's account, nor of *affected with a public interest*. Hale's manuscript laid largely dormant until the late 1780s when Franis Hargrave published it as part of *Collections of Tracts Relative to the Law of England* to "an indifferent bar." (McAllister, 1930, p. 759). Though perhaps as important as Hale's *affected with the public interest* declaration is his conclusion that common carriers, when charging prices to the broader public, are effectively granted a franchise subject to the control of the legislature. See *Young v. Harrison* (1849) citing *Lansing v. Smith* (1829) ("even the taking of a common wharfage, or toll at a ferry, is a franchise, subject to the control and regulation of the legislature, and cannot be lawfully exercised without their permission.")

technology of business caused courts to begin to apply Hale's concept in more nuanced ways.²⁰ For example, the simple act of *holding oneself out to serve the public* ceased to imply an obligation to serve for a broad set of entities, save those deemed *common carriers*—businesses that provided some form of conveyance services on land and water—likely because these entities were broadly important to the functioning of the economy and, following Lord Holt's logic, by analogy, these entities acted as if in public employment.²¹

The *entity* affected with the public interest, as Hale notes, is different from a purely private entity due to its position. A wharf that only takes goods not subject to custom is a private entity. A wharf, however, for which *all persons that come and unlade or lade their goods* represent a different kind of entity due to its position of affecting *all persons*. It was with this background that the foundational case came before the U.S. Supreme Court. In *Munn v. Illinois*, the question before the court was an Illinois statute that provided for the setting of the rates for grain elevators in the City of Chicago. The *Munn* majority, based on the *Hale* premise, agreed that the grain elevators represented a bottleneck in which the grain from the West flows to markets in the east leading to the conclusion that “if any business can be clothed ‘with a public interest’ and cease to be *juris privati* only, this has been.” Later cases upheld the *Munn* majority allowing businesses that might not otherwise take on the roll of *public servant* may, nonetheless, be given that role by statute.²² *Munn* then stood for the conclusion, it would seem, that when a business becomes of great importance to the public *and* has a monopolist tendency, this justifies the use of state *police powers* in regulating the entity.

²⁰ The evolving competitive market structure, because of evolving economies, began to substitute for administrative remedies.

²¹ Ferries were often identified as entities *affected with a public interest* likely because Central London had only one bridge (London Bridge) for nearly 600 years until 1729. During this time, ferries on the River Thames operated like a bridge, leading courts to treat them like a bridge. It was not until 1750 that the Westminster Bridge was opened upstream of London Bridge, yet to counter commercial opposition to the new bridge, Parliament authorized compensation to operators of ferries, including the Archbishop of Canterbury, of nearly £50,000 (roughly £14 million £2023).

²² Kahn (1988, p.3) cites banks, fire insurance, grain elevators, insurance agents, among others, that were, at one time, included in this domain of those affected with the public interest. Hamilton (1930, p. 1089-1090) identifies theater ticket brokers, employment agencies, and gasoline stations as excluded from this group.

Basic common law principles may well impose *ordinary* duties to serve on a broad range of entities, public utilities, are in a special class for which the obligations are *extraordinary*. By the early twentieth century, the application of duties for public utilities was easily summarized:

Under the common law those engaged in public callings were required to furnish reasonably adequate service and facilities. Statutory regulations have superseded the common law and, taken over that legal standard; also, regulatory provisions relating to specific matters of service have been enacted. Administrative commissions are charged with enforcing specific legislative requirements, and are given a discretion only in regard to the application of the general standard. The general and special provisions of these statutes, relating to public utility service, gives the commission complete power over the subject. Service and rates are very closely related. Commissions have the power to require adequate service only in case of a proper return; it cannot, under the guise of regulation, require a utility to expend large sums of money for the extension of its service into a new territory when the necessary result would be for the corporation to use its property for public convenience without just compensation. (Cox, 1932, p. 140)

Once the entity is considered a part of this special class of businesses affected with, and beholden to, the public interest, a kind of bargain is struck between the state and the entity which requires extensive duties but provides special benefits such as the just compensation for the use of its property to serve the public. Indeed, utilities are generally granted some type of franchise by legislation and with it, special privileges such as eminent domain.²³ In the late nineteenth century, the U.S. Supreme Court noted the connection between the privileged franchise and the granting of the privilege through legislation:

What is a franchise? Under the English law, Blackstone defines it as "a royal privilege, or branch of the King's prerogative, subsisting in the hands of a subject." ...a franchise is a right, privilege, or power of public concern, which ought not to be exercised by private individuals at their mere will and pleasure, but should be reserved for public control and administration, either by the government directly, or by public agents, acting under such conditions and regulations as the government may impose in the public interest, and for the public security...No private person can take another's property, even for a public use, without such authority, which is the same as to say that the right of eminent domain can

²³ The distinction between the *grant* of the franchise and *regulation* by the franchise is an important one, though one beyond the scope of this discussion. See e.g., Jones and Bigham, 1931, Chapters III and IV.

only be exercised by virtue of a legislative grant. (*California v. Central Pacific R. Co.*, 1888)

The creation of these *public agents* transforms the nature of the business relationship with customers. Harkening back to Lord Holt, the obligations imposed upon these entities extend beyond simple provision of services to all at reasonable rates and have, over time, expanded to include gas transportation services, requests for interconnection, purchase of customer-produced electricity, provision of energy efficiency, provision of discounted service for vulnerable consumers, and obligations to plan for systems that include providing services without investment in physical infrastructure, to name a few.²⁴ Rossi (1998, p. 1239) argues that

... obligations applicable to utilities are extraordinary, often requiring utilities to extend and provide service to customers where it is not always profitable to do so. Extraordinary utility service obligations have fairness and distributive goals. Yet, they also have an intellectual basis in modern economic theory, particularly theories of monopoly regulation. The economic efficiency rationales for the common law obligations vary somewhat across different utility industries.

Epstein (1997, p. 2118) expands on the economic rationale by noting “[t]he obligation of universal service to all comers is the obvious and effective way to overcome the holdout advantage that common carriers would otherwise possess as against their customers.” To paraphrase Epstein, utilities subject to a duty to serve are not given an ordinary property right to exclude, rather, utilities are protected by a liability rule allowing customers to take service on demand in return for fair compensation through a ratemaking exercise.

Service extension obligations, one might argue, are imposed on the utility, rather than assumed by the consumer, because the utility is in a better position to spread the costs of extension among multiple customers, thus minimizing the effect on customers, including those middle- and lower-income customers whose valuation of incremental dollars is relatively high.

²⁴ These planning requirements often fall under the *non-wires* or *non-pipes* alternatives. In some cases gas utilities may include the option for customers to fuel-switch either partially or fully away from natural gas service.

It is this provision of a public service by a public utility with extreme market power that is inextricably linked to the well-being of society.

The enjoyment of the monopoly compels the performance of resultant duties. If a utility would occupy, exclusively, a given territory it must serve adequately, fairly, fully, this same territory. For the very reason that it is the only one in the field, it is under imperative obligation to serve, within reasonable bounds, all whom it finds within its field...[A]n obligation exists upon the part of each utility to fully saturate its territory with service. It cannot select the profitable part and ignore entirely the un-profitable. The desires and needs of those living in the sparsely settled, outlying territory, are just as real and imperative as are those of the more fortunately situated ones living in the compact portions, and in so far as those desires and needs can be reasonably gratified and met it is the duty of the utility to bring about this result. Indeed, it sometimes seems as though the people who live on our farms are entitled to special consideration in the matter of obtaining those things which, a few years ago, were regarded as luxuries, but which today are necessities, -such things as electric light and power, telephones, pure water, passenger, and freight service by steam and electric railroads, postal delivery of mail and merchandise, good roads, rural government credit, bulletin information on agricultural problems. And it is equally certain that, in practice, these things cannot come to our rural residents unless we practically apply the centuries-old doctrine that the strong ought to help the weak, and the strong must necessarily pay more than the weak. This idea is not socialistic, at least not today. (G.B. Churchill v. Winthrop & Wayne Light & Power Company, 1916, p. 211)²⁵

The idea of infrastructure as a road to economic development has a long history in the U.S. John Quincy Adams, in his first *State of the Union* address, declared:

The great object of the institution of civil government is the improvement of the conditions of those who are parties to the social compact, and no government, in what ever form constituted, can accomplish the lawful ends of its institution but in proportion as it improves the condition of those over whom it is established. Roads and canals by multiplying and facilitating the communications and intercourse between distant regions and multitudes of men, are among the most important means of improvement... (J.Q. Adams, *Address to Congress*, 1825)

²⁵ That same year, the Maine Commission ruled that the obligation to serve is “not without limits,” and would not be imposed when either customers or the utility are harmed or in the case where extending service is “physically or financially impossible or unreasonable.” Re: Augusta Water District, by Complaint of Commission on it Own Motion, (1916, p. 187).

This presumed role of government in promoting the general welfare, which also appears in the preamble to the U.S. Constitution, permeated policymaking for many years, especially as it relates to the development and use of basic infrastructure. In his classic study of the history of internal improvements, i.e., basic transportation infrastructure, Goodrich (1960, p. 3) describes the work:

...[the]...study of the role of American governments—federal, state and local—in the creation of the facilities of inland transport...it is an analysis...of development policy, the provision of social overhead capital, and the relations between public promotion and the efforts of private enterprise. In the language of the time, the issue was that of internal improvements. The older phrase carries the connotation which the modern student must not overlook- of a movement that called for the exercise of public spirit as well as the search for immediate gain. To improve the country's natural advantages by developments in transportation was, in the eyes of Washington and many others, a duty incumbent both on governments and on individual citizens.

The promotion of the public good by harnessing private enterprise is nowhere better exemplified than through the notion of *universal service* which sits at the heart of the role of the public service company. This special type of entity, in an otherwise private-sector economic model, stands in the place of the state in providing necessary services to the public.

A railroad is a public highway, and nonetheless so because constructed and maintained through the agency of a corporation deriving its existence and powers from the state. Such corporation was created for public purposes. It performs a function of the state. Its authority to exercise the right of eminent domain and to charge tolls was given primarily for the benefit of the public. (*Smyth v. Ames* 169 U.S. 466, 467, 1898)²⁶

These policies toward the public utility are neatly summarized as follows:

²⁶ Also see *Milheim v. Moffat Tunnel Improvement Dist.* (1923) citing *Olcott v. The Supervisors* (1872), (“Whether the use of a railroad is a public or a private one depends in no measure upon the question who constructed it or who owns it. It has never been considered a matter of any importance that the road was built by the agency of a private corporation. No matter who is the agent, the function performed is that of the state. Though the ownership is private the use is public.”), Justice Bradley’s dissent in *Chicago, Milwaukee & St. Paul RR. Co. v. Minnesota* (1889) (chartered by the state means for the purpose of performing a duty which belongs to the state itself.), Justices Brandies dissenting with whom Justice Holmes concurs, in *State of Missouri ex rel. Southwest Bell Telephone Company v. Public Service Commission of Missouri et. al.* (1923) (“The investor agrees, by embarking capital in a utility, that its charges to the public shall be reasonable. His company is a substitute for the state in the performance of the public service; becoming a public servant.”),

... the doctrine of public interest referred to in the Munn case...[is the]... recognition that the notion of a common necessity for civilized life underlies...[it]...The concept of a public utility thus becomes a legal instrumentality to achieve an improvement of the standard of life. (Glaeser, 1927, p. 179).

The recognition by society that certain services are necessary and require universal, nondiscriminatory provision to promote societal wellbeing is also part of the regulatory compact to which the Massachusetts regulator refers. (Massachusetts D.P.U *supra note 5* p.14). This concept also has a long history:

The ... [capital needed is] beyond the ability of individual enterprise and can only be accomplished through the aid of associated wealth. This will not be risked unless privileges are given and securities furnished in an act of incorporation. The wants of the public are often so imperative that a duty is imposed on the Government to provide for them; and, as experience has proved that a state should not directly attempt to do this, it is necessary to confer on others the faculty of doing what the sovereign power is unwilling to undertake. The legislature, therefore, says to public-spirited citizens: "If you will embark, with your time, money, and skill, in an enterprise which will accommodate the public necessities, we will grant to you, for a limited time period or in perpetuity, privileges that will justify the expenditure of your money, and the employment of your time and skill." Such a grant is a contract, with mutual consideration, and justice and good policy alike require that the protection of the law should be assured to it. (*The Binghamton Bridge Case*, 1865).

The public character of the enterprise was always in play in the minds of many within society who viewed the utility as a public-private partnership:

While the property of this company nominally belongs to its stockholders, subject to mortgages held by its bondholders, the public itself is interested even to a greater extent than either the stockholders or bondholders in continued proper operation and maintenance of such property. In the case of operation, the public is the first to suffer from inadequate service. Inasmuch as proper service can never long be rendered in any line of business enterprise without reasonable compensation, it is incumbent upon the public to pay for the kind of service it desires, and such public cannot justly complain if it does not receive a character of service better than that for which it has paid. (*Re United R. & Electric Co.*, 1919)

The Pennsylvania Public Service Commission connects the concept of public use *and* monopoly with the "contract" the utility has with the public:

The rights, powers and privileges which are conferred upon public service companies are likewise accompanied with duties and obligations. It is a part of the contract with the Commonwealth that they should perform the service undertaken. That service must be regarded with some breadth of view. The undertaking is to perform the service as a whole. The public service company cannot be permitted, holding a monopoly as it often does, to select the most profitable parts of the service, and supplying them, treat such performance as a compliance with its duty. While that which is unreasonable will not be required of it, and care will always be taken to see that unnecessary impositions upon it are not permitted, it may be stated as a general proposition, that a corporation which undertakes to light a Borough must be ready to furnish reasonable lighting to all parts of the Borough. (John O. Ulrich v. Eastern Pennsylvania Light, Heat, and Power Co., 1915, p. 131)

The notion that society has entered a bargain with a private entity to perform the duties of the state defines the public service company as those entities are known today.²⁷ That bargain, as any bargain, contains *consideration*, that is, payment. This report turns next to the financing of the obligations.

2.2. Financing The Obligation

As noted above, there is a strong history in the regulation of these special common carriers, now called public utilities, of recognizing that obligations require compensation.

The Court...upheld a large number of state regulatory measures...exceptions were those which controlled public utility rates, and these decisions can be “rationalized” on the ground that the Court was less interested in rate regulation per se than in assuring that regulated utilities would continue to attract the investment capital necessary for expanding and improving services to the public. (Porter, 1976, p. 143)

While fidelity to the *Takings Clause* of the Fifth Amendment surely influenced these decisions, however, at the same time, the Court showed a strong interest in assuring that investments were prudent and served the public interest. (Id. p. 150). One could, as Porter (Id. p. 155) does, claim that the Court, in establishing “a national standard for public utilities

²⁷ Whether the *bargain* is a commercial contract requiring remedies for breach is beyond the scope of this report and remains controversial.

regulation” also promoted economic development by creating “minimal assurances for necessary capital investment as well as guidelines for consumer protection against unwarranted charges.”

This does not mean that utilities must extend service to all areas. It does, however, mean that provision of service is generally assumed within the service territory.

Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which it is presently profitable for them to serve and restricting the development of the remaining portions by leaving their inhabitants in discomfort without the service which they alone can render. (*New York & Queens Gas Co. v. McCall*, 1917).

What does the compensation for this obligation entail? Does each customer or customer group need to compensate a utility fully for services rendered? Does the utility merely need to earn an overall return that compensates? Is that return based on *ex ante* or *ex post* concepts? What does *return* mean? These are all issues regulators, and ultimately courts, weighed in on. Rates, and by implication net income and return, of a company, must be *just and reasonable*. The inquiry begins with whether the rates are confiscatory.

Rates which are not sufficient to yield a reasonable return on the value of the property used at the time it is being used to render the service are unjust, unreasonable, and confiscatory, and their enforcement deprives the public utility company of its property in violation of the Fourteenth Amendment. (*Bluefield Water Works v. Public Service Comm'n*, 1923).²⁸

While the principle of a violation of confiscatory rates is the test for a reasonable return, the question remains as to how to calculate the return. Since the return has two aspects, net income and the value of the property, how should the regulator set these values? This issue is addressed by the *End Results Doctrine* articulated as:

...not the theory but the impact of the rate order...If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry...is at an end. The fact that the

²⁸ The *Bluefield* Court notes: “[T]his is so well settled by numerous decisions of this Court that citation of the cases is scarcely necessary,” then cites *Smyth v. Ames* (1898) (“What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience.”)

method employed to reach that result may contain infirmities is not then important.
(*Federal Power Commission v. Hope Natural Gas Co.*, 1944)

The *Hope* Court continues reciting precedent that, while no utility is guaranteed a return, “the investor has a legitimate concern with the financial integrity of the company” and rates that recover “not only...operating expenses, but also...the capital costs...” The Court reiterated that returns “should be commensurate with returns on investments in other enterprises having corresponding risks...” and “be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.” (Id. p. 603). The focus then is the *overall* return via the net income, and property value, the utility employs. How the regulatory body develops net income and measures the property value is unimportant *unless* the result of the approach leads to unreasonable outcomes.

Utilities, however, do not have the right to request increases in rates because some individual, or even subset, of costs changed.²⁹ It is the overall cost level compared to the overall revenue level which sets the net income that must meet the standard set out above. In financing the obligation neither do customers have an absolute right to extension of service lines.

The expense of making water extensions demanded of a water company by inhabitants of a municipality is not the controlling feature in determining the reasonableness of the demand therefore, because water rates, as a whole, must be sufficient to allow a fair, just, and reasonable income on the property of the company devoted to public use which would include such necessary expenditures; but an additional expenditure by the company, or an additional burden on the rate payers as a whole, should not be imposed for the benefit of a particular portion of the community unless a reasonable necessity for it exists. (*Lukrawka et al. v. Spring Valley Water Company*, 1915, pp. 331-348.)

Enabling the public utility to access adequate financial resources is the key to the universal service policy but regulators do not simply apply a generic rule when reviewing

²⁹ This is called the prohibition on single issue ratemaking. See e.g., *Citizens Utility Board v. Illinois Commerce Commission* (1995); *Business and Professional People for the Public Interest v. Illinois Commerce Commission* (1991); *State ex rel. Utility Consumers Council of Missouri, Inc. v. Public Service Commission of Missouri* (1979); or *Pennsylvania Indus. Energy Coalition v. Pennsylvania Pub. Util. Comm’n* (1995). There are limited exceptions to the single-issue ratemaking prohibition related to items that are highly volatile.

extension of service. A balance is struck between the goal of universal service and the ability to finance that universal service such that the utility is offered a fair opportunity to earn while not overburdening the entire customer base. The report next examines the administrative process to see how policy components have been implemented over time to achieve these public policy goals while striking the right balance.

2.3. Administrative Framework to Support Universal Service

To achieve and maintain the policy goal of universal service, a process was created to identify the reasonable cost of supplying service and apply policies that support universal service. In this section, the report first reviews the general ratemaking process—cost of service regulation—then turns to the four major components of universal service:

1. *Extension of service*: policies for hooking new customers to the system.
2. *Earnings Test*: The requirement that the utility be provided a reasonable expectation that it will recover, over the long term, its costs of providing service if it operates in an efficient manner.
3. *Service Abandonment*: policies and requirements for discontinuing service.
4. *Rate Design*: the setting of rates and conditions of service for all customers.

2.3.1. Cost of Service Regulation

The ratemaking process, which is called cost-of-service regulation (COSR), embodies over one-hundred-years of practical application through regulatory policies overseen by the judicial process.³⁰ Since the regulatory equation noted above is a mechanical metric, regulators and courts have developed principles applied to each category of cost in the equation. The

³⁰ A full exploration of the COSR method and the regulatory and legal process by which it evolved is beyond the scope of this report. McDermott (2012) provides a more complete review of COSR as it has been applied in the United States. Several other resources present the basic structure of regulation. *See e.g.*, Bonbright (1962), Garfield and Lovejoy (1964), and Phillips (1965). Earlier texts include Jones and Bigham (1931) and Troxel (1947).

prudence standard is applied to capital spending and all capital must be *used and useful*. Prudence is generally defined in terms of the *reasonable person standard*. That is, given the information known, or that should have been known, at the time a decision is made, if that decision could have been made by a reasonable person, then that decision is prudent (i.e., prudence is not a 20/20 hindsight review). Imprudent management can lead to the exclusion of the costs associated with those actions, though substitution of the regulator's judgment for management judgment is not allowed. (See e.g., Allison, 1985).³¹ Used and useful requires that utility assets are sized at any given time such that such assets will, or are expected to, provide service to customers. (See e.g., Hoecker, 1997 or Lesser, 2002).

Expenses must meet a standard of reasonableness and are normalized to remove any unusual, e.g., nonrecurring or extraordinary, expenses. Regulators generally seek to match expenses with the time over which the rates are set though can approve recovery of other expenses, even those expenses that do not directly match the period under evaluation, if those expenses were incurred to meet public policy goals or regulatory and legal requirements (e.g., energy efficiency spending, environmental cleanup costs). Regulators can also disallow expenses deemed to benefit only shareholders or are otherwise disallowed by public policy (e.g., political lobbying or advertising expense).

The revenue requirement is typically developed for a 12-month period called a *test year*. Traditionally, the test year was based on a historic period, or *historic test year*, with only *known and measurable adjustments* allowed to the historic data. Since the 1970s some jurisdictions have moved toward a *future test year* which attempts to estimate the costs expected in a future 12-month period. (See e.g., Downs, 1972; Costello, 2013b). Various combinations of future and historic test years have also been used.

Finally, the utility is offered an *opportunity* to earn a fair rate of return to obtain capital, typically from equity and debt, which should allow for the capital necessary to expand service to

³¹ Also see *Business & Professional People for the Public Interest v. Illinois Commerce Commission* (1988), *Business & Professional People for the Public Interest v. Illinois Commerce Commission* (1996).

all customers within its service territory.³² This return, however, is an *overall* return applied to the capital or *rate base* allowed by the regulator. Utilities generally do not have to show that each customer provides the same return, though often a return at the rate class level is used for rate setting purposes. This is an important distinction since most utilities charge postage stamp rates, at least for interconnected divisions, and often for the entire service territory. It is at once obvious that not all customers cause the same cost on the system. While cost of service studies try to differentiate between major differences in costs, for example, between costs to service large industrial customers and residential customers, these studies are typically highly aggregated for the very purpose of setting postage stamp rates. By design, this approach examines the total cost of the utility to serve all customers, and the utility’s ability to earn its allowed rate of return, even if the rates assigned to certain customer classes do not fully recover the total cost of service.

2.3.2. Extension of Service

Service extensions or line extensions typically refer to a utility extending a main along a right-of-way to a point adjacent to the customer’s premise.³³ Service extension follows directly from the obligation to serve. Early summaries of the policy toward line extension note that utilities are expected to extend service to “meet the wants...of a growing community,” and “should, if practicable, extend its lines to all parts of its franchise territory for the purpose of

³² The *opportunity* to earn a fair return is contrasted with a *guaranteed* return. Utilities are not guaranteed a fair return. The fair return is set prospectively based on estimated operations and capital costs; the actual return will fluctuate based on the ability of the utility to control its costs. Utilities, in general, may not request higher rates to compensate for lower than expected returns in past years.

³³ For purposes here the report focuses on extension of mains, though this discussion applies to service line, i.e., the line from the main to the customer’s meter, extensions as well. Extension of a utility’s service territory, for example to serve new areas that were previously sparsely or uninhabited or otherwise underserved, may require additional regulatory oversight through modification of a utility’s certificate of public convenience and necessity (CPCN). A CPCN process typically evaluates the need for the service and the ability—financial, technical, and managerial—of the utility to provide the service. The legislation governing CPCN extensions can address specific deficiencies in universal service, such as areas that are generally underserved or have imperfect substitutes for utility services. *See e.g., Pembroke Environmental Justice Coalition v. Illinois Commerce Comm’n* (2023) (judicial review of approved CPCN for extension of service to Pembroke township Illinois under Illinois statute designed to provide “a mechanism by which a gas public utility may extend its service territory and gas distribution system to provide service to designated low-income areas whose residents do not have access to natural gas service and must purchase more costly alternatives to satisfy their energy needs.”)

supplying consumers.” Though “the duty...is not absolute...but depends upon the sufficiency of the demand...” and “reasonableness of...demand...must be considered as well as the necessity of the service since existing consumers must be considered as well as the interests of the utility.”³⁴

In general, the *reasonableness* of demand is a case-specific determination considering the likelihood of future demand and the effect on both the utility and its existing customers. Traditionally, this meant that utilities must extend service if the service extension is effectively paid for by the existing rates. While the calculation of how much *line extension* is paid for by existing rates varies, conceptually, if the incremental cost to hook up a new customer is less than the expected revenue from the new customer, then the new customer is paying for the extension and is in a comparable situation as existing customers. (See 2.3.5 for a discussion of discrimination in rate design). If the cost of extending the line exceeds the expected revenue, or the expectation of that revenue is in doubt, utilities may have the option to determine whether the extension should occur or how much the customer must contribute to funding the extension such that other customers are not providing a cross-subsidy to these new customers.³⁵ This is consistent with the traditional approach to line extensions that imposes the obligation to serve on the utility except in cases where the extension is infeasible or economically unreasonable.

2.3.3. Earnings Test

The earnings test, as noted above, is generally an overall earnings test. That does not necessarily mean that extension of service must contribute the *same* level of earnings as the overall return. For example, the Missouri Public Service Commission ruled that while it had the

³⁴ The summary of then-existing policy is found in Nichols (1928, pp. 261-270).

³⁵ The term *subsidy* and *cross-subsidy* have been used and mis-used since the early days of railroad rate regulation. A subsidy is an *external* payment made to a producer to produce something that is otherwise unprofitable (e.g., subsidies for electric vehicles or renewable power). A cross-subsidy is an *internal* payment from one service to another which is the issue that generally comes up in the context of utility regulation. This is the old question of whether one group pays *too much* while another pays *too little*.

authority to modify line extension rules and it would even consider relieving customers of the obligation to pay for the full line extension when demand growth was likely to provide the utility with future revenue, it none-the-less was unwilling to require a service extension, without payment, even in the case where the physical distance was relatively close, if some other factor would require an excessive cost to the extension. (*L.E. Lortz v. Union Electric Light & Power Company*, 1918, pp. 223-232.) Yet, line extensions need not be profitable in and of themselves if the financial condition of the utility is considered. (*In Re: Water, Gas, Electric and Telephone Utilities Requiring Deposits*, 1915, p. 755).³⁶ Profitability is also up for consideration. For example, Maine required a utility to extend service if the customer guaranteed a payment sufficient to pay for the historic return on investment plus a provision for depreciation. (*G.B. Churchill v. Winthrop & Wayne Light & Power Company*, 1916, pp. 218-219). As these cases show, public policy emphasized universal service, and its concomitant effect on the economic development of a jurisdiction, if the financial effect on the utility did not hamper its ability to continue to provide service to other customers and attract capital. In other words, the earnings test informed the regulator of the current financial conditions of the utility in making an assessment of the ability of the utility to support further service expansion. In the next section, the report discusses the application of the earnings test in the context of the request to abandon service and finds that the same *overall return* approach is taken in the case of abandonment.

2.3.4. Abandonment of Service

Since the policy goal is universal service, regulators are reticent to allow utilities to abandon service, especially if the utility is earning its overall fair return.

³⁶ The California Commission noted “The Commission has frequently drawn attention to the fact that it is unreasonable for utilities to urge that each extension constructed at their cost must be profitable in itself. Such a policy would lead to grave results in thwarting the development of this state, and cannot be permitted by this Commission.” Though the Commission also recognized that service extensions are subject to regard of the utility’s financial condition and the rights of existing customers. (*Id.*) We interpret this ruling to fall within the context of the *overall return* criteria or what we have termed the *earnings test*.

It is a general policy...to require a public service company to continue a portion of its service even when that portion is operated at a loss, where public necessity for such continuance exists, and the loss sustained from the operation will not jeopardize or place an undue burden upon the general service rendered by the public service company. (*Public Service Comm'n v. Delaware & Hudson R.R.*, 1936).

In the case of abandonment, only if there is no obligation to serve can the utility abandon a service if the utility is provided a reasonable to earn a fair return. (*Columbus Ry. Power & Light Co.*, 1918). Similarly, Federal regulators have these conditions imposed by law as in the case of natural gas.

No natural-gas company shall abandon all or any portion of its facilities subject to the jurisdiction of the Commission, or any service rendered by means of such facilities, without the permission and approval of the Commission first had and obtained, after due hearing, and a finding by the Commission that the available supply of natural gas is depleted to the extent that the continuance of service is unwarranted, or that the present or future public convenience or necessity permit such abandonment. (Natural Gas Act, 15 U.S.C. § 717f(b))

Regulators have treated service provision, whether in the context of the extension of service or the abandonment of service, in the same way. The obligation to serve, and to serve in as universal a fashion as practically possible, is paramount to the public utility concept.

The report next turns to the issue of undue discrimination.

2.3.5. Rate Design, Service Conditions, and Undue Discrimination

When reviewing a utility rate book, the most obvious characteristic is the variety of rates. Even small utilities typically have at least three different rate schedules for service and most have many more. Economists use the term *price discrimination* to refer to the practice of selling the same good to different customers at different prices. (Varian, 1989, p. 598). Charging different prices for different services has a long history in the regulation of public utilities since

the industries tend to meet the pre-conditions for price discrimination.³⁷ Yet, typically, one of the most oft-cited obligations of utilities is to provide service at rates that are not unduly discriminatory based, at least in part, on the ancient idea that common carriers are public agents:

...a person having a public duty to discharge, is undoubtedly bound to exercise such office for the equal benefit of all, and therefore to permit the common carrier to charge various prices, according to the person with whom he deals, for the same services, is to forget that he owes a duty to the community. (*Messenger v. Pennsylvania R.R. Co.*, 1874)

The Court also notes that the compact between the utility and the state is an exchange of grants of privilege from the government to the public utility. A grant which the government is not compelled to provide. If the government retained the obligation to provide utility service itself, which, of course, some governments do, it could not “favor one citizen over another.” The court then concluded that “in the use of...[public utility franchises]...all citizens have an equal interest and equal rights, and all must, under the same circumstances, be treated alike.” (Id. p. 413)

Indeed, most utility statutes contain some form of a prohibition on unreasonable, undue, or unjust discrimination in the provision of service. Henderson and Burns (1989, p. 30, citing *Corpus Juris Secundum*) summarize the legal issue:

A public utility is obligated...to furnish its service to the general public...without arbitrary discrimination. It must, to the extent of its capacity, serve all who apply, on equal terms and without distinction as far as they are in the same class and similarly situated, since a reasonable classification is permissible, provided all those similarly circumstanced are treated alike Public utilities are prohibited . from maintaining unreasonable difference among various classes of service . [A public utility] cannot arbitrarily refuse to one a favor or privilege which it has extended to another...

Courts, from an early time, however, ruled that rates need not “be uniform or...[return]...the same percentage of profits on every sort of business.”³⁸ Yet, what constitutes

³⁷ Economists have identified three basic conditions that allow for differential pricing (1) the firm must face a downward sloping demand curve; (2) the firm can easily identify customers; and (3) customers cannot resell. (Varian, 1989, p. 599)

³⁸ *Norther Pacific RY. Co. v. North Dakota* (1915).

arbitrary discrimination was open to debate. One such case is found in 1913 when a review of rates for an electric utility determined that special rates for various entities, including “drugstores that distribute advertising” and discounts to company employees, were unjustly discriminatory since these prices had no relationship to the cost of providing the service. (Palmer and Traeger, 1913, p. 92). Bonbright (1962, pp. 372-381) suggests that embedded or fully distributed cost is not the only standard used by regulators to judge discrimination. Value of service as well as varying cost standards (e.g., marginal cost) have also been used to justify different treatment of customers. Special rate discounts have long been allowed for customers who are in all other ways similar, if competition for that customer is sufficiently strong.³⁹ Referring to the Federal Energy Regulatory Commission (FERC) interpretation of “unjust, unreasonable, unduly discriminatory,” (McGuire, 2012 p. 562) suggests that FERC determined whether “factual differences” justify treating “similarly situated” customers differently. FERC was not solely referring to pricing, terms and conditions of service are also included, though that non-rate discrimination, is unlawful “seems never to have been doubted.” (Burdick 1911a, p. 531)

Since the overriding policy goal is to promote universal service, undue discrimination is likely to thwart that goal if similar customers are treated differently. While generally not all rates are uniform, rates for similar customers are often uniform to all customers on the system. When all customers, no matter where they physically connect to the system, are charged the same price as all other similarly situated customers, that approach is called a *postage stamp* pricing method in reference to the method used by the US Postal Service since 1863.⁴⁰

For line extensions, whether new and existing customers are treated differentially typically comes down to a factual question of whether it is *reasonable* to extend service given the costs and the demand for the service. The question of whether a customer hooking up to the system is *paying their fair share* is, in theory, easy to address. The basic question of subsidy

³⁹ For gas local distribution companies, this often results from customers located near other gas facilities such as an unaffiliated interstate pipeline to which a customer could cost effectively access.

⁴⁰ Prior to 1863 some version of distance-based pricing was employed.

comes down to the question of whether a service is paying for its incremental cost and whether other services are paying more than their *standalone costs*. (Faulhaber, 1975). Suppose the utility is providing two services: Existing Service (S_1), and New Service (S_2). The total cost for providing these services together is $C(S_1, S_2)$. The standalone costs for Service 1 are $C(S_1, 0)$ and the standalone costs for Service 2 are $C(0, S_2)$. The incremental cost for Service 2 is $IC(S_2) = C(S_1, S_2) - C(S_1, 0)$. If we look solely at the incremental cost, we might suggest that a subsidy does not exist if the payment for Service 2 is equal to the Service 2 incremental cost. Suppose $C(S_1, S_2) = \$150$, $C(S_1, 0) = \$75 = C(0, S_2)$ and $IC(S_2) = \$75$, if each is charged \$75 then the standalone costs of each of both services are covered and the incremental cost is covered implying no subsidy. If, however, $IC(S_2) = \$100$ and $C(S_1, S_2) = \$175$ then S_2 must be charged, at least, \$100 since charging something less, say \$75, would require charging S_1 \$100 which exceeds its standalone costs. Since S_1 is paying more than its standalone costs a cross-subsidy exists following from S_1 to S_2 . In this case, the standalone cost test and the incremental cost test are equivalent.

The report next turns to the line extension policies in place currently in the US.

3. Natural Gas Line Extension Policies at the US State Level

3.1. Historical Context

As outlined in previous sections, the notion of universal service sits at the heart of the role of public service companies, and the obligation to serve and provide adequate service entails a duty to extend service if requested. As such, line extension policies provide a consistent set of rules and guidelines for evaluating the extension of service to new customers and determining how the projects are funded.

While line extension policies vary among gas utilities, traditionally, the guiding principle is to ensure that extending service to new customers benefits existing customers through spreading fixed costs among a larger customer base. Line extension policies were designed to

ensure that this beneficial cost-spreading effect occurs without cross-subsidies from existing customers to new customers, while allowing the utility to provide a level of investment commensurate with the incremental revenues from the new customers. Those wishing to change these policies typically claim that any cost of a main extension not directly paid by new customers is a cross-subsidy from existing customers to new customers. (*See e.g.*, Dammel, 2022, p. 7). While not always clearly delineated, presumably that would only apply if the rates paid by new customers are not compensatory and increase the overall revenue requirement.⁴¹

A line extension process begins when a potential new customer requests service. It is common for a utility to perform an economic assessment that compares the expected future revenues of the new customer to the construction cost to connect that customer over some time frame. Expected future revenues are calculated based on applicable tariff rates and an estimate of the potential customer's consumption, which often considers variables such as dwelling size and types of gas-powered appliances (e.g., space heating, water heating, cooking). Expected construction costs include service line, meter, and if applicable, main extension costs.

The following section will examine the pricing applications of such financial assessments in more detail.

3.2. Pricing Applications

Despite the wide range of approaches, the basic idea behind an economic assessment is to calculate whether the revenues from extending service to a new customer would exceed or fall

⁴¹ The label "subsidy" seems a function of the terminology "free service." Whether there is a true economic subsidy is an empirical question, however, our understanding of ratemaking, and the postage stamp approach to pricing, suggests that roughly half of existing customers are also subsidized since the replacement cost of ordinary maintenance on mains servicing existing customers is rolled into the average rate. Those existing customers who are less than the average number of feet from the nearest main, under this theory, are cross-subsidizing those who are farther than the average number of feet from the nearest main. While using the term "subsidy," the CPUC makes a distinction between "decreasing cost industries" and "increasing cost industries" implying that "free line extensions" may have made sense when the increased number of customers reduced utility costs but that may not have been the case after the 1970s. (CPUC Decision 22-09-026, pp. 8-9). While monopolies have no supply curve in the traditional sense, whether inputs to gas utilities are sufficiently constrained to cause the average cost curve to increase as more output (i.e., number of customers) increases is an empirical question beyond the scope of this report.

below the costs of serving that customer.⁴² On a net present value (NPV) basis, if expected future revenues of a new customer equal or exceed the expected construction costs to connect that customer including the authorized rate of return, it is common for a utility to grant a line extension allowance (LEA) that either offsets the required incremental investment in its entirety or provides an amount such that an NPV value of zero is achieved. If expected construction costs exceed expected revenues, then the customer must make a financial contribution to make the extension financially feasible and to prevent existing customers from subsidizing new customers. Presumably, new customers are only willing to pay the additional cost if the added benefits from gas service exceed the cost to hook up to the utility system. If the NPV is greater than or equal to zero, then no cross-subsidy can occur because no class of customers either underpays or overpays its standalone cost of service.

The NPV approach described above is either used explicitly to calculate the level of allowance for each customer or performed at a system level to support more simplistic approaches. Generally, there are three such approaches:

- **Revenue/Margin Multiplier:** Instead of performing an NPV study for each new customer, a utility may choose to provide an allowance that equals a multiple of annual expected non-fuel base distribution margin revenues. Under this approach, the customer's revenue stream is estimated based on customer class usage characteristics or the specific appliances fueled by natural gas.
- **Footage Allowance:** Conceptually, there is some cost for mains hooking up customers embedded in existing rates. A footage allowance estimates the value of the basic level of service which operates as an offset to construction costs based on the distance from the distribution main. If the customer is located farther from the distribution main than the distance covered by the footage allowance, the customer must pay the additional cost of construction.
- **Dollar Allowance:** A dollar allowance follows a similar approach without the use of distance as a factor. The construction allowance is capped at a fixed dollar amount, and the customer must pay the costs that are above the fixed cap.

⁴² Line extension policy has been debated since the early years of utility service. For example, Duffy (1927) makes an argument that appears like the approach most utilities now take: some value of line is embedded in rates, new customers must compensate the utility for any cost of the extension that exceeds this value.

Regarding the excess portion of the line extension that must be funded by the customer, some jurisdictions and utilities may require the customer to pay an upfront Contribution In Aid of Construction (CIAC), while others may allow payments over time, for example, through a monthly surcharge applied to the customer bill. The CIAC may or may not be refundable depending on whether there are additional customers who connect and take service from the original extension. In this regard, existing customers are held harmless from the costs to extend service to new customers because there is a reasonable guarantee that the utility will recover such costs through future revenues and financial contributions by the customer if necessary. If there is no *reasonable expectation* that a utility will recover costs, for example, the business is temporary, or the demand is doubtful, then utilities are generally allowed to deny extension of service or require a deposit for that part of the revenue that is considered unlikely to occur.⁴³

Table 1 provides a summary of the approaches used by natural gas utilities found in the research undertaken for this paper. Each of these approaches relies on certain assumptions or inputs into the evaluation of a line extension which the report termed “Policy Levers” indicating that making changes to these inputs or assumptions will necessarily affect the price a customer pays for the extension. For example, in the NPV method, one choice in the analysis is the time over which the customer is expected to pay for the extension through existing rates. Reducing the number of years allowed will necessarily reduce the revenue expected from the customers and increase the upfront cost to the customer.

⁴³ While this statement is made in the context of our survey of natural gas utilities’ line extension policies, we understand this to apply to water and electric utilities as well.

Table 1: Line Extension Approaches and Policy Levers for Natural Gas Utilities

	Approach	Policy Levers
<u>Allowance Portion</u>	<u>NPV Method</u> The utility determines the level of allowable investment based on expected revenues and costs of the extension.	1. Authorized Rate of Return (Interest Rate) 2. Expected time of recovery 3. Expected revenue (or consumption)
	<u>Footage Allowance</u> The utility pays for material and installation costs for a specified length (e.g., 100 feet) of main and service lines.	Distance from main
	<u>Dollar Allowance</u> The utility provides an allowance that is capped at a fixed dollar amount.	Dollar amount
	<u>Revenue / Margin Multiplier</u> The utility determines the maximum allowed investment of the line extension by multiplying the expected revenue by a certain number of years.	1. Multiplier value 2. Expected revenue (or consumption)
<u>Excess Portion</u>	<u>Contribution In Aid of Construction</u> The customer pays for the estimated cost of the extension in excess of the free limit.	Elimination or phase out of allowances
	<u>Surcharge</u> The customer pays a surcharge for the portion of the main line that exceeds what the utility is required to install without charge.	Payment period (e.g., 10 years, 20 years)

3.3. Survey of Natural Gas Utility Line Extension Policies

Although some states have regulations or legislation that explicitly direct utilities to structure line extension policies in a certain way, most states have no statewide policy and leave it up to the utilities to create their own extension policies. Table 2 shows which states have uniform policies to line extensions, and Table 3 shows which states have non-uniform policies.

Table 2: States with Statewide Line Extension Policies

	State	Policy
<u>Allowance</u> <u>Portion</u>	Arizona	NPV Method
	Illinois, Kentucky, New York, Oklahoma	Footage Allowance
	Florida, Iowa	Revenue / Margin Multiplier
<u>Excess</u> <u>Portion</u>	Arizona, California, Florida, Illinois, Iowa, Kentucky, Oklahoma	Contribution In Aid of Construction
	New York	Surcharge

Some jurisdictions, e.g., Indiana and Minnesota, have statewide network expansion policies that are aimed at serving rural customers, low-income customers, previously unserved or inadequately served customers, or customers for whom extending service would yield a negative rate of return. These policies often allow utilities to seek approval from the commission to add certain types of riders or surcharges on monthly customer bills that would allow the utility to recoup the costs of extending service to such new groups of customers. Although network expansion policies are concerned with extending service to new customers, the focus is typically on growth rather than applying a consistent set of rules and guidelines on how to think about incremental additions to the existing network.

Table 3: States with Non-uniform Line Extension Policies

	Approach	States
<u>Allowance</u> <u>Portion</u>	NPV Method	Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, North Carolina, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, Wyoming
	Footage Allowance	Arkansas, Georgia, Indiana, Kansas, Louisiana, Mississippi, Missouri, New Hampshire, North Carolina, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Wisconsin
	Dollar Allowance	Colorado, Kansas, Maine, Montana, Oregon, Washington, Wyoming
	Revenue/Margin Multiplier	Alaska, Hawaii, Idaho, Indiana, Louisiana, Maine, Missouri, Nevada, New Jersey, New Mexico, North Dakota, Oregon, South Dakota, Wisconsin
<u>Excess</u> <u>Portion</u>	CIAC	All states except New York
	Surcharge	Arizona, Arkansas, Connecticut, Delaware, Florida, Idaho, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New York, Utah

More recently, some states have been challenging the idea that natural gas utilities should keep growing to serve new customers. Instead of going through the traditional process of determining the level of allowance and customer contribution for a line extension, states like California and Colorado have started to eliminate line extension allowances completely such that each new customer pays the entire cost of the extension. The California Public Utility Commission (CPUC) eliminated the provision of line extension allowances except in limited

circumstances.⁴⁴ Colorado, Oregon, and Washington have similar orders that direct gas utilities to phase out line extension allowances by a specified date (such as 2025).⁴⁵ Similarly, Massachusetts intends to address line extension tariffs in a more generic docket addressing the *Future of Gas* as does Illinois and Minnesota.⁴⁶

3.4. Summary of Findings

While most jurisdictions have, to date, not applied policy levers to line extension policies, line extension policies have become an issue for the *Future of Gas* proceedings currently pending or expected to begin in 2024. Those jurisdictions that have addressed line extension policies, at least before the public utility commission, have declined to ban gas extensions but have used some or all of the policy levers identified earlier in this report to either require new customers to face the full incremental cost of the decision to hook up to the system or move the price closer to the full incremental cost. The question of the obligation to serve and its close

⁴⁴ See CPUC Order (September 20, 2022), p. 80-81. (“All allowances set forth [by] utilities... shall be removed effective July 1, 2023.” ..”), (“The Commission should allow limited exceptions to the elimination of gas line subsidies by permitting a utility to file an application for projects that meet specific... the following criteria... These minimum requirements are: (1: (a) The project will lead to show a demonstrable reduction in GHG emissions; (2) b) The project’s gas line extension required for the project is consistent with California’s climate goals, including those articulated in SB 32 (Pavley, 2016); and (3c) The project applicant demonstrates that it has no feasible alternatives to the use of natural gas, including electrification.”)

⁴⁵ See Code of Colorado Regulations (“Line extension policies, procedures, and conditions shall be based on the principle that the connecting customer pays its share of the estimated full incremental cost of growth, including any costs associated with increases in design peak demand.”); Order in NW Natural Rate Case, p. 48. (“[The Commission finds] that the record in this case establishes that NW Natural’s LEA should be revised downward.”); Order in Avista Rate Case, Oregon, p. 11 of Appendix B. (“The Parties agree that Avista’s line extension allowance for connecting new customers would be... \$0 in 2027.”); Order in Avista Rate Case, Washington, p. 31. (“...the Settlement establishes a timeline to phase out the Natural Gas Line Extension Allowance by January 1, 2025.”); Order in Puget Sound Energy Rate Case, p. 84. (“The Revenue Requirement Settlement therefore requires PSE to submit tariff revisions... by January 1, 2025, reducing the gas line extension margin allowance to zero.”)

⁴⁶ See Massachusetts D.P.U. *supra* note 5; Order in Nicor Rate Case, p. 232-234 (“...the broader question of eliminating all line extension allowances requires additional information and should be considered in the “Future of Gas”...proceeding” [Illinois “Future of Gas” Docket No. 24-0158]); Order in Xcel Rate Case-c, p. 6. (“[The] Company agreed to reduce its free footage allowance for main line extensions from 100 feet to 80 feet, while maintaining the 75-foot allowance for new service extensions. The Parties further agreed to recommend the Commission explore main and service line extension policies in Docket No. G999/CI-21-565 [Future of Gas Docket].”); New York is in a slightly different situation with utilities instituting moratoriums on some new firm gas offerings. See Case 20-G-131.

cousin universal service, remains open since traditionally, as noted above, public policy erred on the side of expansion of facilities to customers who value those services.

4. Conclusion

Public utilities have long been under the obligation to serve customers, including those requesting service, with exceptions only for unreasonable requests. This policy was a result of the determination that gas utilities served the public and that service was necessary to further the public interest. More recently, climate change concerns have sparked an interest in limiting the public's access to new natural gas services in favor of substitute fuels, namely electricity. Most jurisdictions have yet to change traditional obligations to serve and the line extension policies associated with that obligation, though, as documented above, a few jurisdictions have either made decisions concerning line extension policies or are addressing those policies in formal proceedings.

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Glossary

Term	Definition
Abandonment	The process of decommissioning and removing a gas line that is no longer in use. Typically, this requires PUC approval.
Base Rates	Base rates are set through the formal rate setting process. Generally, base rates recover allowed expenses and return on capital investment. Base rates do not include costs subject to recovery through other mechanisms (e.g., cost of gas commodity).
Certificate of public convenience and necessity (CPCN)	A permit granted to a utility allowing the utility to construct facilities to serve a new geographical location or operate a facility that is outside the currently certificated scope of business. Utilities are generally prohibited from starting construction of such facilities without first obtaining a CPCN from a PUC or other competent agency.
Contribution In Aid of Construction (CIAC)	A payment made by a new customer for the portion of the line extension that is not covered by an allowance. CIAC is not included in the gas utility's rate base but is treated as revenue by the IRS for tax purposes.
Cost of Service Regulation (COSR)	COSR refers to a method of setting the allowed overall revenue for a utility during a test year and apportion those costs to various customer classes for the purpose setting of prices. COSR uses a utility specific cost standard, discovered through the regulatory process, to set the allowed revenue. This differs from other methods of setting allowed revenue that utilize external factors (such as indexes or statistical methods) of setting allowed revenues.
Cost of service study	A study that determines the cost of providing gas service to different customer classes.
Cross-Subsidy	An internal payment from one rate class or customer to another, resulting in one group of customers underpaying and another group overpaying.
Customer Charge	A charge applied on a per customer (or per meter) basis, regardless of usage. Typically charged as monthly \$/customer (or \$/meter).

Demand Charge	A charge based on a measure of the customer's maximum daily usage. Typically, this is charged as \$/Therm of Maximum Demand.
Federal Energy Regulatory Agency (FERC)	An independent federal agency within the US Department of Energy that regulates interstate natural gas pipelines and wholesale electricity markets.
Incremental Pricing	A method of setting rates where the customer directly pays for the incremental cost of extending the line to their property, usually through a one-time connection fee or payments made time.
Internal Rate of Return (IRR)	A calculation of the discount rate at which the present value of future cash flows from a project equals the initial investment. It is used to measure a project's expected profitability.
Known and Measurable (K&M) Adjustments	Adjustments to revenue requirements outside the test year. K&M adjustments must be verifiable, recorded, and identifiable (e.g., a signed contract). Knowledge of a future change is generally not considered known and measurable.
Line Extension	The expansion of gas utility service to new natural gas customers where the utility must install additional facilities to connect a customer.
Line Extension Allowance (LEA)	Payments (or credits) provided by gas utilities to cover all or some of the costs to connect new customers to the gas system. The allowance goes into the utility's rate base and funded through base rates.
Net Present Value (NPV)	A calculation of the present-day value of future cash flows from a project using a discount rate (i.e., an interest rate, or the cost of capital). The NPV is either negative, zero, or positive indicating that the project does not recover, just recovers, or recovers more than its cost of capital.
Perpetual Net Present Value (PNPV)	A method of calculating the line extension allowance based on the expected NPV of the future revenue expected from new customers. This calculation assumes that a customer will stay connected to the natural gas system in perpetuity.

Postage Stamp Rates	A rate structure that charges all customers in the same rate class the same price anywhere on the system—interconnected or otherwise—regardless of the geographical locational of the customer. This is the accepted approach to rate structures in the majority of North American jurisdictions.
Prudence Standard	A legal principle that requires gas utilities to act reasonably base on appropriately informed judgement when making investment decisions, including line extensions.
Public Utility Commission (PUC)	A state government agency that regulates public utilities within the state, overseeing rates, investments, and service quality.
Rate base	Typically, the net depreciated value of a utility's prudently incurred and used and useful assets in the test year. Rate base may also include additions and subtractions e.g., cash working capital or customer provided funds.
Rate Class	A category of customers with similar usage patterns and characteristics. Generally, customers within the same rate class are charged the same prices.
Rate Structure	The entirety of the base rate elements charged to customers. The typical rate elements are: (1) Customer Charge; and (2) Volumetric Charge; . Other base rates may include a Demand Charge and unbundled charges such as a storage charge.
Return on Investment (ROI)	A measure of the profit generated on an investment, expressed as a percentage. A higher ROI suggests better economic viability of the investment.
Revenue Requirement	The total amount of annual revenue a (gas) utility must have an opportunity to recover to obtain the necessary capital to provide on-going services and pay for reasonable expenses of providing current service.
Right-of-way	The legal right to use land for a specific purpose, such as laying a gas line.

Rolled-in Pricing	A method of setting rates where the utility's costs for a line extension (or portion of the line extension) is incorporated into the overall rate structure and recovered through base rates.
Subsidy	An external payment made to a producer to produce something that is otherwise unprofitable (e.g., subsidies for electric vehicles or renewable power).
Surcharge	A charge that is applied to new customer's monthly bills for a certain number of years to recover the cost of the line extension. This extended timeframe enables customers to avoid upfront payments but may come with contractual commitments to lock in certain levels of gas consumption.
Tariff	Legally, an extension of legislation that documents the rates, terms, and conditions of service.
Test Year	A specific period used to estimate the cost of providing service for a (gas) utility. Test years are historical, future, or a mixture of historical and future.
Therm	A unit of heat equivalent to 100,000 Btu. In the US, natural gas is priced in \$/therm, \$/MMBtu or \$/CCF (or \$/MCF) where MMBtu is 1 million Btu, CCF is one hundred cubic feet and MCF is one thousand cubic feet. The US Energy Information Administration reports that in 2022 the average heat content of natural gas in end-use applications in the US was about 1.038 Btu per cubic foot (1 CCF = 103,800 Btu; 1 MCF = 1.038 MMBtu or 10.38 therms.)
Used and Useful	A legal principle that ensures only the cost of utility infrastructure that is used to provide current service, or reasonably expected to provide future service, to customers is included in rate base.
Volumetric Charge	A charge based on the customer's total monthly usage. Typically this is charged as \$/Therm Usage.
Weighted Average Cost of Capital (WACC)	The average cost of capital a company expects to pay to finance its assets. In utility ratemaking, the rate of return authorized for a utility by the commission is often set equal to the WACC (typically of debt and equity) to ensure sufficient capital attraction.

Appendix 1: Specific Gas Utility Line Extension Practices

The following table provides information from each of the listed utility's tariffs that characterizes how the allowance and excess portions of a new line extension will be treated by that utility. Please note that the tariffs are effective as of the publication date of this report, and are subject to change. The citations for the individual tariffs are not provided in this report, but can be provided upon request.

State	Utility	Allowance Portion	Excess Portion
Alabama	Spire Alabama	NPV Method	CIAC
Alaska	ENSTAR Natural Gas Company	Revenue/Margin Multiplier	CIAC
Arizona	Southwest Gas Corporation	NPV Method	CIAC / Surcharge
	UniSource Energy Services	NPV Method	CIAC / Surcharge
Arkansas	Arkansas Oklahoma Gas	NPV Method	CIAC
	Summit Utilities	NPV Method	CIAC / Surcharge
	Black Hills Energy	Footage Allowance	Surcharge
California	Pacific Gas and Electric Company	No Allowance	CIAC
	Southern California Gas	No Allowance	CIAC
	Southwest Gas Corporation	No Allowance	CIAC
Colorado	Atmos Energy	No Allowance	CIAC
	Black Hills Energy	Dollar Allowance	CIAC
	Public Service Company of Colorado (dba Xcel Energy)	Dollar Allowance	CIAC
Connecticut	Connecticut Natural Gas Company	NPV Method	CIAC
	The Southern Connecticut Gas Company	NPV Method	CIAC
Delaware	Chesapeake Utilities	NPV Method	CIAC / Surcharge
	Delmarva Power & Light	NPV Method	Surcharge
District of Columbia	Washington Gas Light Company	NPV Method	CIAC

State	Utility	Allowance Portion	Excess Portion
Florida	Florida Public Utilities Company	Revenue/Margin Multiplier	CIAC
	Peoples Gas System	Revenue/Margin Multiplier	Surcharge
	Florida City Gas	Revenue/Margin Multiplier	CIAC
Georgia	Atlanta Gas Light	Footage Allowance	CIAC
Hawaii	Hawai'i Gas	Revenue/Margin Multiplier	CIAC
Idaho	Avista Utilities	Revenue/Margin Multiplier	Surcharge
	Intermountain Gas Company	Revenue/Margin Multiplier	CIAC
Illinois	People's Gas	Footage Allowance	CIAC
	Nicor Gas	Footage Allowance	CIAC
Indiana	Northern Indiana Public Service Company (NIPSCO)	Footage Allowance	CIAC
	Indiana Gas Company (dba CenterPoint Energy Indiana)	Footage Allowance	CIAC
	Indiana Natural Gas Corporation	Revenue/Margin Multiplier	CIAC
	Midwest Natural Gas Corporation	Revenue/Margin Multiplier	CIAC
	Ohio Valley Gas Corporation	Revenue/Margin Multiplier	CIAC
Iowa	Alliant Energy	Revenue/Margin Multiplier	CIAC
	Black Hills Energy	Revenue/Margin Multiplier	CIAC
	Midamerican Energy Company	Revenue/Margin Multiplier	CIAC
Kansas	Black Hills Energy	Footage Allowance	CIAC
	Kansas Gas Service	Footage Allowance	CIAC
	Midwest Energy	Dollar Allowance	CIAC
Kentucky	Columbia Gas of Kentucky	Footage Allowance	CIAC
	Duke Energy Kentucky	Footage Allowance	CIAC
	Atmos Energy Corporation	Footage Allowance	CIAC
	Louisville Gas and Electric Company	Footage Allowance	CIAC

State	Utility	Allowance Portion	Excess Portion
Louisiana	Atmos Energy Corporation	Revenue/Margin Multiplier	CIAC
	CenterPoint Energy	Footage Allowance	CIAC
Maine	Summit Natural Gas	Dollar Allowance	CIAC
	Bangor Natural Gas	Revenue/Margin Multiplier	CIAC
	Northern Utilities (dba Unutil)	NPV Method	CIAC
Maryland	Baltimore Gas and Electric	NPV Method	CIAC
	Washington Gas Light Company	NPV Method	CIAC
Massachusetts	NSTAR (dba Eversource Energy)		CIAC / Surcharge
	New England Natural Gas Company (dba Liberty Utilities)	NPV Method	CIAC
	Fitchburg Gas and Electric (dba Unutil)	NPV Method	CIAC
Michigan	Consumers Energy Company	NPV Method	CIAC / Surcharge
	DTE Gas Company	NPV Method	CIAC / Surcharge
	SEMCO Energy Gas Company	NPV Method	CIAC / Surcharge
Minnesota	CenterPoint Energy	Footage Allowance	CIAC / Surcharge
	Northern States Power Company (dba Xcel Energy)	Footage Allowance	CIAC / Surcharge
Mississippi	Atmos Energy Corporation	Footage Allowance	CIAC
	CenterPoint Energy	Footage Allowance	CIAC
	Spire Energy	Footage Allowance	CIAC
Missouri	Union Electric Company (dba Ameren)	Footage Allowance	CIAC
	Empire District Gas Company (dba Liberty Utilities)	Revenue/Margin Multiplier	CIAC
	Spire Missouri	Footage Allowance	CIAC / Surcharge
Montana	NorthWestern Energy	Dollar Allowance	CIAC
Nebraska	Black Hills Energy	NPV Method	CIAC

State	Utility	Allowance Portion	Excess Portion
Nevada	Southwest Gas Corporation	NPV Method	CIAC / Surcharge
	Sierra Pacific Power Company (dba NV Energy)	Revenue/Margin Multiplier	CIAC
New Hampshire	Liberty Utilities	Footage Allowance	CIAC
	Northern Utilities (dba Unutil)	NPV Method	CIAC
New Jersey	New Jersey Natural Gas Company	Revenue/Margin Multiplier	CIAC
	PSE&G	Revenue/Margin Multiplier	CIAC
New Mexico	New Mexico Gas Company	Revenue/Margin Multiplier	CIAC
New York	Consolidated Edison	Footage Allowance	Surcharge
	Central Hudson Gas & Electric	Footage Allowance	Surcharge
	National Fuel Gas	Footage Allowance	Surcharge
North Carolina	Public Service Company of North Carolina (dba Dominion Energy)	Footage Allowance	CIAC
	Frontier Natural Gas	Footage Allowance	CIAC
	Piedmont Natural Gas (dba Duke Energy)	Footage Allowance	CIAC
North Dakota	Montana-Dakota Utilities Corporation	Revenue/Margin Multiplier	CIAC
Ohio	The East Ohio Gas Company (dba Dominion Energy)	Footage Allowance	CIAC
	Duke Energy Ohio	Footage Allowance	CIAC
	Columbia Gas of Ohio	Footage Allowance	CIAC
Oklahoma	Oklahoma Natural Gas Company	Revenue/Margin Multiplier	CIAC
	CenterPoint Energy	Revenue/Margin Multiplier	CIAC
Oregon	Northwest Natural Gas	Revenue/Margin Multiplier	CIAC
	Cascade Natural Gas	Revenue/Margin Multiplier	CIAC
	Avista Utilities	Dollar Allowance	CIAC
Pennsylvania	Columbia Gas of Pennsylvania	Footage Allowance	CIAC
	UGI Utilities	Footage Allowance	CIAC

State	Utility	Allowance Portion	Excess Portion
Pennsylvania	PECO Energy Company	NPV Method	CIAC
	Peoples Natural Gas Company	Footage Allowance	CIAC
Rhode Island	The Narragansett Electric Company (dba Rhode Island Energy)	NPV Method	CIAC
South Carolina	Dominion Energy South Carolina	NPV Method	CIAC
	Piedmont Natural Gas (dba Duke Energy)	Footage Allowance	CIAC
South Dakota	MidAmerican Energy Company	NPV Method	CIAC
	Montana-Dakota Utilities	Revenue/Margin Multiplier	CIAC
	NorthWestern Energy	Footage Allowance	CIAC
Tennessee	Atmos Energy Corporation	NPV Method	CIAC
	Piedmont Natural Gas (dba Duke Energy)	Footage Allowance	CIAC
	Chattanooga Gas Company	NPV Method	CIAC
Texas	Atmos Energy Corporation	Footage Allowance	CIAC
	CenterPoint Energy	Footage Allowance	CIAC
	Texas Gas Service Company	NPV Method	CIAC
Utah	Dominion Energy	No allowance	CIAC / Surcharge
Vermont	Vermont Gas Systems	Footage Allowance	CIAC
Virginia	Washington Gas Light Company	NPV Method	CIAC
	Columbia Gas of Virginia	NPV Method	CIAC
	Virginia Natural Gas	NPV Method	CIAC
Washington	Avista Corporation	Dollar Allowance	CIAC
	Puget Sound Energy	Dollar Allowance	CIAC
	Cascade Natural Gas Corporation	NPV Method	CIAC
Wisconsin	Wisconsin Power and Light (dba Alliant Energy)	Footage Allowance	CIAC
	Wisconsin Public Service Company	Revenue/Margin Multiplier	CIAC
	Wisconsin Gas (dba We Energies)	Revenue/Margin Multiplier	CIAC
Wyoming	Black Hills Energy	Dollar Allowance	CIAC
	Dominion Energy	No Allowance	CIAC
	Montana-Dakota Utilities	NPV Method	CIAC