Alternative Regulation and Ratemaking Approaches for Water Companies

Supporting the Capital Investment Needs of the 21st Century

PREPARED FOR

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THE Brattle GROUP

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I. Executive Summary

Today, private water companies directly or through public-private partnerships provide essential water and wastewater services to nearly 73 million people in the United States, one fourth of our nation's population. It is undeniable that the U.S. water industry provides a vital public service, which is to maintain the highest standards of water quality set under federal and state laws. Over the next quarter century, the U.S. water industry faces a set of critical infrastructure investment needs that is expected to total between $335 billion to $1 trillion. This is to replace aging infrastructure and make needed investment to maintain water quality. In addition, the EPA estimates that after years of drought, up to 70% of the states face some form of water shortage and this will increase costs of water and perhaps require separate investments to ensure long-term reliable water supply.

This report provides a survey of policies that state regulators across the U.S. have developed to meet these challenges by improving traditional cost of service ratemaking in the electric, natural gas distribution and water industries. The report shows that the electric and natural gas delivery industries have in place a larger number and a greater variety of alternative regulation policies compared to the water industry. The water industry has made recent progress in innovative ways to recover capital investments in their distribution systems.

Under the general "regulatory compact", all private utilities are presumed to have a fair opportunity to earn their cost of capital, including the Commission-determined allowed return on equity. The traditional regulatory approach for setting prices is known as cost of service regulation and has been in place for at least half a century. During the formative stages in the second half of the 20th century, all infrastructure industries saw the demand for their products grow, usually faster than the economy. Growth rates in unit sales of water, electricity, and natural gas for residential and commercial customers have fallen and in some regions have been negative. Electric consumption grew at less than 0.5% during 2000-2010. Natural gas consumption stagnated back in the 1970s and had no growth during 2000-2010. Public supply water consumption per capita declined from 1990-2005. This has taken away a source of funds for future investments and for overcoming regulatory lag that is built into the regulatory process. Today traditional cost of service regulation alone is not well designed to meet the future needs of the water industry.

There are several unique issues for the water industry in using traditional cost of service ratemaking. First, the water utility industry is the most capital intensive among state regulated infrastructure industries. Recovery of these dominant capital investments solely through the traditional general rate cases is challenging. Second, the majority of water utilities are relatively small. Third, it may be difficult to overcome a perception by some members of the public of drinking water as a natural product that is cheap and readily available, so the water utility industry may need to be prepared to educate customers and rate case participants about costs and their relevance.

Because the water industry is the most capital intensive regulated industry, an efficient regulatory policy that puts private capital to work meeting a substantial share of the future infrastructure needs is vital. Maintaining creditworthiness and the ability to attract capital is therefore key. If after large investments are made, the regulatory process does not allow the recovery of capital costs in a timely manner, the capital markets will recognize the associated loss of earnings and will price capital accordingly. All of these issues could trigger a pattern of under earning if major capital investments were initiated. They imply that traditional cost of service regulation is unlikely by itself to be sufficient to facilitate the necessary future investment in the water industry.

This report focuses on policies that states have explicitly developed that go beyond the normal limits of traditional cost of service regulation to improve the outcomes. Electric and natural gas utilities, reflecting perhaps a greater degree of consolidation and historically larger cost of energy, are further along in developing and implementing alternative regulatory policies and ratemaking mechanisms to overcome the difficulties of traditional regulation. Here are the current results of the survey[1] for three important categories of alternative policies.

- **Revenue Stabilization**. These mechanisms, which include conservation adjustments and decoupling mechanisms, adjust base revenues, without addressing costs, between rate cases. They remove the conflict in the utility promoting efficiency and deal with falling sales from various sources. 27 states for electricity and 31 states for natural gas delivery participate in this kind of alternative regulation. For water, only 5 states have been identified as having this policy.
- **Comprehensive Alternative Ratemaking and Timely Recovery.** These are ways to move beyond the general rate cases of cost of service regulation and bring into rates future costs from investment projects and other sources. 34 states for

1 State counts often include DC. These are the current numbers at the date of publication, but this large set of regulatory policies frequently experiences a change in some state. Water industry professionals will need to keep up with the status of policies in place. NAWC is active in tracking this.

Electricity and 18 states for natural gas delivery have some form of comprehensive alternative regulation. For water, 4 states have been identified as having some form of comprehensive alternative regulation. In addition a number of states have the positive feature of a future or partially future test year in the traditional general rate case, which is a related, traditional policy that is surveyed, but not included in the count of states above.

- **Alternative Ratemaking for Capital Expenditures[2].** Distribution System Improvement Charge (DSIC) and Capital Expenditure (Capex) Riders are innovative means to collect the costs of standard investments to maintain the integrity of distribution systems. 17 states for electricity and 25 states for natural gas delivery have at least one kind of this alternative regulation For Water, 15 states have been identified as having these policies. While many of the water DSICs are recently enacted and not fully implemented, this is an important sign that progress is occurring in the water industry. The report focuses on Capex Riders as the timely recovery of capital expenditure is vital for an industry that is as capital intensive as the water industry.

  CWIP in rate base is a useful way of collecting the carrying charges during construction for large, independent, approved investment projects to reduce rate shock and maintain financial ratios. CWIP in rate base recovers financing cost of investment projects earlier than does the traditional AFUDC accounting. Because the nature of the CWIP that is allowed into the rate base differs across states and industries, the policies are not included in the count above.

All three industries are comparable because they are generally regulated by the same state commissions, serve a similar customer mix, and have very large infrastructure investments. The electric and gas utilities have a longer history of using innovative policies, so the water industry can learn from that experience. This is shown above in the higher count of states using the first two policies. However, all of these policies still have a long way to go.

For the third group, alternative ratemaking for recovering capital expenditures, water utilities have a level of experience and a penetration that resembles that of the electric and gas industry. This is an encouraging recent development. While the adoption of alternative regulation is very much an ongoing process, the water industry can certainly gain from understanding what has been accomplished and what barriers are still to be overcome. Then the lessons and the new approaches can be tailored to the unique issues the water industry must address in the future.

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2 Spelled out, these are Construction Work in Progress, Distribution System Improvement Charges, and Capital Expenditure Riders.

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II. Introduction – the Current Ratemaking Challenges of the Water Industry

A. Water Industry Challenges and Capital Requirements

Today, water companies directly or through public-private partnerships provide essential water and waste-water services to nearly 73 million people in the United States, one fourth of our nation's population[3]. It is undeniable that the U.S. water industry provides a vital public service, which must maintain the highest standards of water quality. The water quality standards are numerous and increasing, coming from the Clean Water Act and the Safe Drinking Water Act, with enforcement through the federal Environmental Protection Agency (EPA) and the state departments of environmental protection. The standards help safeguard the health and safety of American families.

The U.S. water industry now faces a set of critical infrastructure investment needs that is expected to total between $335 billion to $1 trillion over the next 20 to 25 years[4] and will substantially increase the overall investment in our national water and waste-water infrastructure. The National Association of Water Companies (NAWC) asked The Brattle Group (Brattle) to review the regulatory processes through which these massive investments will be regulated and recovered in rates. As part of NAWC's continuing efforts to draw attention to these important public policy issues,[5] this report provides a comprehensive review of policies that state regulators across the U.S. have developed to meet challenges by improving traditional cost of service ratemaking in the water, electric, and natural gas distribution industries[6,7].

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3 NAWC, *Private Water Service Providers Quick Facts.* "Nearly 73 million Americans receive water service from a privately owned water utility or a municipal utility operating under a public-private partnership". Population of U.S. currently estimated to be about 317 million.

4 Lower value is over 20 years and from: EPA Drinking *Water Infrastructure Needs Survey and Assessment, Fourth Report to Congress*, March, 2009. Higher value over 25 years from: American Society of Civil Engineers, *2013 Report Card for America's Infrastructure*, pp. 18-19.

5 This report continues the efforts reported in NAWC, *Moving Water Forward, Summary Report of Water Policy Forum for State Public Utility Commissioners,* April 22-24, 2012, prepared by Lila A. Jaber.

6 The scope of this survey does not include the variety of riders, trackers, clauses and adjustment mechanisms for operating costs. Some examples not covered are fuel and purchase power clauses in electric, commodity gas costs in gas delivery, and water and electric costs in water. There many more and a complete survey of these was too extensive for this study. Some are discussed. This report focuses on timely recovery of capital expenditures, which are vital for a highly capital intensive like the water industry. This is further discussed in Chapter III and IV.

7 The discussion of the alternative regulatory policies relies in part on several sources, including Edison Electric Institute (EEI), *Alternative Regulation for Evolving Utility Challenges: An Updated Survey,* Pacific Economics Group Research LLC, Jan. 2013, Institute of Electric Efficiency (IEE), *State Electric*

Continued on next page

NAWC represents the companies in the private side of the water industry, who are both owners and operators of water and waste-water utilities as well as members of a variety of public-private partnerships with public water companies.

In addition to aging infrastructure, the EPA estimates that after years of drought 36 states face some form of water shortage[8] and the cost of the water itself is increasing in many locations. Access to water has always been challenging in the Southwestern part of the U.S. and the 10 Western states that depend on the Colorado River and Rio Grande basins are seeing acute water shortages at this time.[9] As a result of the water shortage, water companies in the West may have to invest substantially in procuring new water resources. In other areas of the country, water supplies are becoming degraded through contamination or reduced capacity.

All of these new requirements are to be met by an aging water infrastructure, increasing the demand for limited capital resources. Insufficient infrastructure investment can lead to the possible future degradation of drinking water and ecosystems, as well as inefficient operation of systems, greater water loss, and higher cost. The experience of other regulated industries shows there are innovations in regulation that make more efficient use of regulatory resources by both utilities and regulators and still protect the public interest. Without some use of alternative regulatory approaches, today's users may be unwittingly passing an even larger burden on to the next generation.

The future of water needs effective and efficient regulatory policy that puts private capital to work meeting a substantial share of the future infrastructure needs. Modern capital markets, while not without their issues, are highly developed mechanisms to assess expected returns and risks on the wide variety of national and international investments. The expected returns in the water industry must ultimately be reasonable in comparison with the available expected returns on other investments of similar risk. This is backed by legal precedent, finance theory and considerable evidence. The greater the "non-diversifiable" risks[10] of the investment, the larger must be the return so as to compensate.

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Efficiency Regulatory Frameworks, July 2013, and American Gas Association (AGA), *Natural Gas Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms Current List*, Cynthia J. Marple, power point presentation, Sept. 2012. Where there are disagreements, Brattle has decided what policies to include for a state.

8 EPA, Water Conservation (http://www.epa.gov/oaintrnt/water/).

9 This was reported by Ken Salazar, former Secretary of the Interior, in the National Journal, "Salazar: Western U.S. Facing Water Shortages," October 5, 2011.

10 Diversifiable risks are those variations in the returns of individual stocks that are unpredictable, but statistically regular. Weather variation for electric utility stocks is diversifiable. Inside a portfolio of stocks, they cancel each other out, leaving the portfolio value stable. Non-diversifiable risks are those that cannot be hedged within a portfolio.

At the state level, the water utilities are regulated by independent public utility commissions. Figure 2.1 shows the states with regulated water companies and by comparison the seven states that do not have regulated water companies: Georgia, Michigan, Minnesota, Nebraska, North Dakota, South Dakota, and the District of Columbia.

Water regulation involves the traditional "regulatory compact" in which the water utility gets a franchise or exclusive right to provide water in a defined service territory and a fair opportunity to earn its cost of capital. In response the utility agrees to provide clean water in compliance with all national, state, and local laws and regulations to its customers and to charge rates that are expressly approved as just and reasonable by its regulatory commission. The traditional regulatory approach for setting prices is known as cost of service regulation (COSR) and has been in place for at least half a century, since the classic treatise was published in 1961[11]. Just and reasonable base rates recover all prudent costs for capital, labor, materials, and input services used in the production function (including the cost of capital). A "general rate case" is the specific regulatory process in a state used to determine and then adjudicate in a full hearing process the cost of service[12], with the purpose of balancing the interests of ratepayers and investors.

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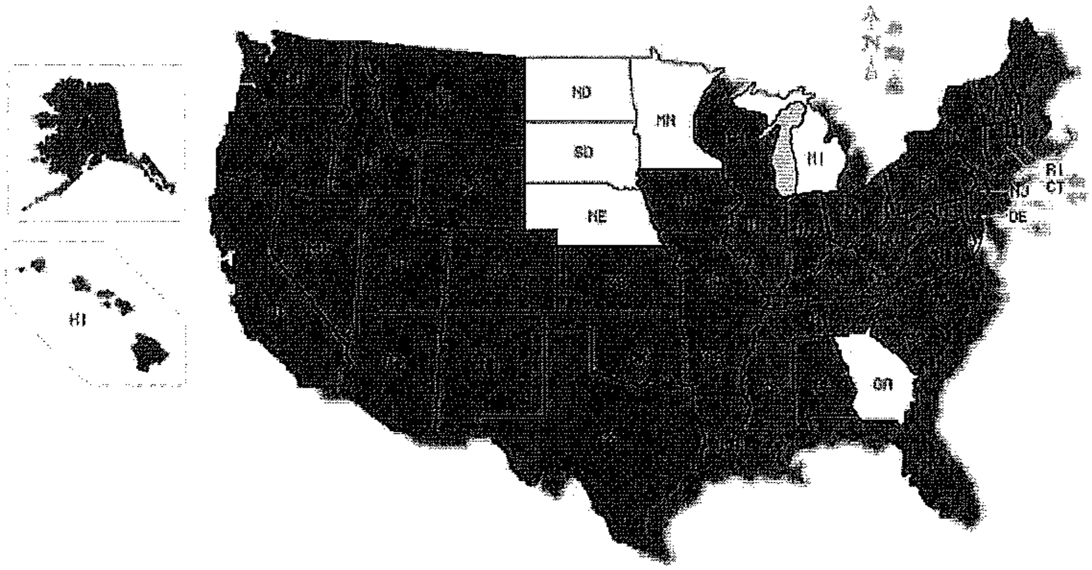
11 James Bonbright, *Principles of Public Utility Rates*, 1961.

12 COSR is a two-step process, with the first step being what cost of service should be recovered when, as discussed above. The second step is the determination of the precise rates charged for all services of the different classes of customers so that the aggregate cost of service will be collected. This report only addresses the first step

Figure 2.1: States Having Water Company Regulation[13]



States With Regulated Water Companies	States Without Regulated Water Companies
Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana , Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Missouri, Montana , Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont , Virginia, Washington, West Virginia, Wisconsin*, Wyoming	District of Columbia, Georgia, Michigan, Minnesota, Nebraska, North Dakota, South Dakota

*Wisconsin allows private water companies, but the Public Utilities Holding Act of WI creates a high legal/regulatory barrier for them to enter the market.

As discussed above, water rates will need to be adjusted to recover the large coming capital investments in water infrastructure and any water scarcity costs, in addition to the normal increase in overhead and maintenance costs, like health and pensions. The usage of water per

13 Sources: The Brattle Group © 2013 and NAWC.

capita has been decreasing, so no significant investment funds will come from growing unit sales. Because the general rate case reviews all capital and operating cost items and judges whether they are "prudent", it is very time and resource-intensive and frequently backward looking as well. Thus, traditional cost of service regulation is not designed to meet the future needs of the water industry. As utility income and investors' expected return depend on the revenue, costs and the prices charged for water service, the future of the regulatory framework is a crucial element for any regulated utility's investors and therefore for its capital attraction.[14]

B. Unique Water Industry Issues with Traditional Cost of Service Regulation

There are several unique issues for the water industry in using traditional cost of service. First, the majority of private water utilities are relatively small. Second, the water utility industry is very capital intensive. Third, it may be difficult to overcome a perception that water is cheap and readily available, so the water utility industry may need to be prepared to educate rate case participants and consumers in general about costs and their relevance.

Differences in the Number and Size Distribution of Companies across the Three Industries

Regulated electricity and natural gas utilities are comprised of relatively fewer, larger regulated entities than are in the water industry. This was not always the case, but the consolidation of the electric and natural gas industries was actively pursued for most of the 20th century and still continues. The water industry has some large holding companies[15], but in contrast has many more and smaller regulated operating units than is common in the electric and gas utilities industry. Moreover, rate consolidation or single tariff pricing is much less common than in the electric or natural gas industry.

There are about 3,200 electric companies[16], and 94% are smaller, non-profit municipal systems and rural cooperatives that are small on average[17]. The remaining 193 companies, or 6%, are

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14 This was a key issue in the resolutions regarding the water industry that the National Association of Regulatory Utility Commissioners' recently passed. Specifically, resolution WA-3 asks that "economic regulators carefully consider and implement appropriate ratemaking measures as needed so that water and wastewater utilities have a reasonable opportunity to earn their authorized returns within their jurisdictions" and WA-2 "conceptually supports review and consideration of the innovative regulatory policies and practices identified herein as 'best practices' in the regulation of small water systems." Passed July 24, 2013.

15 For example, the total market capitalization of American Water, at more than $7 billion, is larger than that of most of the natural gas delivery holding companies.

16 "2013-14 Annual Directory & Statistical Report - U.S. Electric Utility Industry Statistics," The American Public Power Association. Available at: http://www.publicpower.org/files/PDFs/USElectricUtilityIndustryStatistics.pdf

large private, investor-owned systems and account for 55% of the retail, end-use electric service provided to U.S. consumers and a larger share of the distribution revenues and investment.

There are about 1,300 natural gas local distribution companies (LDCs), which excludes entities in the intrastate and interstate gas pipeline business. The total number of companies can be broken down into investor-owned (20%), public municipalities (71%), public coops (1%), and private companies (8%)[18]. In terms of volumes of gas distributed, the sizes are: investor owned utilities (92%), municipalities (6%), and coops and privates, together (2%). In terms of the numbers of end-use customers, which do not include power plants, the sizes are investor owned utilities (91%), municipalities (7%), and coops and privates, together (1%).

In contrast, there are just over 50,000 community water systems with a wide distribution of sizes. In a variety of ways, the water companies act to maintain compliance with the provisions of the Safe Drinking Water Act, the Clean Water Act, and a variety of state and local policies. Within this large and diffuse water industry, the private, investor-owned water companies provide water to just under one-quarter, or 23%, of people in the U.S. by ownership and as operator through public-private partnerships.

The cost of preparing detailed rate filings is not necessarily proportional to the dollar values that are at stake in these proceedings. The smaller the company, the larger the cost of a traditional rate proceeding is relative to the amount of revenue at issue. This can absorb too many resources in the regulatory process, so the approaches need to be different for large and small water utilities. Because of the small size of many water utilities, alternative mechanisms that allow for a more streamlined approach to setting rates have a greater appeal in the water industry than among other regulated utilities. For example, regulation of water companies by the California Public Utilities Commission separates the Class A utilities, with over 10,000 connections, from all smaller, Class B utilities. The regulation of Class B utilities is relatively simple and there is a policy to provide incentives for larger companies to acquire or to operate small water and sewer utilities, because "smaller water companies often do not have the resources or expertise to operate in full compliance with increasingly stringent and complex water quality regulations."[19,20]

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17 There are some large, public, non-profit electric systems, like the Long Island Power Authority and Los Angeles Department of Water and Power. See http://www.publicpower.org/files/PDFs/100LargestPublicPowerUtilitiesbyElectricRevenues2009.pdf

18 This is 2008 data. See EIA, *Distribution of Natural Gas: The Final Step in the Transmission Process*, Office of Oil and Gas, June 2008.

19 See the CPUC, *Water Action Plan*, October 2010.

20 Ibid. p. 9. Moreover, the regulation of the Class A water companies has considerable similarities with that for California's very large electric and gas utilities, which employ extensive alternate regulation approaches and go far beyond traditional COSR.

One of the involved parts of COSR is the determination of the cost of capital, which is the weighted average of, first, the cost of equity that is complicated and controversial, and, second, the cost of debt that is known and measurable. A good example of simplification of traditional COSR is the determination of the cost of equity for water companies in Massachusetts. The water companies may use an "Optional Formula for Determining Allowed Rates of Return on Equity for Water Companies," which allows the use of a simple formula to determine the return on equity[21].

Capital Intensiveness of Water Relative to Electricity and Gas

The water industry is the most capital intensive among regulated infrastructure industries. It has an asset turnover ratio (revenues to total average assets) that averages 23%, while the revenues to assets ratio for the electric and natural gas utilities average 36% and 61%, respectively.[22] The comparable figure for industries that are not capital intensive is much higher. Because most of the assets belonging to a water utility are long-term fixed property, plant, and equipment, most costs cannot readily be reduced in the short or even medium run. Therefore, any reduction in revenues has a very large impact on the utility's bottom line (income or earnings), so timely and full recovery of capital expenditures is crucial for the financial health of the water industry. The recent legislation and rule making regarding capital recovery mechanisms (the Distribution System Improvement Charge, or DSIC) are good measures to address part of this issue.

C. Similarities in Policy-Driven Capital Requirements for the Electric and Natural Gas Industries

As discussed above, there are two other large infrastructure industries, electricity and natural gas distribution. These two industries face capital needs for major upgrades and have traditionally been regulated by the similar cost of service processes. Let us first look at similarities with water in terms of the investment challenges. Some specific challenges for the electric industry are:

- Retirement or upgrading of coal plants in the face of EPA's timetable on meeting the Mercury and Air Toxic Standards (MATS).[23]
- Investment in new transmission, generation, and systems to integrate remotely-located, renewable, generally intermittent resources to meet renewable portfolio standards.
- An aging transmission and distribution infrastructure in many of the nation's older cities.

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21 220 CMR 31.00; M.G.L. c. 165 §§ 1B, 2.

22 Source: *The Brattle Group* based on data from *Value Line Investment Survey*.

23 See for example: EPA, *Fact Sheet UPDATES OF THE LIMITS FOR NEW POWER PLANTS UNDER THE MERCURY AND AIR TOXICS STANDARDS (MATS)*, 2013.

The natural gas industry faces major challenges, including:

- The changing landscape for U.S. natural gas supply brought about by shale gas.
- Aging infrastructure and safety concerns that create the need for many gas mains need to be dug up and replaced.
- Efficiency technologies, conservation programs and the expectation of high future natural gas prices led in the past to stagnation in gas consumption by residential and commercial sectors, the locus of delivery companies' investment.

In many states, the private electric and natural gas delivery utilities are in a good position to meet these new challenges both in terms of raising capital and adjusting rates. This is because they have long been working with their regulators to find innovative ways to adjust rates to recover specific kinds of costs and to move base rates in general in a forward looking manner. This report covers a wide variety of these existing state policies and discusses them in three broad categories:

- Revenue Stabilization including Conservation Adjustments, and Decoupling
- Comprehensive Alternative Regulation including more traditional timely recovery mechanisms
- Alternative Ratemaking for Capital Expenditure including DSIC, Capital Expenditure Riders, and CWIP.

In general, many of the lessons from the electric and gas industries are applicable to the water industry, particularly when the companies are comparable in size. Before we move on to that discussion, there are two caveats that need to be mentioned.

State Regulatory Structures for Electricity and Natural Gas

State by state, most of the same regulatory agencies oversee the investment decisions and the ratemaking processes through which the infrastructure investments are recovered for the three industries. Unlike water, there are two different structural forms for both the electric and the natural gas industries in the U.S., depending on the state. The first form is the traditional vertically integrated utility. The second form is to separate the delivery services of the wires or pipeline business from the commodity electricity (kilowatt hours) and natural gas (thousands of cubic feet). Delivery remains rate regulated by COSR, but the retailing of the commodity is open to competitive entry and choice (sometimes called retail power deregulation) in some states[24].

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[24] For retail electricity, there are 18 states (incl. DC) that currently have competitive choice.

See www.eia.gov/todayinenergy/detail.cfm?id=6250. For retail natural gas, there are 14 states that currently have competitive choice for a substantial set of customers, although some states are inactive or restricted.

Continued on next page

These differences are useful to recognize when considering different states. However, in the opinion of the authors, the infrastructure investment costs related to distribution and transmission of both electricity and natural gas are still regulated in all U.S. states, whether the state is vertically integrated or using retail choice. There are important lessons for the water industry in all states.

To meet the new challenges, the electric and natural gas industries have in the last decade worked to improve regulatory institutions, tax policies, and create a business climate that encourages the investor-owned utilities to invest and efficiently manage their operations. Because of the larger consolidation and the historically larger cost of energy, the electric and natural gas utilities have developed and implemented a wide variety of alternative regulatory policies and ratemaking mechanisms to overcome the difficulties of traditional COSR. While this is very much an ongoing process, the water industry can gain from understanding the application of alternative regulatory policies and ratemaking mechanisms in the electric and natural gas utilities industry. Then the lessons and the new approaches can be tailored to the issues the water industry faces.

The rest of the report is organized as follows. Chapter III has two sections that discuss, first, traditional cost of service regulation in more depth and second, the nature of regulatory lag for high fixed cost industries in the modern era of low or no growth in the total consumption of the commodity. Chapter IV has three sections and they discuss the major categories of alternative regulatory and ratemaking polices. For each, the policies sanctioned for use across the states by electric and natural gas distribution utilities are compared with the water utilities in the same states. Chapter V summarizes the conclusions for future regulation in the water industry from the review carried out in Chapter IV.

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See http://www.eia.gov/oil_gas/natural_gas/restructure/restructure.html

III. Traditional Regulatory Institutions in the Modern Era of Conservation and Low Growth

A. Traditional Cost of Service Regulation

At the state level, all three industries are generally regulated by independent public utility commissions. The traditional regulatory approach known as cost of service regulation (COSR) has been in effect since the 1950's. A regulated utility in general cannot change its base rates without first getting permission from its regulator. Base rates recover all prudent costs for capital, labor, materials, and input services used in the production function. A "general rate case", or GRC, is the regulatory process specific to each state used to adjudicate and determine in a full hearing process the precise rates that can be charged for all services to all classes of customers. This is a three step process.

- The level of all the capital and cost elements that go into producing and distributing the services are determined and summed to get the aggregate revenue requirements.
- Revenue requirements are allocated across functional categories such as the total size of the commodity taken and the maximum through-put rate, then to rate classes, like residential, commercial and industrial.
- Individual rates are set by dividing the aggregate dollars by the expected number of billing units for each class: *E.g.*, Acre-Feet for water, Thousand Cubic Feet (MCF) for gas, and kilowatt-hours (kWh) and kilowatts (kW) for electricity.[25]

The GRC by its nature is detailed and precise, but is also a very resource and time intensive process for the utility, the commission and its staff, and the interveners. A GRC can take from six months to twelve months, and sometimes years. Regulatory lag can be measured as the number of months between the last month of the test period for which the data used in the GRC was collected, and the first month that the new rates actually go into effect. If the utility is investing substantially in new infrastructure (or during times of inflation), has increasing expenses, a longer regulatory lag makes it difficult to recover costs and earn the allowed rate of return.

B. Regulatory Lag and Its Solutions

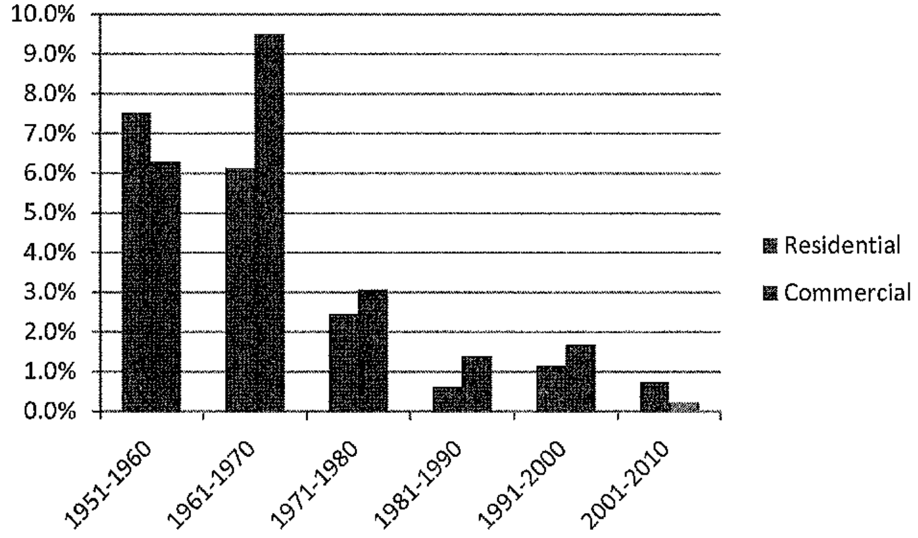
With fuel and later purchased power out of the base rates, the electric utilities still collected the majority of their costs in base rates set in a GRC. Therefore, the balance discussed above was very real and depended on the growth in revenues being driven by an underlying growth in

[25] It is becoming more common to include some monthly fixed charges on the customers' bills, so that not all charges vary with volume. The fixed charge is usually small relative to the utility's fixed costs.

demand for electricity. Natural gas had a similar removal of the commodity gas costs from base rates.

For electricity, Figure 3.1 indicates the history of the sales growth on average in the U.S. residential and commercial sectors that supported this cost of service regulation balance. The bold values show that in the modern period, especially when economy has faltered, sales growth has become very small. Whether sales are truly going to zero or negative is not the key issue, since the problem of regulatory lag appears before that. However, industry commenters have pointed out that negative growth will certainly make the problem worse.[26]

Figure 3.1: Trends in Annual Growth Rate of Total Electricity Use by U.S. Residential and Commercial Customers, 1950 – 2010[27]



For natural gas delivery, Figure 3.2 indicates the history of the sales growth in the residential and commercial sectors.

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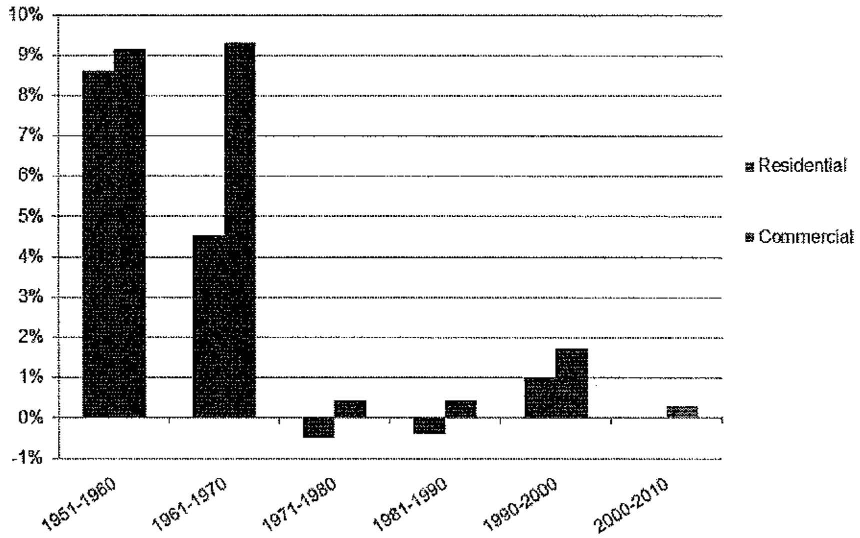
26 See Peter Fox-Penner, *Smart Power: Climate Change, the Smart Grid, and the Future of Electric Utilities*, 2010 and updated editions.

27 "U.S. Natural Electricity Total Consumption (MMcf)," *Energy Information Administration*, April 13, 2013.

Figure 3.2: Trends in Annual Growth Rate of Total Natural Gas Use by U.S. Residential and Commercial Customers, 1950 – 2010[28]



Note: From 2000 to 2010, the growth rate for residential was zero.

There is a comparable trend in water usage as shown in Figure 3.3. This figure shows growth rates in the public supply withdrawals of water from 1950 – 2005 from groundwater, surface water and ocean sources (saline water is for thermoelectric power plants, comprising 15% of total withdrawals). From 1990 to 2005, the public supply use per capita declined by. 0.3% per year[29]. From 2001 – 2010, residential water use per customer nationally declined by 1.4% per year[30]. The category "public supply" is defined by the US Geological Survey as public and private companies supplying 15 or more people, who are domestic, commercial and some industrial customers. Public supply with 11% of total withdrawals, is third category in size, behind thermoelectric generation with 49% and irrigation with 31%.

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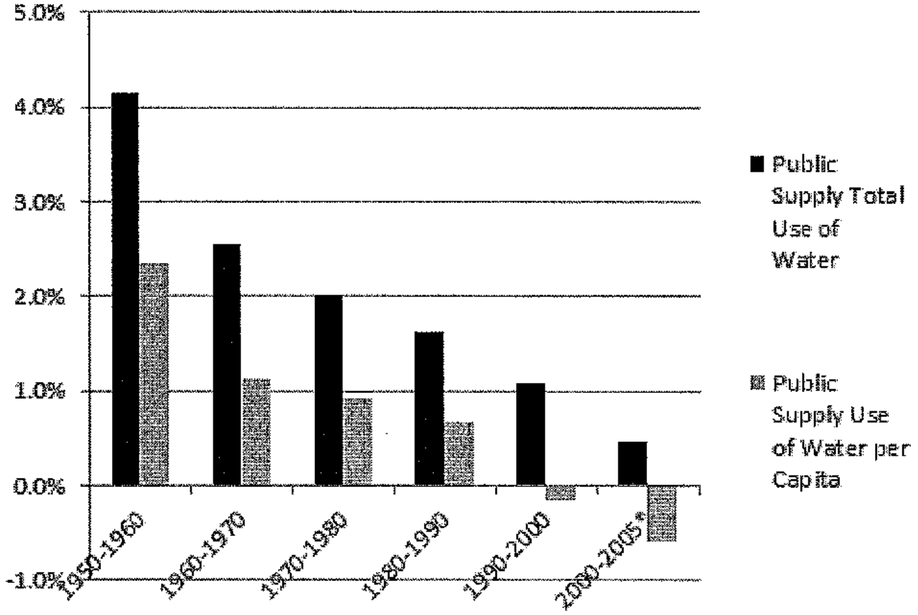
28 "U.S. Natural Gas Total Consumption (MMcf)," *Energy Information Administration*, April 13, 2013.

29 U.S. Department of the Interior and U.S. Geological Survey, *Estimated Use of Water in the United States in 2005*, Circular 1344. This report presents water-use estimates by source and by State for eight categories of water use for 2005. Sources include surface water and groundwater, both fresh and saline. Categories include public supply (11%), domestic (1%), irrigation (31%), livestock (<1%), aquaculture (2%), industrial (4%), mining (1%), and thermoelectric power (49% incl. all saline). Public supply refers to water withdrawn by public and water suppliers that provide water to at least 25 people or have a minimum of 15 connections. Public-supply water is delivered to users for domestic, commercial, and industrial purposes, and also is used for public services and system losses.

30 Margaret Hunter, et al., Declining Residential Water Use Presents Challenges, Opportunities, *OpFlow*, American Water Works Association, May 2011.

Figure 3.3: Trends in Annual Growth Rates of Public Supply Water in Total Use and Use Per Capita in U.S., 1950 – 2005



Some regulators may be subject to public pressure, particularly in hard economic times, to hold down prices of vital services. An enduring Supreme Court standard is that when private utilities make prudent investments "in the public interest" regulatory bodies must provide a fair opportunity to earn the allowed rate of return on capital.[31] Rates for low income customers can address the equity issue.

Between GRCs and decisions by the regulatory commission, the existing rates remain in effect and revenue grows or shrinks with billing units based on sales. Thus rates are fixed even when there is clear and known inflation in many cost elements and a given utility continues to invest in the production and distribution systems to serve new customers. This was achieved by a "Cost and Sales Balance". For much of the last 60 years in many states, the time intensive GRC for electric and gas utilities could be done only every few years, and yet a reasonable balance could still be achieved, investment continue to be undertaken, and profits earned at neither too low nor too high a level. These outcomes were monitored frequently by the interested parties, certainly including the investment community. One reason was because as the U.S. economy

31 The Hope Natural Gas decision established the principle that utilities making investments in the public interest should have a fair opportunity to earn their cost of capital, which is what is earned by other investments of similar risk. U.S. Supreme Court, Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).

was growing, the base revenues increased from increased usage, especially usage per customer. This rising revenue frequently covered the two most important rising cost categories: first, the recovery of capital costs of new investments and second, inflation in O&M. Estimates vary across industries and states, but 1% to 2% per year productivity growth is indicative of U.S. experience. The growth of aggregate costs is 4% historically.

The figures above show that rising billing units coming from a growing economy no longer provide a reliable balance in cost of service ratemaking. In fact, in the face of resource scarcity and the expected benefits of efficiency in energy and water consumption, the reduction or elimination of growth is an explicit policy goal, in which the regulated utilities are a prime mover. The alternative regulatory policies discussed in this report are the new ways to achieve the old balance the general rate cases no longer provide.

Today, the combination of low expected future growth combined with high future investments requirements and rising environmental costs has destroyed the prospect that traditional cost of service regulation through general rate cases can reestablish a balance. Balance in all three industries can be established only by strongly supplementing COSR with alternative regulatory mechanisms. These alternatives can either lead to a broad reshaping of rate regulation or a more focused and targeted regulatory solution. The electric and natural gas industries came to this realization in the last decade. It has been challenging in many states and not universally achieved, but alternative regulatory policies by legislative bodies and regulatory commissions have been pursued.

IV. Types of Alternative Regulatory Policies: Comparing Electric and Gas with Water Industry

A. Introduction

There are a variety of alternative regulatory policies that have been developed to phase in rate increases, assist utilities in meeting financial obligations, and to reduce the regulatory burden. This report surveys three classes of such mechanisms starting with features that either help update the costs and investments relied upon in rates or take a more forward looking approach to setting rates. First, the report covers mechanisms that help stabilize revenue and recover incurred fixed cost, when use declines, often related to efficiency and conservation. Second, the report discusses more comprehensive regulatory mechanisms that may allow for rates to be recalculated outside the single general rate case paradigm by, for example, the use of formula rates that change over time or multi-year rate cases. Use of a future test year, an older policy, is discussed as well. Third, the report discusses using Capital Expenditure riders and Distribution System Improvement Charges (DSIC) that recover certain kinds of capital expenditures outside of the rate case. In the third section, the allowance of Construction Work in Progress (CWIP) in rate base for major construction projects is also discussed, although it is a more traditional form of regulation.

In addition to Capex Riders and DSIC, there are a host of other riders and trackers that recover specified kinds of operating costs without a rate case and can be an important way to reduce regulatory lag. The report focuses on and surveys states with Capex Riders and DSICs for several reasons. First, these riders relate more directly to the future infrastructure investment issues the water industry faces. Second, other riders vary substantially in numbers and types across states and utilities and they were not covered in the secondary sources on electric and gas industries that this report has cited. Thus, surveying other riders in the electric, gas and water industries would have constituted a much larger survey effort and was beyond the scope of the project. Their absence from this survey does not imply that these other types of riders are not important. The authors are aware that other riders can be very important and believe them to be numerous for certain industries or states.[32].

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32 As anecdotal evidence, consider Pacific Gas & Electric's current Tariff Book. In the Table of Contents, there is a list of riders for electric service (as we have used the term), which are listed under the names of Adjustments, Memorandum Accounts, Revenue Adjustment Mechanisms, and Balancing Accounts. While they may not all be active and are of different sizes, the total number of riders is more than 80. http://www.pge.com/tariffs/ Electric and gas utility tariff books all contain lists, although most are not that extensive. For more information on the prevalence of such riders and trackers in the electric and natural gas utility industry, see Regulatory Research Analysts, "Regulatory Focus: Adjustment Clauses," June 6, 2013. Regulatory Research Associates do not provide similar publications for the water industry.

B. Revenue Stabilization

Between general rate cases, revenue can be stabilized by conservation adjustment or decoupling policies that disconnect the amount base dollar revenue collected from actual billing unit sales[33] and target revenues to other metrics.[34] Decoupling policies do nothing about cost changes; that is not their purpose. Decoupling policies are generally limited to the residential and commercial classes, where most of the base revenue is collected to cover the investment and O&M costs of distribution and sometimes transmission.

Decoupling polices differ in the scope of the target and means to stabilize. There are three decoupling schemes that are surveyed although we caution that the implementation of the mechanisms vary across jurisdictions:

- Conservation Adjustments and General Decoupling with Periodic True-up (including separation of revenue from total billing unit sales, from usage per customer sales, and other schemes)
- Lost Revenue Adjustment Mechanism
- Fixed Variable Rate Design

In many cases, decoupling policies continue to evolve from the same policy basis of the earliest decoupling, which was instituted in California in the early 1980's. Decoupling is found by regulators as being "in the public interest" when they determine that decoupling increases and restores the base revenue lost when utilities carry out policy directives to pursue aggressive conservation or energy efficiency (EE) targets. There is little dispute that when conservation programs achieve their targets, at the same time they reduce collection of base revenues until another general rate case. Customers cannot achieve the promised bill savings without this revenue reduction. Thus, the utility starts with internal disincentive, sometimes called the "throughput disincentive", to aggressively meet conservation goals.

Decoupling has an additional benefit if while costs continue to increase, the billing unit sales are decreasing over the long run for reasons outside of the utility's programs. This has frequently been found in natural gas delivery.

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33 For the different industries, the typical billing units are kWh and kW demand of electricity, thousand cubic feet (MCF) of gas, and hundred cubic feet (CCF) of water.

34 See EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Chapter III Revenue Decoupling, Pacific Economics Group Research LLC, Jan. 2013 and IEE, *State Electric Efficiency Regulatory Frameworks*, July 2013.

a. Revenue Stabilization

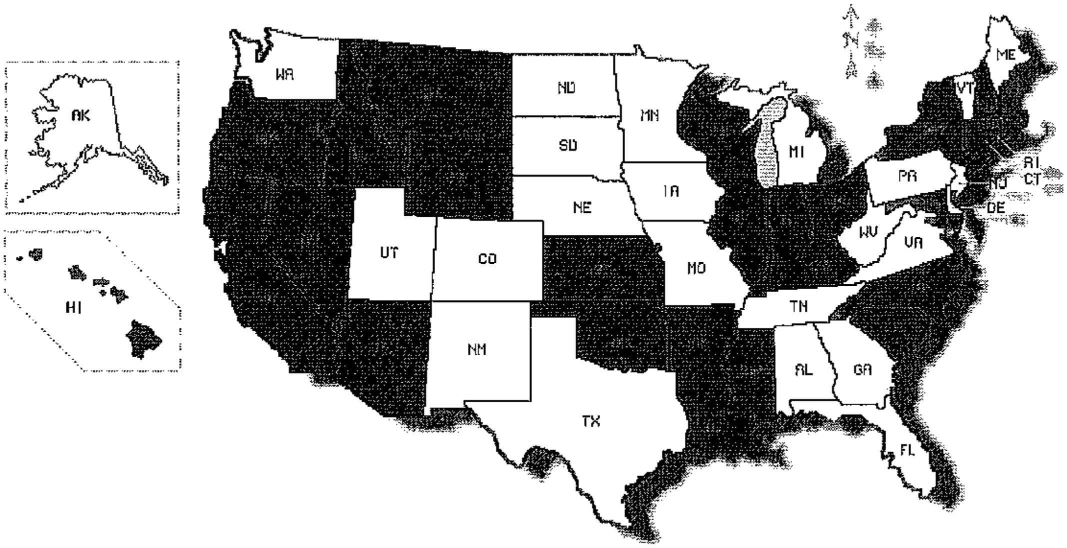
This the most common form of revenue stabilization. As well as curing the disincentive from conservation impacts, this can help mitigate the situation where slowing or falling unit sales increased the problem of regulatory lag. There are two components to a general decoupling scheme. First is a revenue target adjustment mechanism and second is the decoupling mechanism. The revenue target mechanism sets the level of revenues that are allowed to be collected in each period[35]. Periods may be one year or less. One target is to increase the revenue in the same proportion as customers increase. This is revenue per customer freeze decoupling, a very common variety. This allows revenues to grow in proportion to the growth in customers.

A broad based revenue target mechanism may compensate the utility for several kinds of cost pressures. In this effect, decoupling can be very similar to a multi-year rate plan, discussed above in this chapter.

The decoupling mechanism adjusts rates to achieve the revenue target. The mechanism may or may not have caps on the adjustment in one period, with so-called "soft" decoupling allowing the utility to recover the revenue shortfalls that occur under the cap. Decoupling mechanisms are frequently directed only at the residential and commercial business customers, who account for a large share of the distribution base revenues. These rate classes may or may not be disaggregated for truing up. Figures 4.1, 4.2, and 4.3 below show the states that support one or more of the forms of the Conservation Adjustment and the General Decoupling for electric, gas distribution, and water utilities, respectively.

[35] See EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Chapter III Revenue Decoupling, Pacific Economics Group Research LLC, Jan. 2013.

Figure 4.1[36]: Conservation Adjustments and General Decoupling with Periodic True-up for Electric Companies



Conservation Adjustments and General Decoupling with Periodic True-up for Electric Companies
Arizona, Arkansas, California, Connecticut, District of Columbia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Montana, North Carolina, New Hampshire, Nevada, New York, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Wisconsin, Wyoming

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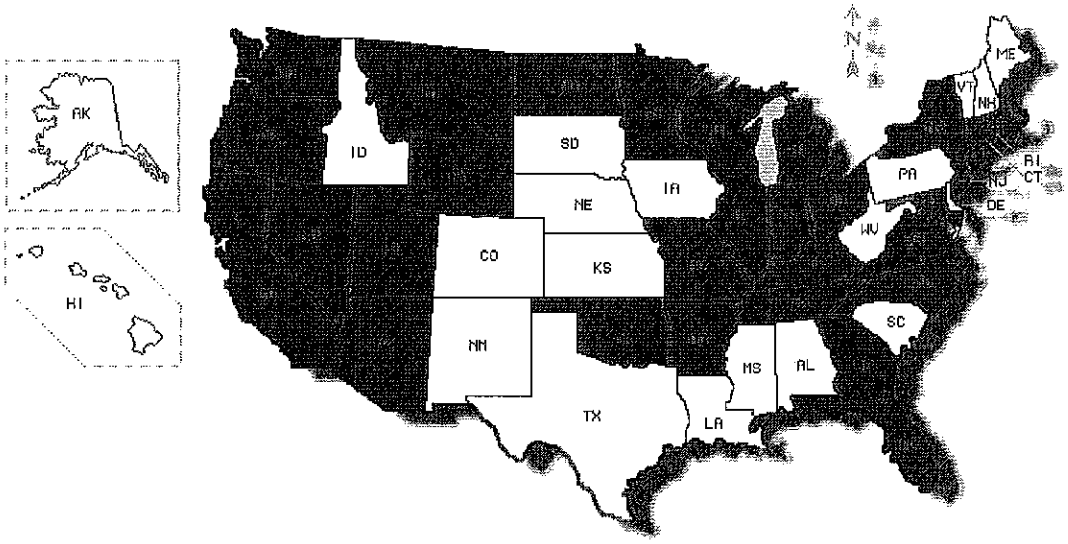
36 The Brattle Group © 2013 and EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Prepared by: Pacific Economics Group Research LLC, January 2013.

Figure 4.2[37]: Conservation Adjustments and General Decoupling with Periodic True-up for Gas Companies



Conservation Adjustments and General Decoupling with Periodic True-up for Gas Companies
Arkansas, Arizona, California, Connecticut, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, North Carolina, North Dakota, New Jersey, Nevada, New York, Ohio, Oklahoma, Oregon, Rhode Island, Tennessee, Utah, Virginia, Washington, Wisconsin, Wyoming

A small but growing number of states have decoupling or similar mechanisms for water: AZ, CA, CT, NV and NY. They are concentrated in the West where water is scarce and the Northeast, where conservation is an important public policy. Clean water, saving the aquifers, and other water policies are viewed as socially beneficial in the same way as energy efficiency.

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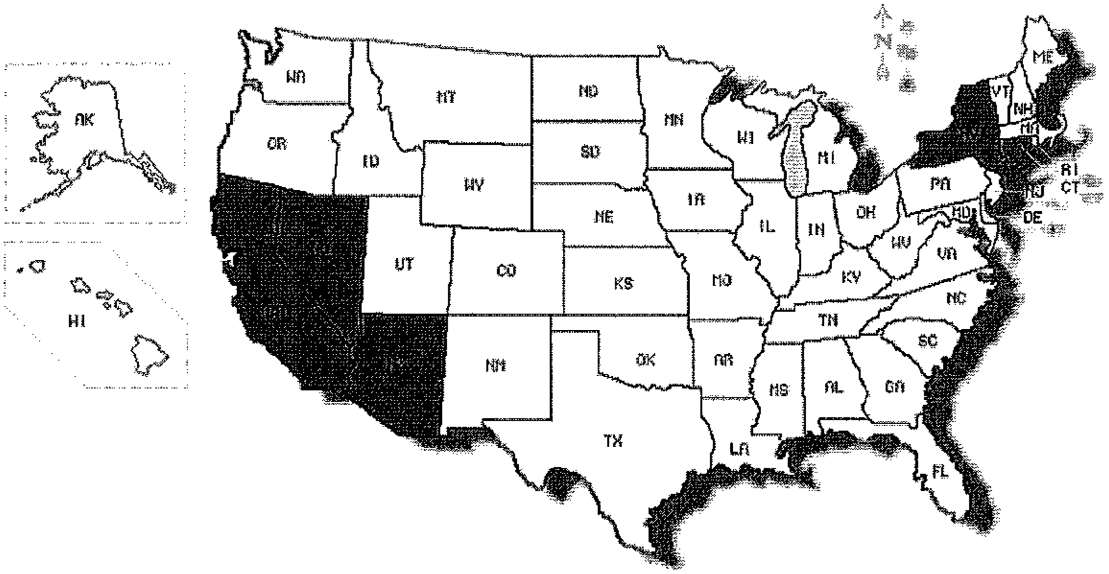
37 The Brattle Group © 2013 and EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Prepared by Pacific Economics Group Research LLC, January 2013.

Figure 4.3[38]: General Decoupling with Periodic True-up for Water Companies



General Decoupling with Periodic True-up for Water Companies
Arizona, California, Connecticut, New York, Nevada

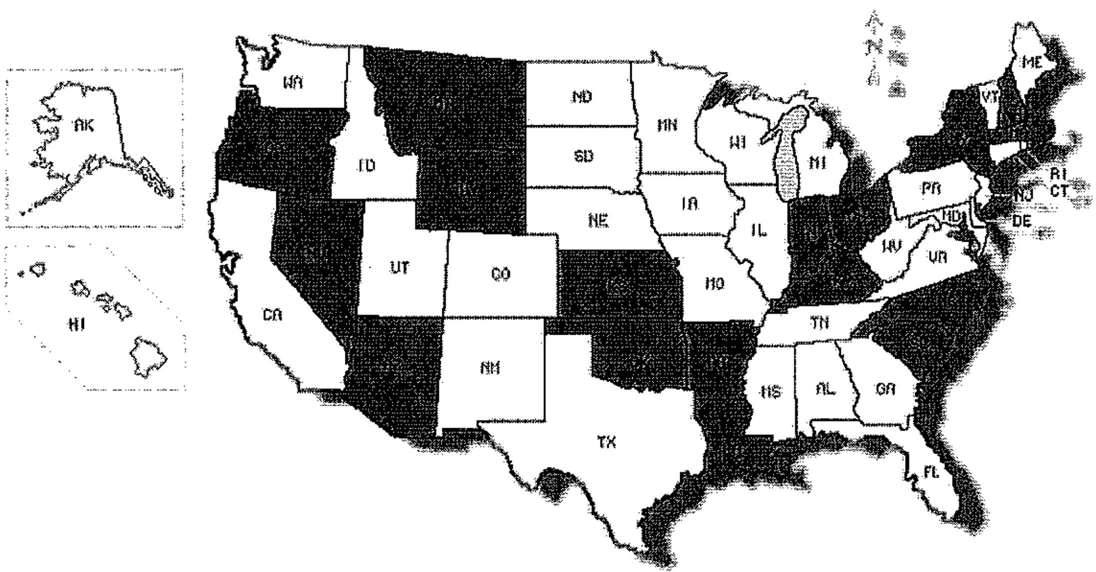
b. *Lost Revenue Adjustment Mechanism*

The second form of decoupling focuses only the lost revenue that can be attributed to the utility's own Conservation, Energy Efficiency, Demand Side Management, and sometimes Distributed Generation programs. To date this mechanism has only been used in the electric and natural gas industries. Other well-known factors that impact sales are weather, economic activity, total and marginal price changes, and randomness. They are not considered here. The total revenue impacts of the conservation programs each year are the product of the total billing unit impacts *multiplied by* the volumetric unit base rates. Those billing unit impacts are reduced kWh of electricity (and sometimes billing kW), MCF of natural gas, and CCF of water. They must be estimated based not on the program's plan, but rather on the program's actual results. This can be projected and later trued up or the recovery can be delayed until the measurement and evaluation is complete, typically a year or so.

38 The Brattle Group © 2013 and NAWC.

The estimated impacts are a combination of the annual program savings and some part of the expected impact lifetimes, which lead to growing impacts as the programs are repeated over the years. Past impacts would generally be incorporated in the test year sales, so a general rate case will truncate the lost revenue recovery[39,40].

Figure 4.4[41]: States with Lost Revenue Adjustment Mechanisms (LRAM) for Electric Companies



States with Lost Revenue Adjustment Mechanisms (LRAM) for Electric Companies
Arizona, Arkansas, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Montana, Nevada, New Hampshire, New York, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, Wyoming

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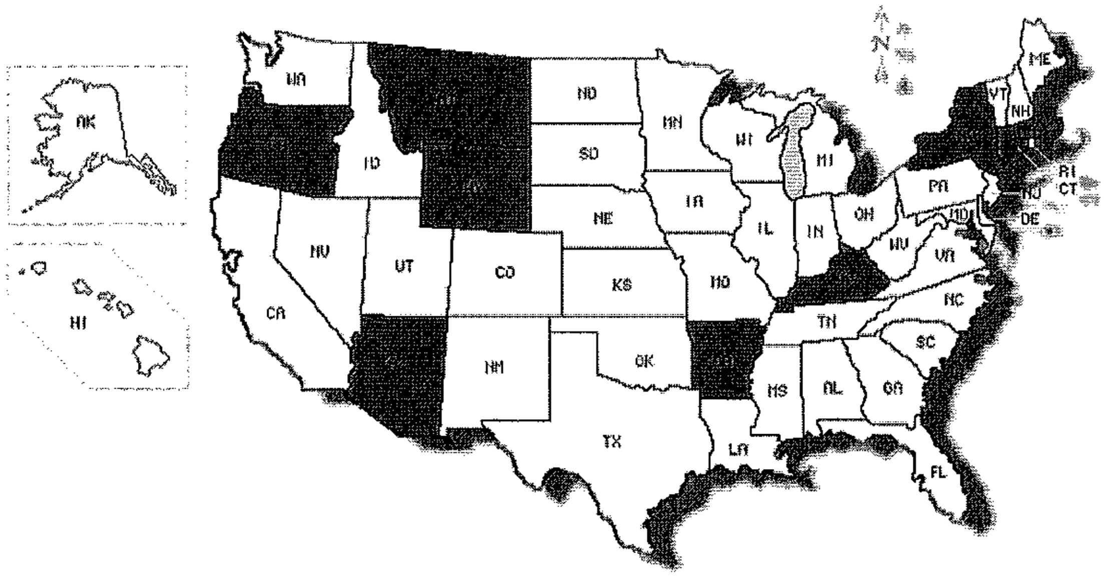
39 For example, in the Duke North Carolina Save-A-Watt programs, the LRAM for annual savings covered programs for the past 3 years and, although the EE measures were expected to last much longer, the revenue recovery was then truncated. Duke NC was allowed to collect the lost revenue on a contemporary basis with the program impacts, but this was set at 80% of the expected level of planned annual savings, which was meant to be conservative and result in little need to refund monies to the consumers.

40 North Carolina Utilities Commission, Duke Energy Carolinas, *Order Approving Agreement and Joint Stipulation of Settlement Subject to Certain Commission-Required Modifications and Decisions on Contested Issues*, Docket No. E-7, Sub 831, Feb. 9, 2010.

41 The Brattle Group © 2013 and NAWC.

Figure 4.5[42]: States with Lost Revenue Adjustment Mechanisms (LRAM) for Gas Companies



States with Lost Revenue Adjustment Mechanisms (LRAM) for Gas Companies
Arizona, Arkansas, Connecticut, Kentucky, Massachusetts, Montana, New York, Oregon, Wyoming

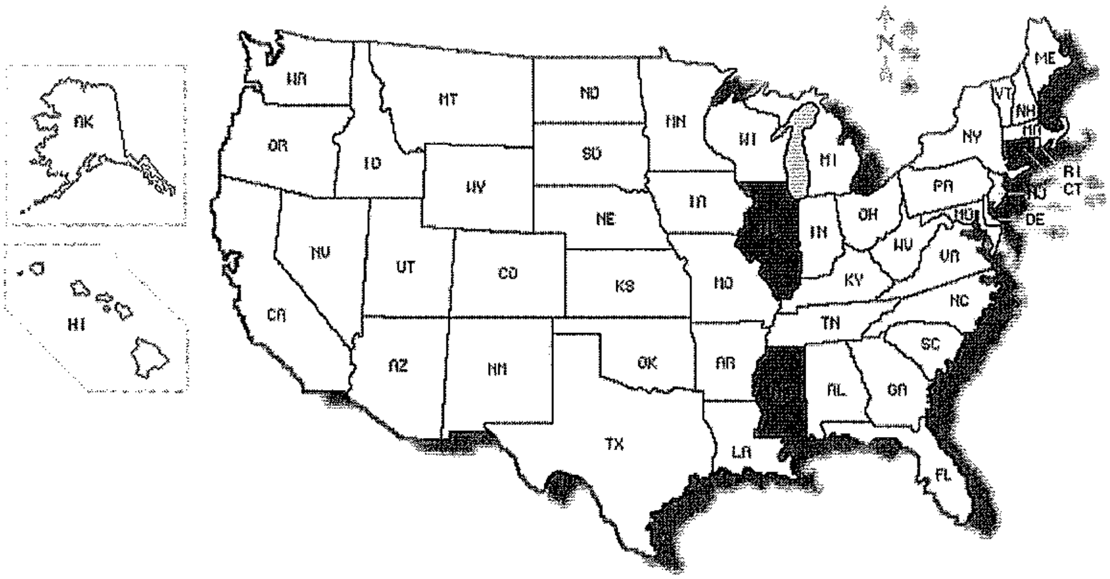
All states that were identified as having implemented some form of revenue stabilization for water utilities were identified in Table 4.3.

c. *Fixed Variable Rate Design.*

Fixed variable rate designs are another way to decouple base revenues from unit sales. The rates are set to recover all or a large proportion of the fixed costs, as established in the last general rate case, in the fixed charges. Straight fixed variable rates indicate that all fixed costs are in the customer charges. Under this kind of decoupling, the revenue targets between general rate cases will change proportional to the number of customers. The volumetric charges then recover largely or exclusively the variable costs.

42 The Brattle Group © 2013 and NAWC.

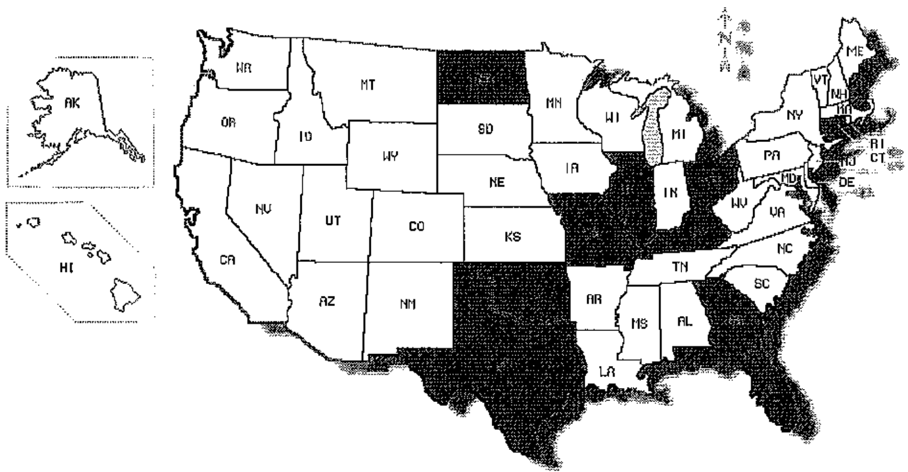
Figure 4.6[43]: States with Fixed Variable Rate Design for Electric Companies



States with Fixed Variable Rate Design for Electric Companies
Connecticut, Illinois, Mississippi

[43] The Brattle Group © 2013 and NAWC.

Figure 4.7[44]: States with Fixed Variable Rate Design for Gas Companies



States with Fixed Variable Rate Design for Gas Companies
Connecticut, Florida, Georgia, Illinois, Kentucky, Missouri, North Dakota, Ohio, Oklahoma, Texas

C. Comprehensive Alternative Ratemaking and Timely Recovery

Among the comprehensive alternatives we review that are used by the states are:

- Formula rates

[44] The Brattle Group © 2013 and, NAWC, and AGA, *Natural Gas Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms Current List*, Cynthia J. Marple, Sept. 2012.

- Multi-year rate mechanisms
- Earnings sharing and performance based rate making
- Future test year

For clarification, our count of states with a comprehensive alternative rate mechanism does not include the future test year states, which are treated as a separate category.

a. *Formula Rates*

The use of formula or formulaic rates and partially formulaic rates is common at both the state and federal level. Formula rates have many advantages including:

- The facilitation of prompt recovery of cost (both operating and capital expenditures)
- Avoiding frequent and costly rate filings
- More up-to-date reflection of actual costs in rates
- Reduction in regulatory risk

We note that Alabama, Georgia, Illinois, Louisiana, Oklahoma, South Carolina, and Texas have utilities that operate under formula rates. Several electric utilities in Alabama operate under a so-called Rate Stabilization and Equalization (RSE) mechanism, which has been used since 1982. Every year, the utility submits to the Alabama PSC a projected cost and expected ROE figure. If the projected ROE is less than or greater than the equity return range provided for under the rate, a corresponding increase or decrease is made in the RSE Factor to bring the ROE back to the midpoint of the approved return range. The benefits of the mechanism is that the PSC reviews costs annually instead of just during rate cases and that the rate impact of any changes in costs are recognized early and results in less rate impact than under traditional cost of service regulation.[45] In addition, there are examples of formulaic approaches to specific aspects of rate making. For example, Massachusetts Department of Public Utilities allows (but does not require) water utilities to use a formulaic approach to determine the allowed ROE.

Importantly, the National Association of Regulatory Utility Commissioners recently found the use of formulaic approaches to the determination of cost of equity for small water utilities to be a best practice.[46]

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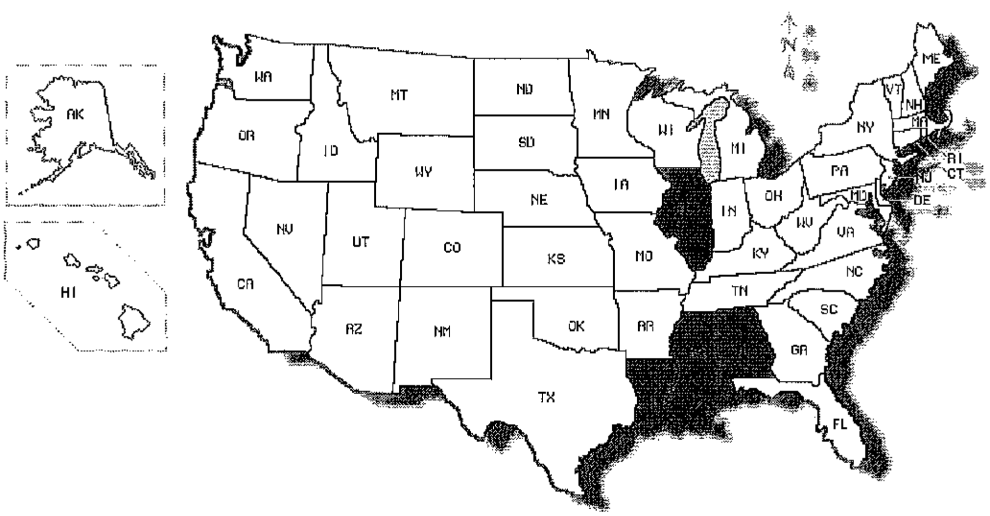
[45] For additional details on the mechanism, see *Edison Electric Institute*, "Case Study of Alabama Rate Stabilization and Equalization Mechanism," June 2011.

[46] Board of Directors, *National Association of Regulatory Utility Commissioners*, "WA-2 Resolution Supporting the Consideration of Regulatory Mechanisms and Policies Deemed "Best Practices" for the Regulation of Small Water Systems," July 24, 2013.

At the federal level, the FERC uses formula rate for "upward 75% of the more than 130 public utility transmission owners across the country."[47] In FERC jurisdiction the formula rather than the rates is approved by the regulator. For example, the formula rates for transmission often specify the allowed return on equity, the capital structure (which could be based on either the actual capital structure or a hypothetical structure deemed more appropriate for rate setting purposes), and the uniform system of accounts cost categories that can be recovered. The formula may specify that costs included in accounts such as fuel and purchased power costs, specific operating & maintenance costs, depreciation, allowed ROE, taxes, *etc.* with a deduction of tax credits can be recovered.[48] We note that for this approach to work, it is necessary that the utility and regulator have a well-defined regulatory accounting system that can be used in updating the formula rates.

Figure 4.8[49]: States Allowing Formula Rates for Electric Companies



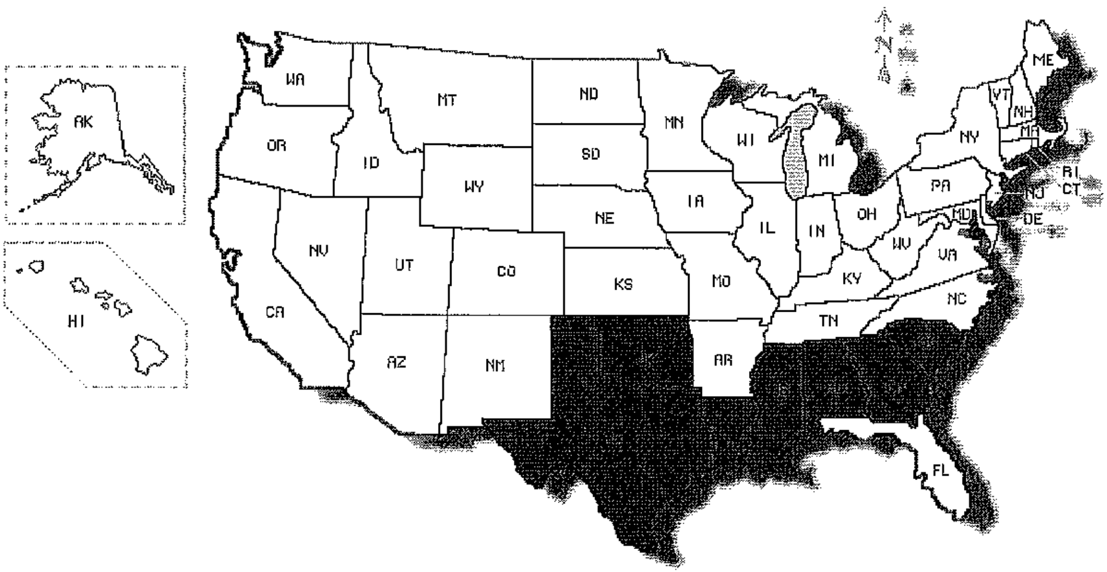
States Allowing Formula Rates for Electric Companies
Alabama, Illinois, Louisiana, Mississippi

47 Commissioner John R. Norris Statement, May 16, 2013, Docket No. EL 12-35-000, Item No. E-7.

48 For an example, see, Wisconsin Electric Power Company, Formula Rate Wholesale, FERC Electric Tariff Volume 9.

49 The Brattle Group © 2013 and NAWC.

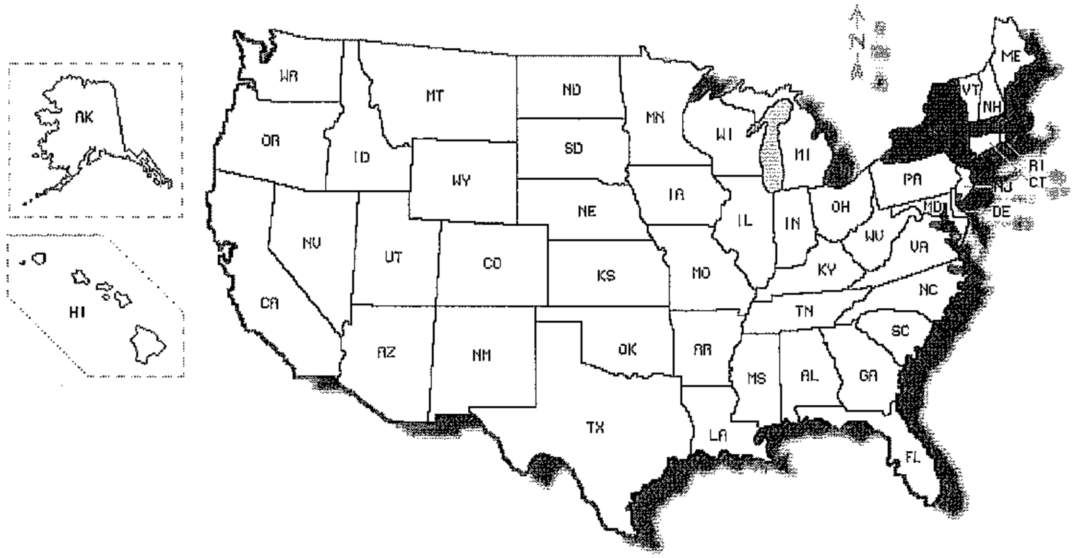
Figure 4.9[50]: States Allowing Formula Rate Making for Gas Companies



States Allowing Formula Rates for Gas Companies
Alabama, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, Texas

50 The Brattle Group © 2013 and NAWC.

Figure 4.10[51]: States Allowing Formula Rate Making for Water Companies



States Allowing Formula Rates for Water Companies
Massachusetts, New York

b. *Multi-Year Rate Approach*

Reliance on multi-year rate approach is not at all wide-spread in the U.S. although they are common outside the U.S.[52] However, the states indicated in the three Figures 4.11, 4.12, and 4.13 below, for electric, gas delivery, and water, respectively, have allowed a multi-year rate approach. The fact that a state has allowed a multi-year approach does not necessarily mean that the approach is commonly used in either industry.

A multi-year rate mechanism combined with, for example, an indexation to an inflation measure can be a powerful mechanism to recover incurred cost and at the same time avoid costly and time consuming rate cases.

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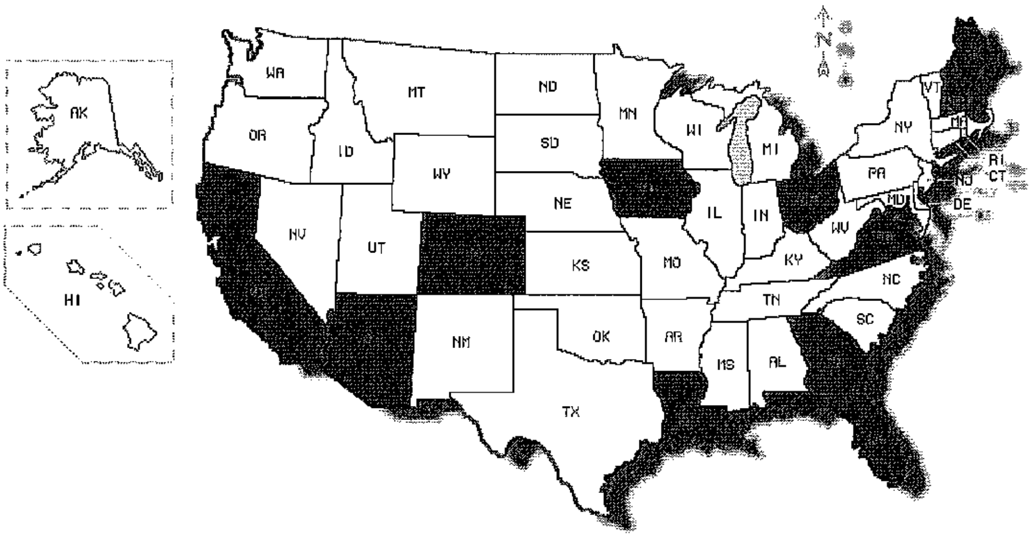
51 The Brattle Group © 2013 and NAWC.

52 For example, the U.K. regulator has recently gone to an 8-year rate period. The regulator uses a revenue cap form of regulation.

Figure 4.11: States that Allow Multi-Year Rate Mechanisms for Electric Companies[53]



States that Allow Multi-Year Rate Mechanisms For Electric Companies
Arizona, California, Colorado, Florida, Georgia, Iowa, Louisiana, Maine, New Hampshire, Ohio, Virginia

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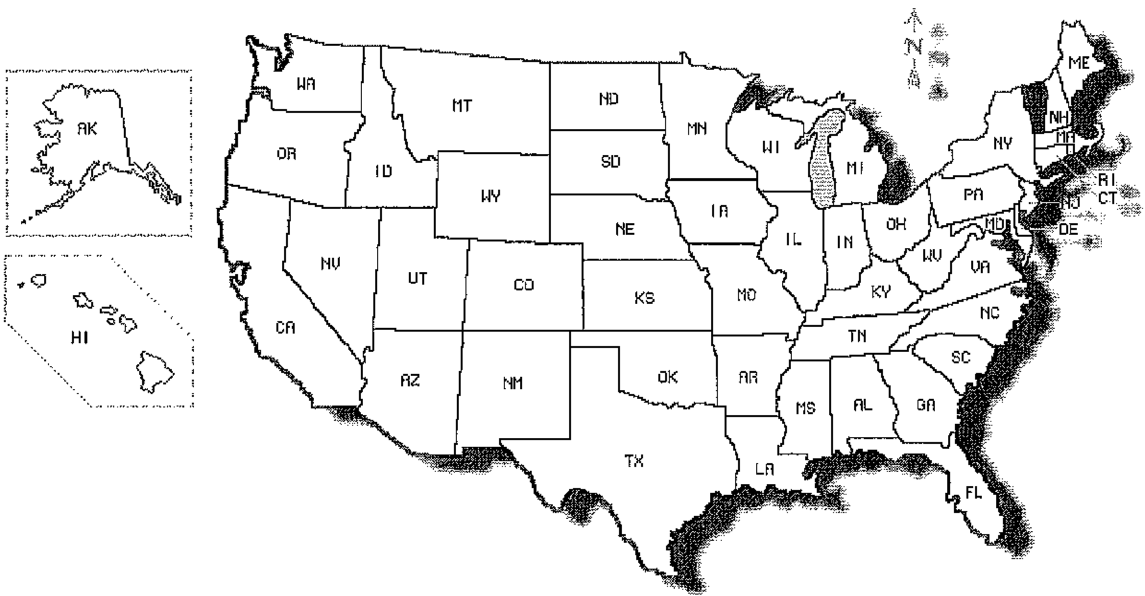
53 The Brattle Group © 2013 and NAWC.

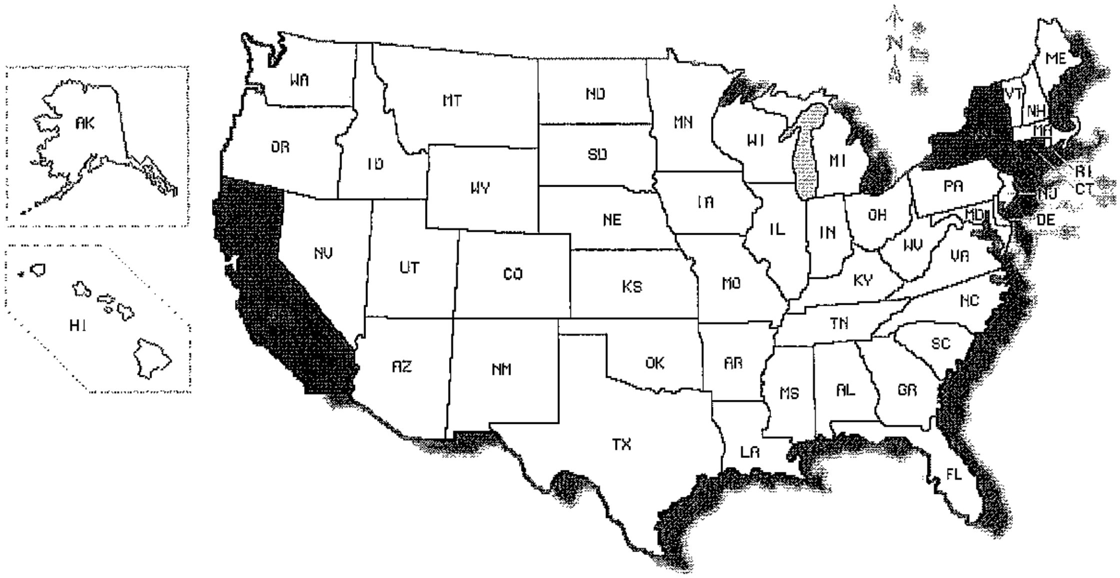
Figure 4.12: States that Allow Multi-Year Rate Mechanisms for Gas Companies[54]



States that Allow Multi-Year Rate Mechanisms For Gas Companies
Vermont

[54] The Brattle Group © 2013 and NAWC.

Figure 4.13: States that Allow Multi-Year Rate Mechanisms for Water Companies[55]



States that Allow Multi-Year Rate Mechanisms For Water Companies
California, Connecticut, New York

A multi-year rate mechanism can be advantageous for both the utility and consumers as it provides certainty to rates and avoids frequent and costly rate cases. A recent example of an electric multi-year rate mechanism is Xcel's settlement in Colorado, where the utility entered into a three-year mechanism in 2012. Specifically, the mechanism involved a phased-in rate increase, leaves riders for fuel and purchased power in place, includes an earnings' test and an agreement on no rate cases before 2015.

The multi-year settlement in Colorado has some common characteristics of multi-year deals such as the option to change rates if specific production costs change (*e.g.*, fuel) and a provision that should earnings exceed a pre-specified amount, then refunds needs to be made.

55 The Brattle Group © 2013 and NAWC.

c. *Earnings Sharing and Performance-Based Rate Making*

Traditionally, performance-based rate making is a mechanism that provides utilities with incentives to increase their efficiency. However, "in practice, incentive regulation is more a complement to than a substitute for traditional approaches to regulating legal monopolies."[56] In its simplest form, performance-based rates are determined as:

$$P_t = P_{t-1} \times (1 + (I - X))$$

where

P_t = price in current year t
P_{t-1} = price in prior year, t-1
I = inflation factor
X = productivity factor

The basic formula above is used in, for example, the U.K., where the initial price, P_0, is determined using a cost of service approach and reset every 8'th year using forecasted rate base and costs.[57] However, performance-based rate making has declined in popularity in the U.S.[58] and is currently mostly used as part of a rate making process. For example, some jurisdictions have targeted incentives for, for example:

- Procurement costs (fuel, purchased power, water)
- Plant operations (plant availability and efficiency)
- "External" system costs (losses, congestion, ancillary services)
- Infrastructure investments (mains replacement, transmission, renewables, cost control)
- Non-cost goals: reliability, service quality, end-use conservation.

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[56] Paul L. Joskow, "Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks," MIT and NBER Working Paper, August 2007 with edits March 2013, p. 65.

[57] The U.K. has extensive experience with performance-based rate making and currently allows utilities to choose from a menu of performance options that have a varying degree of incentives and risks build in. The intention is for each utility to choose a mechanism that (1) fit the utility's profile (*e.g.*, need for infrastructure investments and (2) avoids the utility games the system. For example, if a utility files for rates involving a large capital expenditure, but it does not invest in infrastructure, there is a true-up mechanism that takes back any additional revenue with interest.

[58] For example, while 16 states had some form of broad-based performance-based rates in 2000, the figure had dropped to 5 by 2007. See, for example, Toby Brown, Paul Carpenter, and Johannes Pfeifenberger, "Incentive Regulation: Lessons from other Jurisdictions," AUC PBR Workshop, May 2010.

Many of the prevailing performance-based mechanisms involve earnings sharing. Typically, the annual earnings (realized income) is compared to the allowed ROE[59] above (or sometimes below) a certain "dead band" range. A portion of any over or under earning may be shared with customers although not necessarily symmetrically.

The advantages of combining performance-based rates with earnings sharing are that it ensures results in any one year do not deviate substantially from the targeted rate and customers benefit immediately from any over earnings, while the utility is protected against substantial under earning. However, the disadvantages are that the implementation requires detailed reporting and monitoring, while at the same time it may attenuate the efficiency of the incentives associated with the performance-based plan in the first place.

In the U.S., broad performance-based rate mechanisms are limited, but a number of states incorporate aspects of performance-based rates in their rate making. For example, Mississippi Power and Alabama Power in Mississippi and Alabama, respectively, operate under a form of performance-based rate plan. For example, the Mississippi Performance Evaluation Plan (PEP) determines Mississippi Power's rates using a formulaic approach and then evaluates the utility's performance based on customer price, customer satisfaction, and reliability. The plan does have adjustments for major capital expenditures and natural disasters.[60] Similarly, the Missouri PSC has approved performance incentives for demand-side programs based on an "after-the-fact" verification that the 3-year energy saving program worked.[61]

Figure 4.14 and 4.15 below shows states that have some form for performance-based rate making and states that have some form of earnings sharing, respectively.

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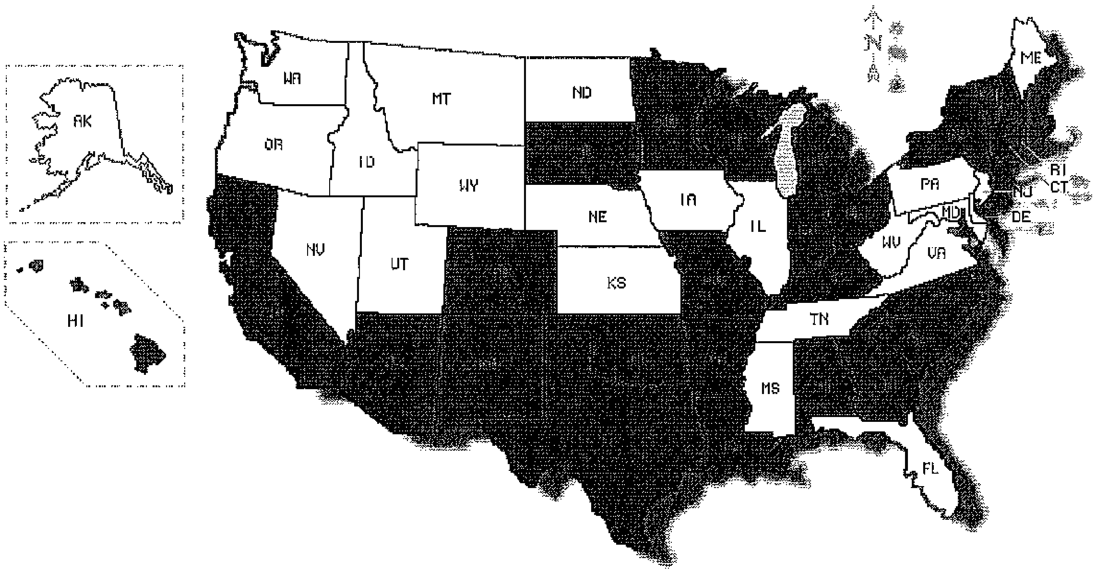
59 Ohio's excessive earnings test also compares the annual earnings of the state's electric utilities to those of "publicly traded companies, including utilities, which face comparable business and financial risk ..." See, Ohio Statutes, Chapter 4829.

60 Mississippi Power, "Performance Evaluation Plan."

61 Case No. ER-2012-0175.

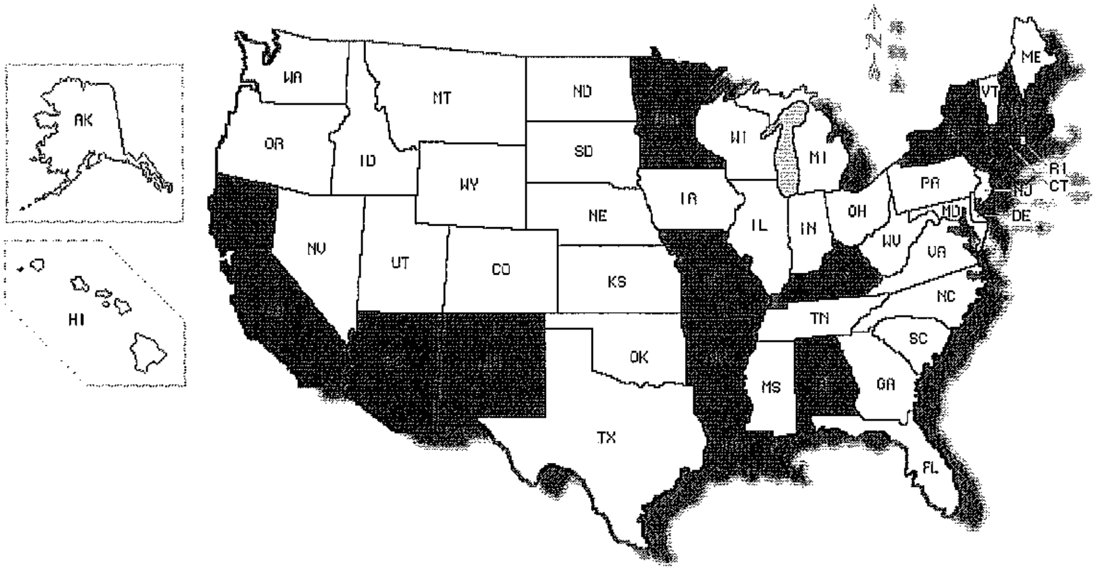
Figure 4.14: States Allowing Performance Based Measures or Earning Sharing for Electric Companies[62]



States Allowing Performance Based Measures or Earning Sharing for Electric Companies
Alabama, Arkansas, Arizona, California, Colorado, Connecticut, District of Columbia, Georgia, Hawaii, Indiana, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, North Carolina, New Hampshire, New Mexico, New York, Ohio, Oklahoma, Rhode Island, South Carolina, South Dakota, Texas, Vermont, Wisconsin

62 The Brattle Group © 2013 and *State Electric Efficiency Regulatory Frameworks*, IEE Report July 2013.

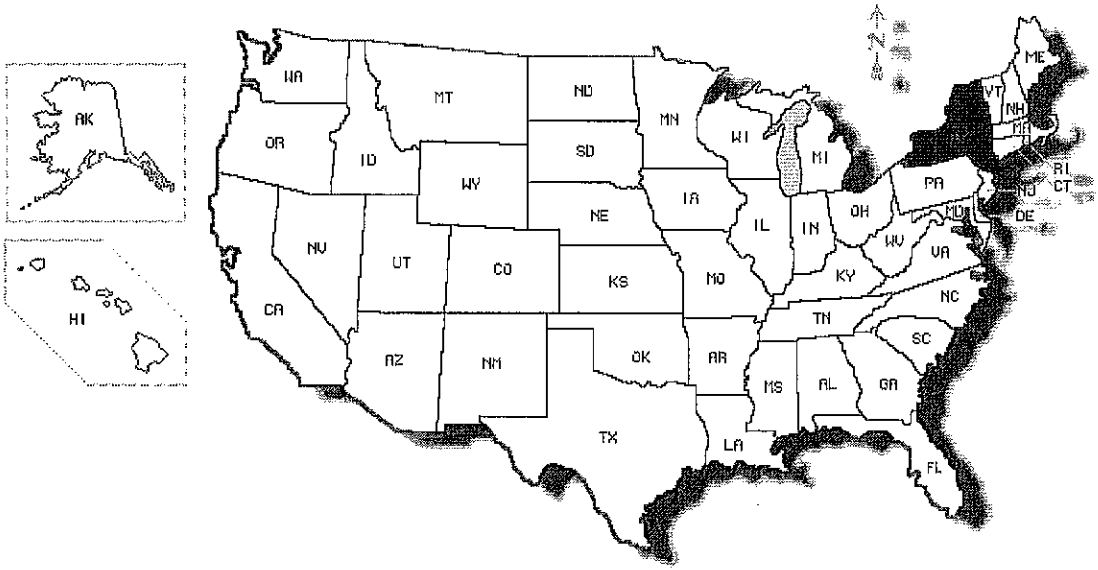
Figure 4.15: States Allowing Performance Based Measures or Earning Sharing for Gas Companies[63]



States Allowing Performance Based Measures or Earning Sharing for Gas Companies
Alabama, Arkansas, Arizona, California, Connecticut, Kentucky, Louisiana, Massachusetts, Minnesota, Missouri, New Hampshire, New Mexico, New York

63 The Brattle Group © 2013 and *State Electric Efficiency Regulatory Frameworks*, IEE Report July 2013.

Figure 4.16: State Allowing Earning Sharing for Water Companies[64]



State Allowing Earning Sharing for Water Companies
New York

There are no water utilities we know off that have performance-based measures in place.

Importantly, many of the states shown in Figure 4.14 and 4.15 have performance measures related to conservation or other specific targets, so that the use of performance-based measures is only partial. Our survey indicates that only New York has implemented earnings sharing for a water utility.

Earnings sharing (with a dead band) is a common form of earnings sharing for electric utilities.

d. Future Test Year and Other Timely Recovery Mechanisms

While the future test year is not as comprehensive a rate making mechanism as the mechanisms discussed above, we cover it here. It is one of the longest running mechanisms for recovery of costs and capital expenditures that are expected to occur during the first year of new rates. The

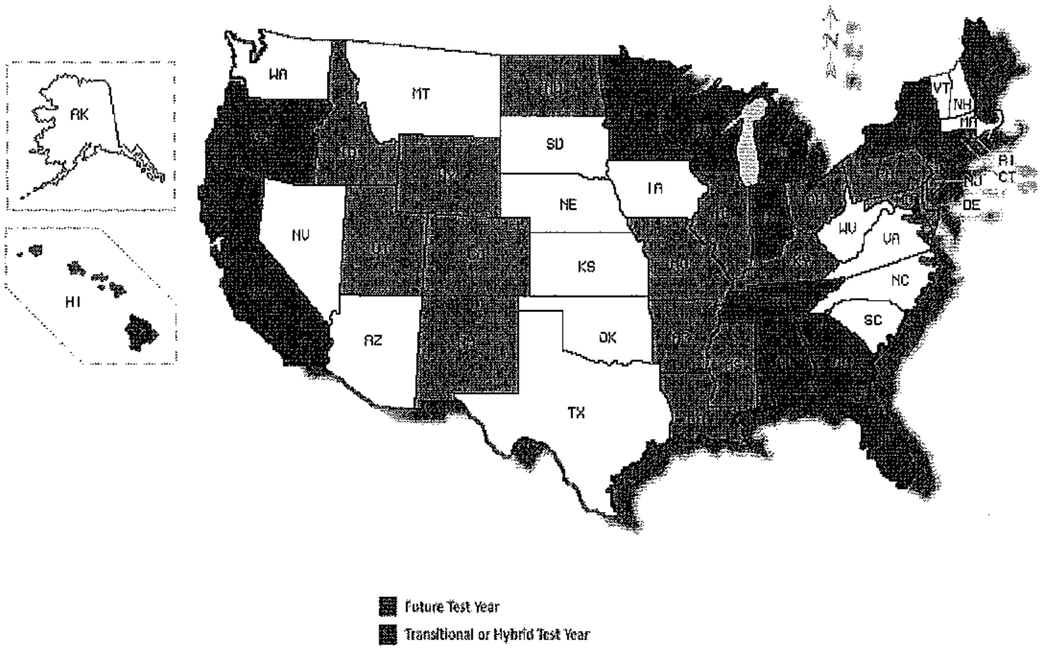
64 The Brattle Group © 2013 and *State Electric Efficiency Regulatory Frameworks*, IEE Report July 2013.

future test year became popular when the U.S. inflation was relatively high, but today the growth in rate base and increasing costs associated with conservation, consumer service, *etc.* are more important factors than inflation. A future test help utilities recover costs and capital expenditures in a timely fashion as expected infrastructure investments and / or costs are recovered through revenue. This is especially important for utilities that have large infrastructure investments, are expanding their services (and hence costs), and / or during times of inflation. A future test year has become more common in recent years and empirical studies have found that electric utilities that operate under a future test year regime generally have better credit ratings and are better able to earn their allowed ROE than those that use a historic test year.[65] (Note, at least IL and MI have generic rules that allow all utilities to file future test year.

The following Figure 4.17 shows the states that use a future or partially forward test year for electric and natural gas. Figure 4.18 shows states with future test year for water utilities.

65 Mark A. Lowry, David Hovde, Lullit Getachew, and Matt Makos "Forward Test Years for US Electric Utilities," Edison Electric Institute, August 2010, Chapter 3.

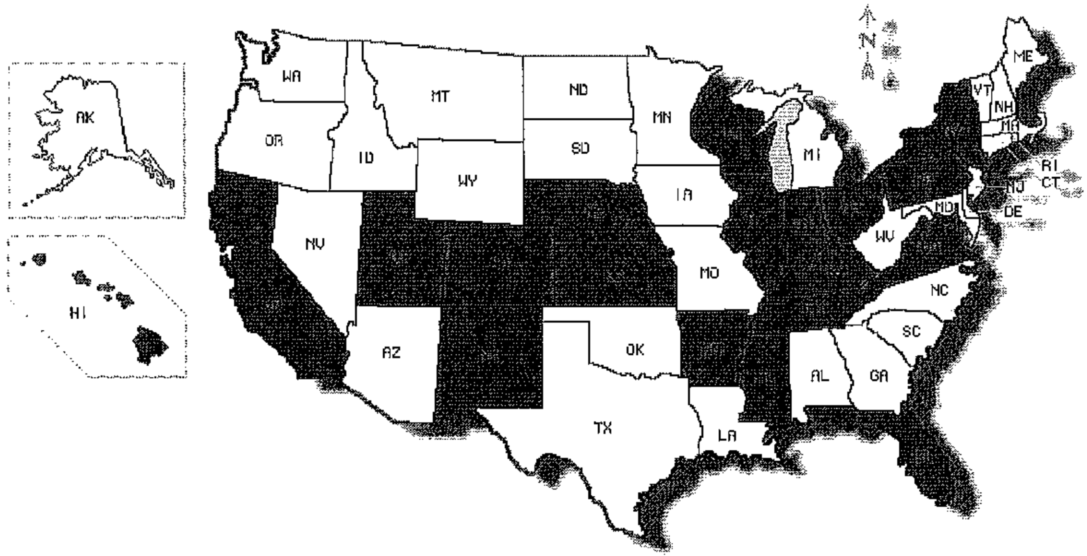
Figure 4.17[66]: States with Future Test Years for Electric and Gas Companies



States Allowing Future Test Year for Electric and Gas Companies	States Allowing Hybrid or Transitional Future Test Year for Electric and Gas Companies
Alabama, California, Connecticut, Florida, Georgia, Hawaii, Indiana, Maine, Michigan, Minnesota, New York, Oregon, Rhode Island, Tennessee, Wisconsin	Arkansas, Colorado, Delaware, District of Columbia, Idaho, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, New Jersey, New Mexico, North Dakota, Ohio, Pennsylvania, Utah, Wyoming

66 The Brattle Group © 2013 and EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Prepared by: Pacific Economics Group Research LLC, January 2013. This source addressed electric and gas companies together and did not differentiate by industry.

Figure 4.18[67]: States with Future Test Years for Water Companies



States Allowing Future Test Year for Water Companies
Arkansas, California, Colorado, Florida, Hawaii, Illinois, Indiana, Kansas, Kentucky, Mississippi, Nebraska, New Mexico, New York, Ohio, Pennsylvania, Tennessee, Utah, Virginia, Wisconsin

As can be seen from Figure 4.17 and 4.18 above, there are a considerable number of states that rely on a future test year. In addition, many states use a hybrid or transitional test year for electric and natural gas utilities, respectively. Thus, a large group of states are including some forward looking measures in rates.

D. Alternative Ratemaking of Capital Expenditures

This is a diverse group of policies that address the issues by focusing on more specific costs, and frequently on capital expenditures and their recovery over time. The methods are:

- Capex Riders and Distribution System Improvement Charges (DSIC)
- Other Riders and Trackers.
- Construction Work in Progress (CWIP)

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67 The Brattle Group © 2013 and EEI, *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Prepared by: Pacific Economics Group Research LLC, January 2013.

They are discussed in order. However, we note that we provide just a few examples of Other Riders and Trackers that address regulatory lag issues. We have discussed above why the host of riders, trackers, and balancing accounts for operating expenses were not surveyed, because of their very large numbers and because the focus of this report is on future capital requirements of the water industry. In general, our count of states with a Capex rider, DSIC mechanism, or a CWIP policy does not include states with Other Riders and Trackers, which are highly numerous, diverse, and state or utility specific.

a. *Capex Riders or DSIC*

As noted above, the electric, natural gas, and water industry are very capital intensive and all three require significant maintenance of the distribution system. Therefore, timely recovery of such investments is important to maintain a solid financial performance and attract capital.

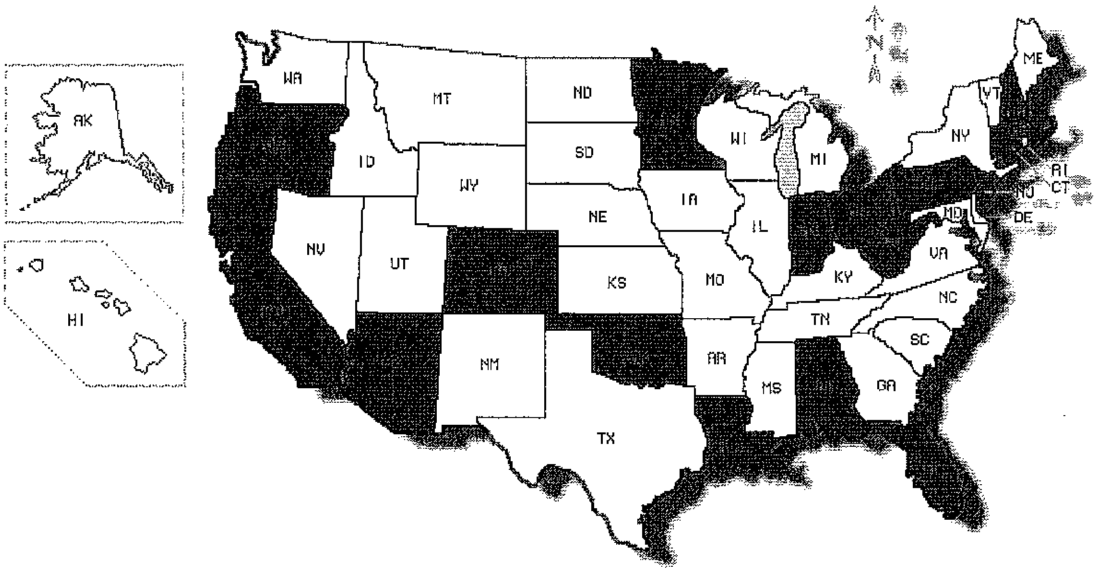
Capital expenditure or "capex" riders are for the recovery of specific investment expenditures. Their calculation is more complex and accomplished through formulas that encompass the amortization, the allowed profit and the income taxes due, in parallel to the treatment of capital recovery in a GRC. A common name for this ratemaking policy in the water industry is the Distribution System Improvement Charge or DSIC. Looking forward, capex riders can be important because a large amount of capital investment is needed by these three types of regulated utilities and the regulatory lag in the GRC policies. The electric, natural gas and water industries have a variety of needs, such as:

- Digital technologies for distribution system reliability, which for electrics include the ability to include distributed generation and micro grids
- Smart meters and advanced meter infrastructure roll-out
- Transmission expansion for renewable development, pipeline build-out for natural gas, and main, dams, *etc.* for water
- Environmental improvements at power plants and water, safety improvements for natural gas.

Without capex riders, a utility with an historic test year sees growing investment as meaning a compression in the schedule of general rate cases, while significant investments accumulate as the GRC is conducted. With very little natural growth in billing determinants experienced in the past five years and some question about whether it will return, revenue insufficiency is much more likely to affect the utility financial stability.

Capex riders allow utilities to make investments deemed necessary by the Commission when the capex rider is set up. Allowable investments are those in a formal plan periodically approved by The Commission. Caps on the percentage increase of base rates from the capex rider in a period limit the investment undertaken. Figure 4.21 below shows the states that allow water companies to use DSIC ratemaking.

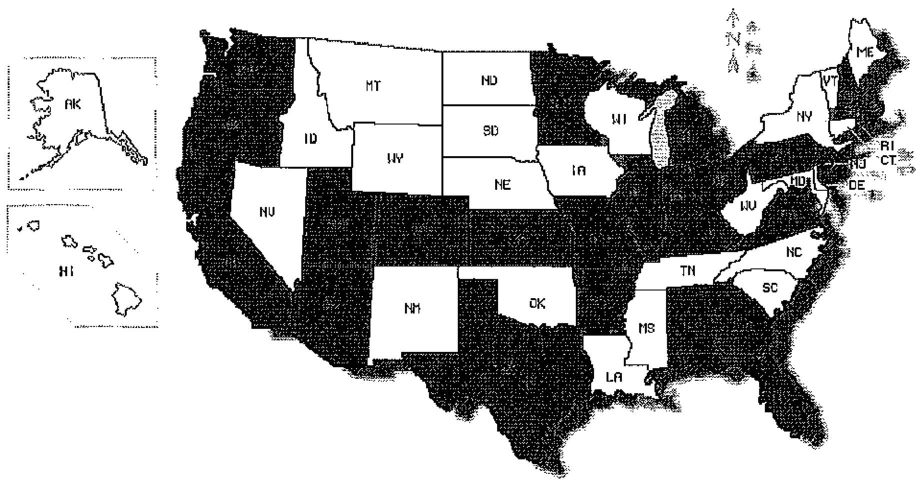
Figure 4.19: States Allowing Capital Expenditure (Capex) Riders for Electric Companies[68]



States Allowing Capital Expenditure (Capex) Riders for Electric Companies
Alabama, Arizona, California, Colorado, Connecticut, Florida, Indiana, Louisiana, Massachusetts, Minnesota, New Hampshire, New Jersey, Ohio, Oklahoma, Oregon, Pennsylvania, West Virginia

68 Data sources: The Brattle Group © 2013 and NAWC

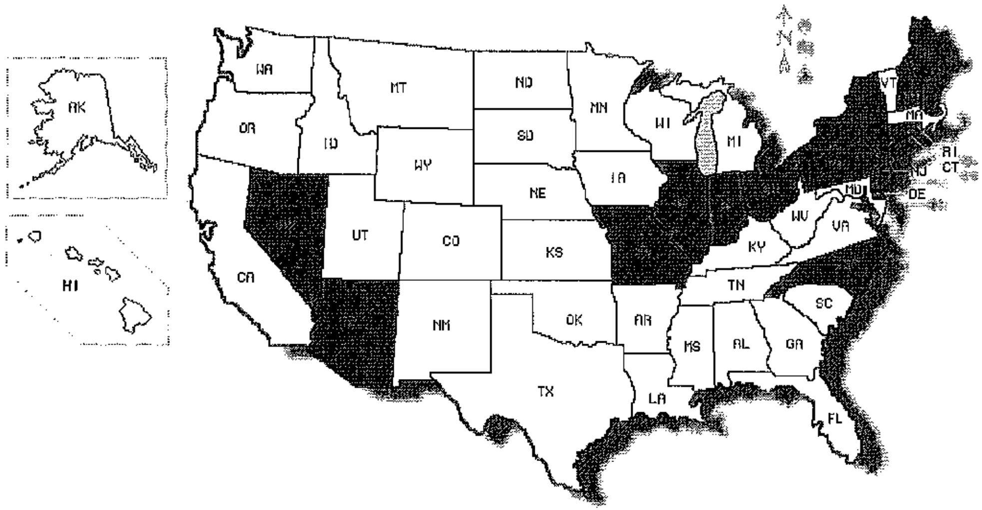
Figure 4.20: States Allowing Capital Expenditure (Capex) Riders for Gas Companies[69]



States Allowing Capital Expenditure (Capex) Riders for Gas Companies
Alabama, Arkansas, Arizona, California, Colorado, Florida, Georgia, Indiana, Illinois, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, Ohio, Oregon, Pennsylvania, Rhode Island, Texas, Utah, Washington, Virginia

69 Data sources: The Brattle Group © 2013, NAWC, and AGA, *Natural Gas Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms Current List*, Cynthia J. Marple, Sept. 2012.

Figure 4.21: States Allowing Distribution System Improvement Charges (DSIC) for Water Companies[70]



States Allowing DSIC for Water Companies
Arizona, Connecticut, Delaware, Illinois, Indiana, Maine, Missouri, North Carolina, Nevada, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island

b. Other Riders and Trackers

In addition to the mechanisms discussed above there are a host of so-called riders, trackers and balancing accounts that allow the actual expenditures for certain specific costs to be recorded and compared to the level collected in the rates from separate charge factors. Differences both positive and negative are returned to the ratepayers or to the utility within a year or at the next rate case. Riders, trackers and balancing accounts are technical terms but this report will discuss them collectively.[71]

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70 Data sources: The Brattle Group © 2013 and NAWC.

71 While terminology varies across states, riders and balancing accounts are typically part of the tariffs posted by the utility and the tariff for each one governs how the costs differences are recovered by the

Continued on next page

Fuel clauses are used in almost all states that still have traditional, vertically-integrated electric utilities. In the modern electric and gas industries, there large, highly competitive regional power and natural gas markets that generally set prices transparently.

In the water industry, the cost of water is a natural equivalent to the fuel adjustment clause and is used in several states; especially where water procurement is more costly such as in the Southwestern part of the U.S. Further, as pumping water is a key operational activity in California and the associated power costs are larger, the California-based water utilities have a power cost adjustment clause. Similarly, as arsenic is a naturally occurring chemical in, for example, Arizona and needs to be removed to make drinking water safe, some Arizona water utilities have an arsenic removal cost recovery mechanism.

As discussed above, a general rate case takes months to prepare and then from six to twelve months to reach a decision on new base rates. With an historic test year, the only costs that fit are costs that rise slowly and are amenable to control without jeopardizing the provision of reliable service. Even with a future test year, the future of the power and the gas markets can hold major surprises. A common sense principle in regulation is that the utility should be primarily at risk for costs and performance factors it can control, and regulatory review should be focused on those costs.

Therefore, there are three typical motivations for riders:[72]

- The underlying cost is often large and quite volatile. Inevitable prediction errors could result in significant cash and earnings shortfalls for the utility if those costs are not recovered in a timely manner or unduly high cash burdens for customers when such costs happen to be lower than projected.
- Changes in the underlying cost is largely beyond the utility's control, since it reflects, for example, prices in the wholesale fuel and power markets that individual utilities must participate in. Furthermore, utilities earn no margin or return component on these expenses.
- Cost is allowed recovery outside a GRC of "pre-approved" cost items that change in predictable ways, such as the costs incurred in implementing an approved environmental compliance plan. These costs are not necessarily large.

Continued from previous page

appropriate entity. Trackers can be different when they are Commission-approved accounting entries that record past costs as uncollected balances, which are not written off. The amounts can be proposed for inclusion in base rate in the next general rate case.

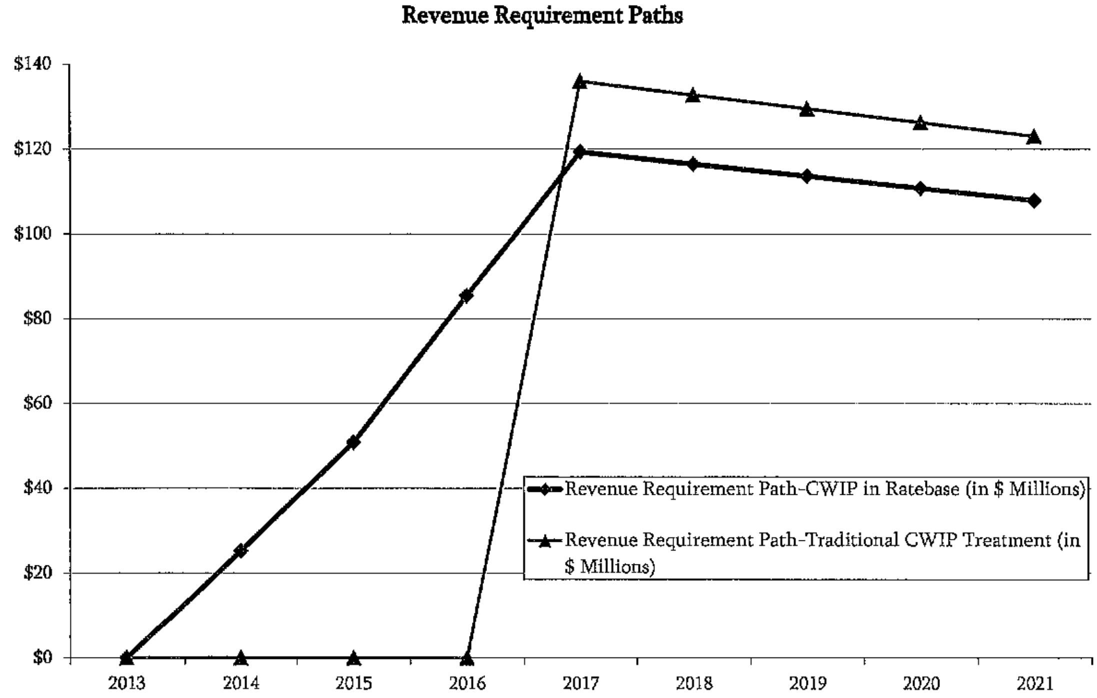
[72] Frank Graves, Philip Hanser, Greg Basheda, *Electric Utility Automatic Adjustment Clauses: Benefits and Design Considerations*, Prepared for: Edison Electric Institute, Prepared by The Brattle Group, November 2006.

c. *Construction Work in Progress (CWIP)*

As noted above the delay in recovery of costs and capital expenditures can cause significant pressure on the utility's financial metrics; including its credit metrics and rating. If the key issue causing a delay in recovery is infrastructure investments, the inclusion of Construction Work in Progress (CWIP) in the rate base, which allows for a return on these funds while construction is ongoing, can complement a future test year.

The traditional approach under cost of service regulation is to determine Allowance for Funds Used During Construction (AFUDC) as the accrual of the financing costs of construction in a deferral account. The account is normally capped when the plant goes into service, so there can be a substantial delay in both the return on the funds invested and the return of these funds. This is especially true if there is a delay before a general rate order allows it in rate base. The CWIP in rate base allows utilities to recover costs incurred from financing construction on a current basis. Regulatory approval is usually required for utilities to earn a return on the CWIP in rate base although it usually does not allow the utility to recover any portion of the asset. This is usually accomplished through periodic filings. CWIP requires earlier payments by the customers but lowers total customers' payments. Therefore, CWIP provides a more gradual rate increase and less rate shock. This is illustrated in Figure 4.22 below:

Figure 4.22: Illustration of How CWIP Lessens the Rate Shock of Large Capital Investments



Credit rating agencies are very interested in and will react to the manner in which different states and utilities increase cash flows to keep their financial metrics sound. CWIP does that because it provides for more timely cash flow to the utility than does AFUDC. Our survey results shows that 18 states support one or more of the forms of CWIP in rate base for electric companies[73]. There are 21 states that support CWIP for water companies. We know that several states have CWIP for gas delivery companies but we do not have sufficient data to report the number. CWIP in rate base is especially supportive of a utility's financial performance if it has a large, ongoing construction program and recognized as such by credit rating agencies.[74]

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[73] Data sources: The Brattle Group © 2013 and NAWC.

[74] For an example, see Fitch Ratings, "Fitch Rates Duke Energy Indiana First Mortgage Bonds 'A'," July 9, 2013.

V. Conclusion

Over the next quarter century, the U.S. water industry faces a set of critical infrastructure investment needs that is expected to total between $335 billion to $1 trillion. This is to replace aging infrastructure and make investment needed to maintain water quality. In addition, the EPA estimates that after years of drought, up to 70% of the states face some form of water shortage and this will increase costs of water and perhaps require separate investments.

This report provides a survey of policies that state regulators across the U.S. have developed to meet these challenges by improving traditional cost of service ratemaking (COSR) in the water, electric, and natural gas distribution industries. The traditional COSR has been in place for at least half a century. The future viability of the water industry needs effective and efficient regulatory policy that puts private capital to work meeting a substantial share of the future infrastructure needs. The cost of the large future infrastructure investments will be viewed by financial markets in terms of their risk. First, this will depend of water utilities' knowledge and ability to choose the right investments in technology. Second, the risk also depends on whether the public policies allow recovery of prudent cost of investment once they are incurred. Third, the ability to attract capital depends on the available rate of return relative to investments of similar risk.

Growth rates in sales of water, electricity, and natural gas for residential and commercial customers have fallen and in some places have been eliminated. The lack of growth is good for the societal goals of water conservation / efficiency and global climate change, but it makes earning the allowed rate of return on investment more difficult by removing a source of funds for future investments. It is therefore imperative that alternative ratemaking mechanisms be developed that meet the challenges of the water industry going forward.

This report focuses on three kinds of alternative policies that meet challenges of improving traditional cost of service ratemaking. Currently, the electric and natural gas industries each have some form of conservation adjustment, decoupling or revenue stabilization in over half the states. The use of such mechanisms is much less widespread in the water industry, where the survey identified fewer than a half dozen states as having some form of conservation, decoupling, or revenue stabilization policy.

Similarly, it appears that currently some form of comprehensive alternative regulation is more widely used for electric or gas utilities than for water utilities, when considering mechanism such as formula rates, earnings sharing, performance based rate making or multi-year rates.

The report also looked to the ability to recover capital expenditures in a timely fashion through Capex riders or DSICs. This appears to be an area where legislators and regulators currently are improving utilities' ability to recover capital expenditures timely with several states recently passed legislation aiming at early recovery for certain infrastructure investments.[75] While the methods vary greatly across jurisdictions, the recently passed legislation includes all three utility industries.

Appendix C at the end of this report summarizes the use of alternative regulatory mechanisms as well as other ratemaking methods for the water industry by state.

75 See, for example, Indiana Legislature SB 560.

Appendix A
Tabulation of the Alternative Regulatory and Rate Approaches in the Three Infrastructure Industries
DRAFT

Figure A.1 Alternative Regulatory Ratemaking for Electric Companies

Electric Companies		
Broad ARR Categories in Gray with Specific ARRs Listed Below		
Category	**Count of States Allowing for ARR's**	**List of States Allowing for ARR's**
CWIP or Capex Riders		
Total States with CWIP or Capex Riders	**28**	**AL, AZ, CA, CO, CT, FL, GA, IN, KS, LA, MA, MN, NC, ND, NH, NJ, NM, OH, OK, OR, PA, SC, SD, TX, VA, WI, WV, WY**
Environmental Capital Expenditures	6	AZ, FL, IN, LA, OH, WV
Other Capital Expenditures (Includes Transmission Capital Costs Recovery)	13	AL, CA, CO, CT, LA, MA, MN, NH, NJ, OH, OK, OR, PA
CWIP	19	CO, GA, IN, KS, LA, MI, MN, NM, NC, ND, OH, OK, SC, SD, TX, VA, WI, WV, WY
Decoupling and Revenue Adjustment Mechanisms		
Total States with Decoupling and Revenue Adjustment Mechanisms	**27**	**AR, AZ, CA, CT, DC, HI, ID, IL, IN, KS, KY, LA, MA, MD, MS, MT, NC, NH, NV, NY, OH, OK, OR, RI, SC, WI, WY**
True Up Decoupling	12	CA, CT, DC, HI, ID, MD, MA, NY, OH, OR, RI, WI
Fixed Variable Rate Design	3	CT, IL, MS
Lost Revenue Adjustment Mechanism (LRAM) for EE and DSM	17	AR, AZ, IN, KS, KY, LA, MA, MT, NV, NH, NY, NC, OH, OK, OR, SC, WY
Comprehensive Alternative Regulation and Ratemaking		
Total States with Comprehensive Alternative Regulation and Ratemaking	**34**	**AR, AZ, AL, CA, CO, CT, DC, FL, GA, HI, IA, IL, IN, KY, LA, MA, ME, MI, MN, MO, MS, NC, NH, NM, NY, OH, OK, RI, SC, SD, TX, VA, VT, WI**
Formula Rates	4	AL, IL, LA, MS
Multi-Year Rate	11	AZ, CA, CO, FL, GA, IA, LA, ME, NH, OH, VA
Performance-Based Rate Making (PBR) or Earnings Sharing	28	AL, AR, AZ, CA, CO, CT, DC, GA, HI, IN, KY, LA, MA, MI, MN, MO, NC, NH, NM, NY, OH, OK, RI, SC, SD, TX, VT, WI

Figure A.2: Alternative Regulatory Ratemaking for Gas Companies

Gas Companies		
Broad ARR Categories in Gray with Specific ARRs Listed Below		
Category	**Count of States Allowing for ARR's**	**List of States Allowing for ARR's**
CWIP or Capex Riders		
Total States with CWIP or Capex Riders	**28**	**AL, AR, AZ, CA, CO, FL, GA, IN, IL, KS, KY, MA, MI, MN, MO, NH, NJ, OH, OR, PA, RI, SC, TX, UT, VA, WA, WI, WY**
Other Capital Expenditures (Includes Transmission Capital Costs Recovery)	25	AL, AR, AZ, CA, CO, FL, GA, IN, IL, KS, KY, MA, MI, MN, MO, NH, NJ, OH, OR, PA, RI, TX, UT, WA, VA
CWIP	3	SC, WI, WY
Decoupling and Revenue Adjustment Mechanisms		
Total States with Decoupling and Revenue Adjustment Mechanisms	**31**	**AR, AZ, CA, CT, FL, GA, IL, IN, KY, MA, MD, MI, MN, MO, MT, NC, ND, NJ, NV, NY, OH, OK, OR, RI, TN, TX, UT, VA, WA, WI, WY**
True Up Decoupling	22	AR, AZ,CA,GA, IL, IN, MA, MD, MI, MN, NC, NJ, NV, NY, OR, RI, TN, UT, WA, WI, WY, VA
Fixed Variable Rate Design	10	CT, FL, GA, KY, IL, MO, ND, OH, OK, TX
Lost Revenue Adjustment Mechanism (LRAM) for EE and DSM	9	AR, AZ, CT, KY, MA, MT, NY, OR, WY
Comprehensive Alternative Regulation and Ratemaking		
Total States with Comprehensive Alternative Regulation and Ratemaking	**18**	**AL, AR, AZ, CA, CT, KY, GA, LA, MA, MO, MN, MS, NH, NM, NY, OK , SC, TX, VT**
Formula Rates	7	AL, GA, LA, MS, OK , SC, TX
Multi-Year Rate	1	VT
Performance-Based Rate Making (PBR) or Earnings Sharing	13	AL, AR, AZ, CA, CT, KY, LA, MA, MN, MO, NH, NM, NY

Figure A.3 Alternative Regulatory Ratemaking for Water Companies

Water Companies		
Broad ARR Categories in Gray with Specific ARRs Listed Below		
Category	Count of States Allowing for ARR's	List of States Allowing for ARR's
CWIP, DSIC, and Capex Riders		
Total States with CWIP or Capex Riders	**31**	**AR, AZ, CO, CT, DE, FL, HI, IL, IN, KY,MA, ME, MO, MT, NH, NJ, NM, NV, NY, NC, OH, OK, OR, PA, RI, SC, TN, TX, WA, WI, WV**
Construction Work in Progress (CWIP)	21	AR, CO, CT, DE, FL, HI, IL, KY, ME, NJ, NY, NC, OH, OK, OR, PA, SC, TN, TX, WV, WI
Capex Trackers and Distribution System Improvement Charges (DSIC)	15	AZ, CT, DE, IL, IN, ME, MO, NC, NV, NH, NJ, NY, OH, PA, RI
Conservation Adjustments, Decoupling, and Revenue Stabilization		
Total States with Conservation or Revenue Stabilization	**5**	**AZ, CA,CT,NV, NY**
General Decoupling with Periodic True-up	5	AZ, CA, CT, NV, NY
Lost Revenue Adjustment Mechanism	0	
Comprehensive Alternative Regulation and Ratemaking		
Total States with Comprehensive Alternative Regulatory Mechanisms	**4**	**CA, CT, MA, NY**
Formula Rates	2	MA, NY
Multi-year Rate Mechanisms	3	CA, CT, NY
Earnings Sharing and Performance Based Rate Making	1	NY

Note: Total Categories shown in gray include ARRs that fall within the broad category but do not fit the descriptions for the specific ARRs highlighted below.

Revenue Stabilization

Conservation Adjustments and General Decoupling with Periodic True-Up

Comprehensive and Timely Recovery

Formula Rates

Multiyear Rate Approach

Earnings Sharing and Performance Rate Making

Future Test Year and Other Timely Recovery Mechanisms

Alternative Ratemaking of Capital Expenditures

DSIC

Other Riders and Trackers

CWIP

Appendix B
Dockets and Orders Establishing Water ARRS by State

This appendix lists the source documents Brattle has acquired that document the ARRs for water utilities. The types of sources include:

- State statutes allowing a type of ARR for a general set of regulated water utilities
- Individual ARRs that are established in specific rate case or other regulatory proceedings for specific utilities.

The sources themselves are:

- National Association of Water Companies and its member companies
- The Brattle Group © 2013

This appendix does provide a good sample of ARRs established across the U.S. Additional information will be included in the final version of the report. The subsections under the three ARR categories are generally but not exactly the same as the body of the report.

1. Conservation Adjustments, Decoupling, and Revenue Stabilization

1.1 Conservation Adjustments and General Decoupling with Periodic True-up

Arizona

- Arizona Water Company- Monterey Water Revenue Adjustment Mechanism (Investigation 07-01-022, Decision 08-08-030 - Appendix A, Settlement, discussion beginning on page 5.)

California:

- Suburban Water Systems- Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Account (MCBA) (Decision 08-02-036)

New York:

- AWW New York - Revenue, Production Costs and Property Tax Reconciliation (RPCRC) Mechanisms which reconciles metered revenue, fuel, power, chemicals and property taxes per Case 11-W-0200 for Long Island American.
- UW New York- Decoupling.

Nevada:

- United Water New Rochelle Inc.- Decoupling (Bill 436).

1.2 Other Conservation and Revenue Stabilization Mechanisms

Arizona:

- EPCOR Arizona Water- Declining Usage Adjustment (Survey).

California:

- Golden State Water- Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Account (MCBA) (Source: DECISION ON THE 2011 Generic RATE CASE FOR GOLDEN STATE WATER COMPANY, Application 11-07-017, May 13, 2013.)
- Suburban Water Systems- Monterey Water Revenue Adjustment Mechanism (Source: Investigation 07-01-022, Decision 08-08-030 - Appendix A, Settlement, discussion beginning on page 5.)
- California American Water Company- Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Account (MCBA) (Decision 08-02-036).

Connecticut:

- State Statute - Revenue Adjustment Mechanism (PA 13-78).

2. Comprehensive Alternative Regulation and Ratemaking

2.1 Formula Rates

Massachusetts:

- Aquarian Water Company of Massachusetts- Optional formula for determining allowed rates of return on equity for water companies. ROE = 30-year T-bond + 3% if equity % between 25 and 75% and min ROE = 11.5%, max ROE = 14.5%, (200 CMR 31.00 (or D.P.U. 11-43, p. 217-219).

New York:

- UW New York- Formula Rate (from interview)

2.2 Multi-Year Rate Mechanisms

California:

- Golden State- Three year rate case cycle, with forward test year and two adjustments. Water has an earnings test, unlike electric and gas.

Connecticut:

- Connecticut Water Company- PURA shall approve rates that promote conservation, such rates shall consider (1) demand projections that recognize the effects of conservation, (2) implementation of metering and measures to provide timely price signals to consumers, (3) multiyear rate plans, (4) measures to reduce system water losses, and (5) alternative rate designs that promote conservation (Substitute Senate Bill No. 807).

New York:

- UW New York- Formula Rate (from interview).

2.3 Earning Sharing

New York:

- AWW New York – Earning Sharing with Dead band (Case 11-W-0200).
- UW New York- Earnings Sharing with Dead band (Survey).

2.4 Other Regulatory Mechanisms

Arizona:

- Arizona Water Company- "Low Income Ratepayer Assistance Program" and "Privatization and Excess Capacity" (Investigation 07-01-022, Decision 08-08-030, Appendix B, Low Income Ratepayer Assistance Program Issues and Rulemaking 97-10-049, Decision 00-07-018)

Delaware:

- UW Delaware- Defined Time Frames (Survey).

Idaho:

- UW Idaho- Defined Time Frames (Survey).

Massachusetts:

- Aquarion Water Company of Massachusetts - Optional formula for determining allowed rates of return on equity for water companies. ROE = 30-year T-bond + 3% if equity % between 25 and 75% and min ROE = 11.5%, max ROE = 14.5% (200 CMR 31.00 (or D.P.U. 11-43, p. 217-219).

New Jersey

- UW New Jersey – Defined time frames (Survey).

New York

- UW New York- Earnings Sharing with Dead band, Multi-Year Rate Deal and Investment Preapproved (Survey).

Pennsylvania:

- State Statute – Rate Consolidation and defined time frames (Survey).

Rhode Island:

- UW Rhode Island - Defined time frames, (Survey).

2.5 Future Test Year

Arkansas:

- State Statute: Utility may use a historical test year or a future test year consisting of 6 months historic and 6 months projected data. (Ark. Code Ann. § 23-4-406, 2008)

California:

- Valencia Water: Future Test Year (Re: Valencia Water Co., 2007 WL 2126602 (Cal. P.U.C. June 21, 2007))

Colorado:

- State Statute: Utility may use a historical test year or future test year (Colo. Rev. Stat. § 40-3-111(1) (2008)).

Florida:

- State Statute: Utility may use a historical test year or a future test year. (Fla. Admin. Code 25-30.430 (2008); Fla. Admin. Code 25-30.443(2)(c) (2008); Fla. Admin. Code 25-30.445 (2008)).

Hawaii:

- State Statute: Future test year. (Haw. Code R. 6-61).

Illinois:

- State Statute: Historic or Future Test Year (Ill. Admin. Code tit. 83 § 287.20).

Indiana:

- State Statute: Future or Hybrid Test Year (SB 560).

Kansas:

- State Statute: Historic or Future Test Year (Kan. Admin Regs. § 82-1-231).

Kentucky:

- State Statute: Historic or Future Test Year (2008 Ky. Rev. Stat. § 278.192).

Mississippi:

- State Statute: Historic or Future Test Year (Miss. Code Ann. § 77-3-37).

Nebraska:

- State Statute: Historic or Future Test Year (291 Neb. Admin. Code ch. 6 § 002).

New Mexico:

- State Statute: Historic or Future Test Year (291 Neb. Admin. Code ch. 6 § 002).

New York:

- State Statute: Historic or Future Test Year (2008 WL 4829205).

Ohio:

- State Statute: Future Test Year (Ohio Rev. Code Ann. § 4909.15C).

Pennsylvania:

- Aqua Pennsylvania - Future Test Year, (Survey).

Tennessee:

- State Statute: Historic or Future Test Year (2007 WL 4812199).

Utah:

- State Statute: Historic or Future Test Year (Utah Code Ann. § 54-4-4).

Virginia:

- State Statute: Historic or Future Test Year (20 Va. Admin Code § 5-200-30(A) (2008)).

Wisconsin:

- Clintonville Water and Electric Utilities: Historic or Future Test Year (2008 WL 1787695).

3. DSIC, CapEx Riders, and CWIP:

3.1 Distribution System Improvement Charge (DSIC)

AWW states with a DSIC (or its equivalent) Illinois, Indiana, Missouri, New Jersey, New York *i.e.* System Improvement Charge), Pennsylvania. Based on new legislation in Tennessee they too are now allowed to file for a DSIC. AWW no longer has a DSIC in California (don't think any Calif. water utility does). Although, California does allow Step Increases which can encompass DSIC type investment. New legislation also provides a mechanism for Infrastructure replacement in Maine. We are not familiar with the DSIC mechanisms listed for Rhode Island or Washington. Should heading say Companies or Utilities?

Arizona:

- Arizona Water Company- DSIC (Decision 73938 (April 8 and 11, 2013).

Connecticut:

- Connecticut Water Company- Water Infrastructure and Conservation Adjustment (WICA) (Section 16-262v and w of CGS).

Delaware:

- UW Delaware- DSIC (Survey).

Illinois:

- State Statute- Qualifying Infrastructure Plant Surcharge or "QIPS" (Administrative Code Title 83 Chapter 1 Section 656).
- Illinois American Water- DSIC (Survey).

Indiana:

- State Statute- DSIC (Indiana Administrative Code 170 IAC 6-1.1-1).
- Indiana American Water – DSIC (Survey).

Maine:

- State Statute- Infrastructure Surcharge and Capital Reserve Accounts for Water Utilities (Legislation enacted during the 2012 session (PL 2011, Chapter 602).

Missouri:

- State Statute- DSIC (NAWC).
- Missouri American Water Company- Infrastructure System Replacement Surcharge or ISRS (Survey).

North Carolina:

- State Statute - DSIC (North Carolina SESSION LAW 2013-106, House Bill 710).

New Hampshire:

- Aquarion Water Company of New Hampshire - Water Infrastructure and Conservation Adjustment Charge Pilot Program (Order No. 25,019).

New Jersey:

- UW New Jersey- DSIC (Survey).
- New Jersey American Water – DSIC (Survey).

New York:

- UW New York- DSIC (Survey).
- New York American Water – DSIC (Survey).

Ohio:

- State Statute: DSIC (Ohio Rev. Code § 4909.15(A)(1).)

Pennsylvania:

- State Statute- Allows water and wastewater utilities, natural gas distribution companies, city natural gas distribution operations, and electric distribution companies to petition the Commission for approval to implement a DSIC (Act 11 of 2012 and Docket No. M-2012-2293611).

Rhode Island:

- UW Rhode Island- DSIC (Survey).

3.2 Other Capex Riders

Massachusetts:

- Aquarion Water Company of Massachusetts - Water Infrastructure Cost Adjustment. Allows the recovery of infrastructure costs outside rate case (Survey).

New Mexico:

- EPCOR New Mexico Water, formerly New Mexico-American Water- Deep Well Surcharge allows the company to add a surcharge to rates for recovery of costs associated with deep well construction (Final Order in Case No. 11-00032-UT (New Mexico-American Water Company, Deep Well Surcharge Bi-Annual Report, dated February 29, 2012).

New York:

- AWW New York – System Improvement Charge, Case 11-W-0200, allows recovery of specific projects in rate year 2 and 3 including treatment facilities, source of supply, storage facilities and Business Transformation program.
- UW New York- Storm Recovery (Survey).

Washington:

- Marvin Road Water Company- Pass-through, (RCW 80.28.070); Water Company Funding Mechanism- permanent repairs of failed water distribution lines and emergency temporary repairs and emergency field service (WAC 480-110-455 2 a iii).

3.3 Selected Other Operating Cost Riders

California:

- Suburban Water Systems - Guidelines for the Acquisition and Mergers of Water Companies, (Rulemaking 97-10-048, Decision 99-10-064. Includes 7-Year tracker for certain specified options. See Appendix D, paragraph 3.03); Water Conservation Expenses Memorandum Account (WCEMA), Water Conservation Expense- One way Balancing Account (WCBA), Tort Litigation Memorandum Account (TLMA), PCE Litigation Memorandum Account (PCELMA), TCP Litigation Memorandum Account (TCPLMA), Stockton Litigation Memorandum Account (SLMA), Caltrans Litigation Memorandum Account (CLMA), Pension Cost Balancing Account and Balancing Account: MCBA.

Connecticut:

- Connecticut Water Company- Interim Rate Adjustments for increases than 0.5% of company's operating revenues for (1) purchased water; (2) gas or electricity if the supplier's rates have been adjusted; (3) federal, state or local taxes or revenue assessments; (4) government fees; (5) fees for mandated water quality monitoring; and (6) inflation related expenses subject to inflation adjustment (Sec 16-32c of CGS).

Delaware:

- UW Delaware- O&M (Survey).

Illinois:

- Illinois American Water- Purchased Water Rider and a Purchased Sewage Treatment Rider (Survey).

Montana:

- Mountain Water - Purchased Power Tracking Adjustment (Docket D2002.5.60, Order No. 6423b).

Massachusetts:

- Aquarion Water Company of Massachusetts – O&M (D.P.U. 11-43, p. 196).

New Jersey:

- UW New Jersey- Pension and Employment Costs, O&M Expenses (Survey).
- New Jersey American Water - Purchased Water Rider and a Purchased Sewage Treatment Rider (Survey).

New Mexico:

- EPCOR New Mexico Water, formerly New Mexico-American Water- Purchased Power Adjustment (EPCOR Rule 6.8.8.7 Purchased water and power cost adjustment clause report for quarter ended 9/30/2012); Purchased Water Adjustment (Final Order Case No. 11-00196-UT 2/24/2012).

New York:

- UW New York- O&M Expenses, Storm Recovery, Government Mandated Tax Recovery.

Oklahoma:

- Corral Creek Water District - Pass Through for Purchased Water Costs (Cause No. 200800256, Order No. 567759).

Oregon:

- State Statute – Pass-through for Purchased Water Costs (ORS 757-210b)

Tennessee:

- State Legislation- Operational Expenditure Riders (Survey).

Virginia:

- Virginia American Water: Purchased Water Rider (Survey).

3.4 CWIP

Arkansas:

- Russellville Water Company- CWIP (Docket No. U-3081, Order No. 7 Jan. 15, 1981).

Connecticut:

- State Statute- Recovery of Construction Work in Progress (CWIP) for facilities necessary to comply with the federal safe drinking water act (SDWA) and to permit affected water companies to implement a rate surcharge based on such CWIP, under specified terms and conditions (Regulations of CT State Agencies, Section 16-1-59B).

Delaware:

- UW Delaware- CWIP (from interview).

Florida:

- Alafaya Utilities- CWIP (52 Pa. Code 69.371)

Iowa:

Illinois:

- State Statute- CWIP (220 ILCS 5/9-214(e) and (f)).
- Illinois American Water Company – CWIP (Survey).

Kentucky:

- Kentucky-American Water Company- CWIP (Case 2004-00103 and Case 2004-00103 and 807 KAR 5:001, Section 10(7)(c);)
- Kentucky American Water – CWIP (Survey-).

New York:

- UW New York- CWIP (Survey).

- American Water New York- CWIP (Survey).

North Carolina:

- State Statute – CWIP (General Statute 62-133b).

New Jersey:

- UW New Jersey- CWIP (Survey).

Ohio:

- State Statute- CWIP (Ohio Rev. Code § 4909.15(A)(1).)

Oklahoma:

- Corral Creek Water District- CWIP (OAC 165:70-5-4(d)(i)(II)).

Oregon:

- State Statute – CWIP (OAR 860-037-0570)

Pennsylvania:

- State Statute – CWIP, (52 Pa. Code § 69.371).

South Carolina:

- Wild Dunes- CWIP, (Order No. 90-650)

Tennessee:

- Tennessee-American Water Company- CWIP (Docket No. 08-00039 (Jan. 13, 2009))

Texas:

- State Statute: CWIP (TWC § 13.185b).

West Virginia:

- West Virginia-American Water Company- CWIP (W. Va. C.S.R. § 150-2-19.4.d Statement B - Schedule 4 detail of CWIP and adjustments).

Wisconsin:

- Superior Water Light & Power Company- CWIP (Docket No. 5820-UR-111).

Appendix C
Summary of Water Company ARR Categories by State

	1: Revenue Stabilization	2: Comprehensive and Timely Recovery				3: Alternative Ratemaking of Capital Expenditures	
Name	1.1: Revenue True Up Decoupling	2.1: Formula Rates	2.2: Multi-Year Rate Mechanism	2.3: Earnings Sharing with Deadband	2.4: Future Test Year	3.1: DSIC (Distribution System Improvement Charge)	3.2: CWIP in Rate Base
AL							
AK							
AZ	●					●	
AR					●		●
CA	●		●		●		
CO					●		●
CT	●		●			●	●
DE						●	●
FL					●		●
GA							
HI					●		●
ID							
IL					●	●	●
IN						●	
IA							
KS					●		
KY					●		●
LA							
ME						●	●
MD							
MA		●					
MI							
MN							
MS					●		
MO						●	
MT							
NE					●		
NV	●					●	

Appendix C
Summary of Water Company ARR Categories by State (continued)

	1: Revenue Stabilization	2: Comprehensive and Timely Recovery				3: Alternative Ratemaking of Capital Expenditures	
Name	1.1: Revenue True Up Decoupling	2.1: Formula Rates	2.2: Multi-Year Rate Mechanism	1.1: Revenue True Up Decoupling	2.1: Formula Rates	2.2: Multi-Year Rate Mechanism	1.1: Revenue True Up Decoupling
NH						•	
NJ						•	•
NM					•		
NY	•	•	•	•	•	•	•
NC						•	•
ND							
OH					•	•	•
OK							•
OR							•
PA					•	•	•
RI						•	
SC							•
SD							
TN					•		•
TX							•
UT							
VT							
VA					•		
WA							
WV							•
WI							•
WY							
ON							
DC							
	5	2	3	1	16	15	21

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